

IS UTILIZATION OF UNIVERSITY-SPONSORED SOCIAL MEDIA ASSOCIATED
WITH INCREASED SOCIAL INTEGRATION AND RETENTION
AMONG ONLINE STUDENTS?

by

Gary C. Eaton

Doctoral Study Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Business Administration

Liberty University, School of Business

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Abstract

Despite the growth of online higher education, online student retention remains a problem for many colleges and universities. The seminal higher education retention models developed for residential students also explain the contribution to retention resulting from connecting online students with other students, faculty, staff, and connecting with the daily life of the university in order to create a sense of belonging and community. The difficulty for the university is that online students may live at such distances from the school that participation in on-campus activities or even a singular campus visit is impractical. Further, online students are often non-traditional students with the effect that the actions and tactics used by the residential university to evoke a sense of belonging may not work for online students. Social media has been proposed as a technology that may be deployed by the university to engage its online students and create a sense of belonging and social community that may contribute to better student retention. This quantitative study assessed the association between actual online student usage of university-sponsored social media with the Classroom and School Community Indicator (CSCI), a scale developed to quantify the online or residential students' sense of academic and social community, and the association with subsequent retention at a southeastern U.S. university with a large online student population. While the effect was small, student engagement with university-sponsored social media was significantly associated with both higher scores on the CSCI and with higher reenrollment rates.

Key words: social media, online higher education, retention, CSCI

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Dedication

This study is dedicated to Jennifer, my spouse of 27 years, who managed a household full of children, alone, for countless hours, while I studied and wrote. This degree would not have been possible without her consistent and persistent support.

Table of Contents

Abstract	ii
Dedication	iv
List of Tables	vii
List of Figures	viii
Section 1: Foundation of the Study	1
Background of the Problem	1
Problem Statement	3
Nature of the Study	4
Research Questions	6
Hypotheses	7
Theoretical Framework	7
Definition of Terms	9
Assumptions, Limitations, Delimitations	10
Significance of the Study	13
A Review of the Professional and Academic Literature	17
Transition and Summary of Section 1	50
Section 2: The Project	52
Purpose Statement	52
Role of the Researcher	52
Participants	53
Research Method and Design	53
Population and Sampling	57
Data Collection	59

Data Analysis	61
Reliability and Validity	66
Transition and Summary of Section 2	68
Section 3: Application to Professional Practice and Implications for Change	69
Overview of the Study	69
Presentation of the Findings.....	70
Research Questions and Supporting Data.....	72
Applications to Professional Practice	89
Recommendations for Action	93
Recommendations for Further Study	95
Reflections	97
Summary and Study Conclusions	98
Appendix A: Classroom and School Community Inventory	100
Appendix B: Permission to Use CSCI.....	101
References.....	102

List of Tables

Table 1	1
Table 2	5
Table 3	62
Table 4	66
Table 5	70
Table 6	71
Table 7	72
Table 8	74
Table 9	75
Table 10	76
Table 11	77
Table 12	78
Table 13	79
Table 14	80
Table 15	81
Table 16	82
Table 17	83
Table 18	84
Table 19	85
Table 20	86

List of Figures

Figure 1. Rovai's Retention Model	9
Figure 2. Tinto's Retention Model.....	21
Figure 3. Choi & Kim's Retention Model	27
Figure 4. Rovai's Retention Model (full)	31
Figure 5. Kerby's Retention Model	32
Figure 6. Rovai's Retention Model.....	55
Figure 7. Rovai's Retention Model	98

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Section 1: Foundation of the Study

Background of the Problem

While the total number of students enrolled in higher education has continued to decline between 2012 and 2016, the number of students enrolled in distance higher education continues to increase (Seaman, Allen, & Seaman, 2018). Seaman, et al. indicate the number of students taking at least one online course has grown from its base of 1.6 million in 2002 to 6.4 million in 2016. The percentage of students taking at least one distance education course also continues to grow, reaching 31.6% of all higher education students in 2016. Over the past two years, the rate of growth increased indicating the total share of students taking online courses has not plateaued.

Table 1

Students Taking Distance Courses

	2012	2013	2014	2015	2016
Distance Students	5,425,406	5,611,551	5,795,730	6,022,105	6,359,121
		+3.4%	+3.3%	+3.9%	+5.6%
Share of Total	25.9%	27.2%	28.1%	29.7%	31.6%

Higher education administration is responding to this shift. The proportion of chief academic leaders that say online learning is critical to their long-term strategy is 69.1 percent, increasing from less than 50% ten years ago (Allen & Seaman, 2013). Given the number of students and the cost of new student acquisition, online student retention is important financially

to online higher education providers (Desrochers & Hurlburt, 2016). Among academic leaders, there is a growing concern about online student retention. A total of 44.6%, versus 27.2% in 2004, of chief academic officers reported that they agreed that retaining students was a greater problem for online courses than for face-to-face courses (Allen & Seaman, 2015).

Online student retention and graduation statistics are not standardized making it difficult to compare retention and graduation of online students to residential students. This hinders the ability to accurately assess online student success factors relative to traditional, residential students. However, students at institutions where the majority of students are studying online tend to graduate at lower rates (IPEDS Data Center, 2018). For perspective, National Center for Education Statistics data show combined, residential and online, undergraduate six-year graduation rates for public higher education institutions average 59%, private, non-profit institutions average 66%, and private, for-profit average 26% (McFarland et al., 2018). Two large, non-profit universities, one in the southeastern U.S. and the other in the western U.S., with large majorities of online students report graduation rates of 49% to 51%. Similar institutions, with high ratios of online versus residential students, located in other regions report 17% to 49% six-year graduation rates. The largest, public institution providing only online degrees reported a six-year graduation rate of 25% while the largest for-profit online university reported rates averaging approximately 16% across its many campuses. Retention and graduation are influenced by course completion rates. In a study of over 300 thousand student course experiences over a multi-year period at a small, public regional university, course completion rates were found to be lower in online than in residential programs (Atchley, Wingenbach, & Akers, 2013).

Tinto's model of student retention is the most widely cited in face-to-face teaching but has also been cited in studies related to distance education (Kember, 1989). In addition to Tinto, several other models of retention in higher education (Kember, 1995; Kerby, 2015; Rovai & Downey, 2010; Rovai, Wighting, & Liu, 2005) also suggest that limited social integration, defined as interactions with faculty and other students by Tinto but expanded to family and employers by others, contributes to higher dropout rates among students. Due to physical separation from campus, online students may experience higher levels of isolation and alienation from other students and their campus. As retention models hypothesize, students who feel they do not fit in or have a low sense of community and connectedness are at a higher risk of withdrawing. In a study designed to validate a survey instrument to assess the sense of community felt by students, online students had a weaker sense of connectedness to the university than did on-campus students (Rovai, Wighting, & Lucking, 2004). One way to provide support for online students is through contact (Lehman & Conceicao, 2014).

Problem Statement

The general problem addressed by this research is the low retention of students enrolled in online higher education (Allen & Seaman, 2013; Lehman & Conceicao, 2014). The specific problem to be addressed concerns online student drop-out resulting from feelings of isolation, frustration, disconnection, and lack of social interaction (Lehman & Conceicao, 2014). Higher education models predict student interaction with other students, staff, and faculty will combat the sense of isolation and low sense of community thereby positively influencing retention among online students (Kember, 1995; Kerby, 2015; Rovai, 2003; Rovai & Downey, 2010). There are few studies examining the relationship between an online student's use of university-sponsored social media and retention or sense of belonging.

Nature of the Study

This is a quantitative study. Quantitative research tries to establish how differences in one variable are associated with differences in another (Curtis, Comiskey, & Dempsey, 2016). Correlational research establishes relationships between two or more variables in the same population or between the same variables in two populations. The purpose of correlational research is to determine the extent to which differences in one or more variables are related to differences in one or more other variables (Leedy & Ormrod, 2010). Variables can be measured directly or indirectly. Direct measures are used when the variables being investigated are tangible and accessible, such as enrollment status and social media usage in this study. Indirect measures, such as a survey, also used in this study, are used to quantify intangible variables such as attitudes about the subject of study (Curtis, et al., 2016). This study will use a validated survey instrument, the CSCI (Rovai et al., 2004), to measure students' perceptions of social integration, the sense of connection with the university and its members, and the sense of belonging as a student of the university. Students' scores on the CSCI will be correlated with the usage of university-sponsored social media during the spring, 2018 semester. Social media usage will also be correlated with retention in the subsequent fall, 2018 semester.

This study uses logistic regression. Regression may be used when the independent variables are categorical or nominal (e.g. enrolled; not enrolled), ordinal (e.g. a numerical survey score), or continuous to predict the value of the dependent variable and to determine which independent variables have significant effects on the dependent variable. Logistic regression is used when the dependent variable is nominal (e.g. enrollment status) and has two values (e.g. enrolled/not enrolled). In applications within higher education, a review of multiple studies concluded that logistic regression is superior to other methods (e.g. linear discriminant function

analysis) when the dependent variable is categorical (Peng, So, Stage, & St. John, 2002). The goal of logistic regression is to find an equation that best predicts the probability of a categorical value as a function of the independent variables (McDonald, 2014). A simple logistic equation can be expressed as taking the natural logarithm of the odds of the reenrollment equation: $\ln(Y/(1-Y)) = a + bx$. Solving for Y, the probability, yields $Y = (e^{a+bx}) / (1 + e^{a+bx})$. Additional statistical tests used are Chi-squared, Permutation, and the Mann-Whitney U (Leeper, n.d.).

Table 2

Variables and Quantitative Method

Variable	Variable	Quantitative Method
Social Media Usage	Enrollment Status	Chi-squared test Permutation test Logistic regression
Social Media Usage	CSCI Survey Score	Mann-Whitney U

Users of three university-sponsored social media channels (Facebook; Yammer Groups; Blackboard Discussions) were matched with the university's online student database for the purpose of classifying students as users or non-users. These social media channels were chosen because the university focuses its social media community-building efforts on these particular channels. Facebook is the largest social media utility in the world, and it is estimated that approximately 70% of this university's online students have a Facebook account, though this does not imply the university's online students are following or interacting with any of the university's Facebook pages. Yammer is a social media venue that accompanies Microsoft Office 365 which is provided to all online students. The university automatically enrolls students in an umbrella group *Introduce Yourself*, but students are not required to participate. Other

Yammer affinity or interest groups have to be discovered independently by the student without assistance from the university. All new, first-time online students are also enrolled in a Blackboard, non-term discussion board as a semester cohort. Like Yammer and unlike class discussion boards hosted within Blackboard, online students are not required to post or even view any discussion threads.

All current online students were administered the CSCI survey (Rovai et al., 2004) at the conclusion of the spring 2018 semester. The CSCI inventory consists of two parts (the Classroom Form; the School Form) each with 10 questions. Only the School Form was used for this study. It consists of ten questions, each followed by a five-point Likert scale of potential responses: strongly agree, agree, neutral, disagree, and strongly disagree. Scores on each item range from zero to four with higher scores reflecting a stronger sense of community. Student enrollment status for fall 2018 semesters was retrieved from the university's database.

Research Questions

The forming of relationships by university staff with online students contributes to social integration which influences retention and positions the university to remain economically viable. Students reported feeling more engaged with online faculty who “transcended” the online environment, who responded in a timely manner, and who demonstrated an active and engaging attitude. Negative factors were poor communication, non-responsiveness, and the *disappearing lecturer* (O'Shea, Stone, & Delahunty, 2015). Dana Grossman Leeman describes relationship building as creating a community: "Learning online can feel isolating. You have to engage your students in the process of community building...it's important that every class become a cohesive group and feel tethered to the program" (Biemiller, 2018, p. B16). Other social factors also play

a part in determining student retention. Enhancing social integration and student culture helps students continue with their online studies and complete their education (Bawa, 2016).

One strategy to help increase retention is...by promoting a strong sense of community.

Such a strategy has the potential to reverse feelings of isolation and, by making connections with other learners, to provide students with a larger base of academic support (Rovai, 2002, p. 12).

Bawa's work indicates this research question:

RQ1: Does engagement with the university's social media affect the likelihood that an online student will reenroll?

Social media has been proposed to be important when contemplating how to connect with online students (Clark, Fine, & Scheuer, 2017). These authors suggest the following research question:

RQ2: Does engagement with the university's social media affect the student's sense of community and belonging?

Hypotheses

H1₀: There is no relationship between students' utilization of university-sponsored social media during the spring semester and retention in the fall semester of 2018.

H2₀: There is no relationship between student's utilization of university-sponsored social media and the student's CSCI score.

Theoretical Framework

Several models of student retention exist. Rovai's (2003) online student retention model is a comprehensive model, combining elements of Tinto's (1975) and Bean and Metzger's (1985) retention models. Rovai adapts their models, based on traditional, residential students to

non-traditional students which are defined as older students living off-campus and studying part-time while working full time. Rovai also incorporates Workman and Stenard's (1996) model which identified additional, specialized needs of online students. Rovai emphasizes the difficulty in establishing a sense of community or belonging among non-traditional and online students when, he claims, these students are mainly interested in the institution's academic offerings and are not greatly influenced by on-campus social integration mechanisms due to their distance from campus.

Rovai (2003) classifies factors impacting retention as those prior-to-admission and those after admission. Factors prior-to-admission include student characteristics; demographics (age, gender, social-economic); academic preparation and performance; and intellectual development. Other prior-to-admission factors are student skills including computer literacy, time management, and writing. Rovai sub-characterizes *after admission* influencing factors as external or internal. External factors include employment and family responsibilities. Internal factors (deriving mainly from Workman and Stenard's 1996 model) include self-esteem, the need to identify with the school (i.e. to not feel like outsiders), social integration (i.e. communication with other students and faculty), and access to support services. Rovai claims internal factors are influenced or under the control of the institution.

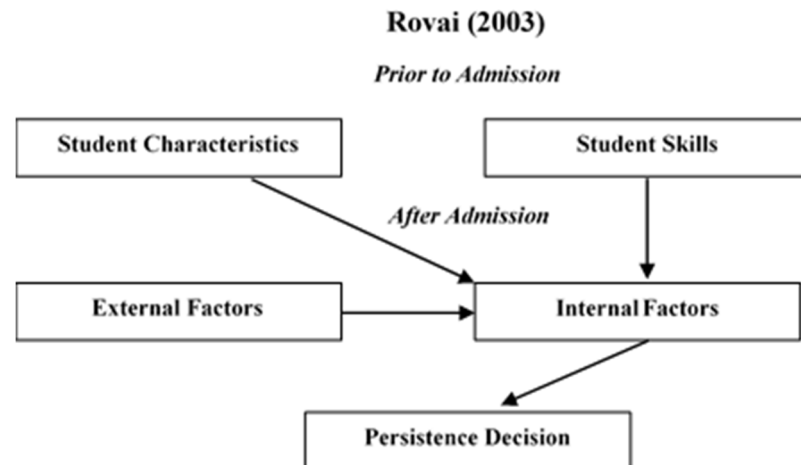


Figure 1. Rovai's Retention Model

This study attempts to determine if institution-sponsored social media can provide or influence some of these internal factors. Second, regardless of whether the student reports feelings of integration or connection to the school or other students, this study attempts to determine if institution-sponsored social media is associated with subsequent enrollment.

Definition of Terms

Enrollment status. The student is considered enrolled when taking at least one online course in the spring 2018 semester. The student is considered retained when registered for at least one course in the fall 2018 semester.

Sense of community. School community represents the feelings of students regarding their spirit, cohesion, trust, safety, trade, interdependence, and sense of belonging. Learning community...consists of the feelings...regarding the degree to which they share group norms and values and the extent to which their educational goals and expectations are satisfied...communities do not necessarily require geographical proximity (Rovai et al., 2004, p. 267).

Spirit is the feeling of belonging and membership. Trust means members are willing to rely on other members of the community. Quality socio-emotional interaction (contrasted with class project working groups) is the third component, and common expectations – for higher education, a desire to learn or acquire new skills – is the fourth (Rovai, 2003).

Social media. Social media are online communications among interconnected and interdependent networks of people, communities and organizations. Social media users connect through the internet using social media utilities, such as Facebook, Twitter, YouTube and LinkedIn. In commercial applications (such as advertising or public relations), social media differs from traditional media (e.g. newspapers; television; mail) in that the flow of communication can be two-way with content originating from anyone in the network versus one-way, vertical-only with content originating at the organization (Tuten & Soloman, 2015).

Social integration. Social integration is defined as the interaction between an individual with given sets of characteristics (backgrounds, values, commitments, etc.), and other persons of varying characteristics within the college (Tinto, 1975). Students see potential to use social media in higher education because it aligns with their desire to seek out conversations and be interactive with faculty and other students (Neier & Zayer, 2015).

Assumptions, Limitations, Delimitations

Assumptions. Students completing their degree after the spring or summer semesters, or expecting to graduate before the end of 2019 are expected to have a stronger sense of belonging and to be more socially connected simply from being a student for more semesters. Those not graduating, but near the end of their program, will be more likely to be retained in the fall 2018 semester. These biases will be controlled for in the study's design by removing them.

Delimitations. This study has several limitations.

Single institution. Data were collected only from online students of a single, private, non-profit, Christian institution of higher education in the mid-Atlantic. This limits the ability to project findings to other online institutions (for-profits; in other geographies; secular-private; public).

Military-associated students. A relatively high number of students were active members of the U.S. military. Military-associated students may have different habits concerning the use of social media, attitudes about a sense of community with the institution, ability to pay, or ability and motivation to reenroll. This limits the ability to project findings from this study to other institutions with more or fewer military students.

Unobserved communication channels. The study examines only a few of the communication channels, social media and others, that might create or foster feelings of engagement or sense of belonging and promote retention. It did not consider other means of social integration such as contact with professors or with academic advisors.

Unrecorded social media lurking. From the social media channel data that were available for this study (Yammer; Blackboard; Facebook), only instances of *posting*, *responding* to another's post, or *liking* a post were recorded as engagement events. *Reading* a post but not responding in any way, also known as lurking, was not able to be recorded as an engagement event though it has been shown to significantly improve the odds of reenrollment in another study (Fagioli, Rios-Aguilar, & Deil-Amen, 2015).

Student proximity. Many of this institution's online students reside near the university and may have visited campus for extracurricular academic, athletic, or cultural events. These potentially social integrating activities were not considered as there were no accurate methods to quantify participation. Face-to-face or in-person experiences with staff, faculty or other students

may induce a higher sense of belonging than that induced solely through social media causing a higher CSCI score or retention rate.

Former residential students. Online students may have been residential students for all or part of an undergraduate or graduate program. The residential experience, whether good or bad, would influence the student's responses to the CSCI survey. It also might influence the student's ability and willingness to persist to a subsequent semester. It would be impossible to differentiate between a sense of belonging due to the online student experience from one that originated from a residential experience.

Short study length. The timeframe over which data were collected is short compared to the average total time typically elapsing between matriculation and graduation. Students were surveyed after the spring semester of 2018, and their retention was assessed for the fall 2018 semester which began only weeks after the conclusion of the survey process. Overall enrollment data were collected for the spring semester and the fall semester of 2018. Correlation between improved retention, use of social media, and social integration may not appear over such a short period.

Study timing. This study examines online students from the spring 2018 semester. Examining only a single semester will limit the ability to project findings to all other semesters. Examining only a spring semester will also limit the ability to project findings, especially to fall semesters, the common semester for first-time students to begin online studies. Students in a spring semester may be more likely to be retained as they are likely to have been enrolled in the preceding fall semester, therefore having been retained at least once previously.

No control groups. Both datasets of this study lack control groups of online students who did not participate in social media. Online enrollment in higher education has been increasing in

the U.S. without any known influence or emphasis from social media. This study's focus on social media and its relationship to retention and the sense of belonging/community will not be able to determine if social media use causes or influences CSCI scores or retention.

Convenience sample. The survey dataset consists of online students during the spring 2018 semester who responded to an email invitation to complete an online survey. The group of students who had decided by the time of the survey to not return in the fall may have been more likely to not complete the survey. These students' sense of belonging/community, measured by the CSCI, or reason for not returning in the fall semesters will not be known. With the reasonable assumption that students who were not retained and who also did not complete the survey would have lower CSCI scores, the median scores of those who completed the survey, whether retained or not, might exhibit smaller differences in their median score.

Significance of the Study

The significance of this study is to test whether university-sponsored social media has a positive association with online students' feelings of connection to the university and with subsequent retention. Social media managers have sparse evidence that social media is achieving the results they intend. Students who drop out of online programs fail to achieve their educational goals and may fail to achieve subsequent life goals as a result.

Given the wide penetration of social media, the communication channel may represent an opportunity for universities to connect with and influence online students. Social media represents a cost-effective communication channel for the university to engage with large numbers of students who may be widely dispersed. Social media, versus traditional media such as mail, also has the unique capability to engage not just vertically between the university and

students, but horizontally, student-to-student, which may increase perceptions of believability and the impact of the content.

Facebook, the first social media platform to exceed 1 billion users, now has over 2.2 billion monthly users (Number of monthly active Facebook users worldwide, 2018). Spending on social media has also increased by 130% since 2014 to \$17.3 billion in 2017 (Social media marketing expenditure in the United States, 2018). Firm-sponsored content delivered through social media has been found to have a significant, positive effect on customers, with a stronger effect among tech-savvy, social media-prone consumers (Kumar, Bezawada, Rishika, Janakiraman, & Kannan, 2016). However, few studies exist showing the impact of institutionally-generated social media on the buying behavior of online higher education students (Brech, Messer, Vander Schee, Rauschnabel, & Ivens, 2017). Across the U.S., 77% of the population had a social media profile in 2018, a 3% decrease versus the previous year and the first decrease since tracking began in 2008. Overall social media reach in the U.S. may have reached saturation. The top three social media channels used by teenagers and young adults are Snapchat (79%), Facebook (76%) and Instagram (73%) (Reach of leading social media used by teenagers and young adults in the U.S., 2017). Among all U.S. adults, 68% use Facebook and 73% use YouTube (Murnane, 2018). In addition to Facebook, this study will examine two in-house social media channels: Blackboard's non-term discussion boards and Yammer Groups. University social media managers can more easily control content on internal social media channels and can better study these internal channels, compared to external social media channels which make it difficult or impossible to identify university page fans or followers. When granular usage data are available, such as from internal social media channels, social media managers would be able to adjust content and tactics to maximize their impact.

Implications for Biblical integration. Fellowship among Believers and Christian community are prominent Biblical themes. The Greek word *koinōnia* is translated several ways in the New Testament: participation; partnership; sharing; fellowship. Online students, though often dispersed geographically, may still join their academic community using social media.

The first Christians in Acts 2 were not simply engaging in social activities, but in relationships (Bridges, 2012). The apostle John urges fellowship when he writes “we proclaim to you what we have seen and heard, so that you also may have fellowship with us. And our fellowship is with the Father and with his Son, Jesus Christ” (1 John 1:3, New International Version). In his first letter to the Thessalonians, Paul exhorts believers to encourage and build one another up (1 Thessalonians 5:11), and in Romans he commands “rejoice with those who rejoice and weep with those who weep” (Romans 12:15, English Standard Version), implying a more-than-casual relationship was to be established. In his first letter to the Corinthians, Paul states “if one member suffers, all suffer together; If one member is honored, all rejoice together” (1 Corinthians 12:26, English Standard Version). The author of Hebrews writes “and let us consider how to stir one another up to love and good works” (Hebrews 10:24, English Standard Version). Social media, as a modern communication channel, may already be or may become a component of living in community, as it may be used to encourage and support online higher education students.

While all universities may benefit from the community-building potential of social media, social media may also enable the Christian university to support spiritual development among its online students, an objective unique to many Christian institutions of higher education. “The Internet has become a significant purveyor of spiritual development resources for Christians of all traditions” (Shirley, 2017, p. 377). Grey Matter Consulting (2012) found that

among adults with internet, nearly half of all adults, and 57% of those under the age of 35 already use the internet for religious purposes. Although the primary venue for the Christian online student to engage with other Christians is the local church, social media, such as blogs by campus pastors, the publishing of daily devotions, digital forums for prayer requests, and recorded convocations can help dispersed online students connect with other students, staff and faculty about spiritual matters. Christian university-sponsored social media may also be encountered by unbelievers, possibly spreading the Gospel and furthering The Great Commission. Social media content by Christians may also draw unbelievers to Christ by demonstrating how differently believers treat each in contrast with how people are treated in secular social media by internet trolls and cyber bullies (Gan, Zhong, Gan, Willis, & Tully, 2013; Ramsden, 2017; Watts, Wagner, Velasquez, & Behrens, 2017).

Relationship to field of study. Many universities have embraced social media marketing for both student acquisition and retention though there is little empirical evidence to guide social media marketing investment decisions as part of the overall marketing mix (Brech et al., 2017). This study will add to the existing literature by examining whether there is any positive association between student consumption of university-sponsored social media and the student's sense of connection to the university, and between social media consumption and the likelihood that the student will be retained in a subsequent term.

Summary of the significance of the study. Social media as a marketing channel has become a major means of communication with potential and current customers (Social media marketing expenditure in the United States, 2018). Firm-generated content (FGC) social media marketing has been effective in other commercial categories, particularly high involvement purchase decisions, and it could be argued that higher education is such a decision (Wan & Ren,

2017). In the most recent Chief Marketing Officer Survey (Moorman, 2017), marketing executives reported spending 11% of marketing budgets on social media and expected this to grow to 19% within five years.

As a category of communication with potential or current stakeholders, social media is still in its infancy, and 44% of CMOs believe the impact of social media is minimal or nonexistent. Marketers' attitudes toward social media and its prominence in the marketing mix are expected to change as more experience is gained. In higher education, interactive social media has been shown to have a positive effect on student recruitment (Rutter, Roper, & Lettice, 2016). This study attempts to determine if university-sponsored, interactive social media is positively associated with student perceptions of the university and a sense of belonging/community, and is positively associated with higher retention of online students.

A Review of the Professional and Academic Literature

Online higher education. For 14 consecutive years, the number of students in online higher education has grown. Residential-only enrollment has recently flattened, partially because more residential students have taken at least one online course. In the U.S., the online student population reached over six million students in the 2015-2016 academic year, approximately 28% of all post-secondary students (Seaman, Allen, & Seaman, 2018). This persistent growth and the currently large fraction of higher education students studying online indicate online higher education is meeting the needs of many students.

In approximately 5500 institutions reporting statistics for all types of undergraduate students (full-time; part-time; online; on-campus; mixture of both), 59% of first-time college students completed degrees within six years, though graduation rates differ significantly by type of institution. For example, selective admissions institutions (those accepting less than 25% of

applicants) reported graduation rates of over 90% while open admissions institutions and for-profit institutions reported graduation rates 30% to 50% lower. Low graduation rates begin with low year-to-year retention of first-time students. From fall 2015 to fall 2016, a combined (online and on-campus) 46% of part-time and 76% of full-time students returned the following fall (IPEDS Data Center, 2018).

Unlike residential higher education, standardized nationwide graduation and retention statistics for students exclusively or primarily enrolled in online courses and programs are not available, nor are there readily available data comparing for-profit with non-profit institutions (Carr, 2000). Statistics for selected individual institutions with high ratios of online to residential students are available for the 2015-2016 academic year. One institution with a large percentage of online students reported a 39% year-to-year retention for first-time students, a 55% baccalaureate graduation rate within eight years, and a 21% transfer-out rate. In one recent academic year, the large, for-profit provider of online higher education in the U.S. reported a 0% year-to-year retention rate for part-time and 31% for full-time students, and an eight-year graduation rate of 12%. Another large provider of online higher education reported a 29% part-time student retention rate, a 50% full-time retention rate, and a 20% eight-year graduation rate (IPEDS Data Center, 2018).

There is additional evidence from both individual institutions and nationally reported statistics showing online course and program completion is lower than for comparable residential programs (Rovai & Downey, 2010). Carr (2000) asserts that low retention is partially the result of low course completion rates, and reported that on-campus course completion rates were often 10 to 20 percentage points higher than distance learning courses. Carr cautions against direct comparisons of retention rates between institutions because the definition and measurement vary

from institution to institution. One reason online retention rates appear to be lower than residential programs is that online programs tend to attract non-traditional students, and non-traditional students are less likely to graduate, regardless of studying online or on-campus (IPEDS Data Center, 2018).

Low retention rates of all types of students make a significant, negative economic impact upon colleges and universities. One study estimates the annual loss to U.S. institutions to be over \$9 billion (Schneider, 2010) while a more recent study by Raisman (2013) estimated that, in only 1,669 higher education institutions, over \$16.5 billion in revenue from tuition, housing, and fees was lost annually.

Foundational theories of retention.

Spady. Before Spady (1971), the study of student retention was focused on describing the observable or quantifiable profile of the student most likely to drop out. Spady advanced student retention thinking by framing retention failures as the *culmination of a student decision-making process*. Describing the university as a complex social system, Spady proposed that the decision to leave was also complex, and factored in family support, educational background, subjective self-assessment of academic potential, one's sense of fit with the particular institution, support from friends, intellectual development and subsequent GPAs, and social integration, which he meant to be participating in the "life of the university" combined with overall satisfaction and commitment to the university. Over the short-term, Spady thought academic progress plus a broad sense of satisfaction with the overall college experience, this driven by interpersonal relationships and commitment to the school, determined student retention. Over the entire four-year college period, Spady believed that poor academic performance was the most important factor in the dropout decision.

Tinto. Tinto (1975) thought earlier retention research “lumped together” the various attrition events when instead they should be considered as entirely different in character. For example, he said leaving due to academic failure is not equivalent to a voluntary withdrawal. Like Spady (1971), he also believed there was an inadequate understanding of the student’s thinking process and of the interactions over time that result in the decision to leave. He termed earlier research “descriptive,” not “prescriptive.” He states, “... knowing, for instance, to what degree an individual's measured ability and social status relate to the probability of his leaving college does not mean knowing how these attributes affect the process of dropping out from college” (p. 90). He affirms that an individual’s background, individual characteristics and precollege experiences influence expectations about the college experience and will, directly and indirectly, affect performance and retention in college. Tinto (1975) writes:

Given individual characteristics, prior experiences, and commitments, the model argues that it is the individual's integration into the academic and social systems of the college that most directly relates to his continuance in that college... the higher the degree of integration of the individual into the college systems, the greater will be his commitment to the specific institution and to the goal of college completion. (p. 96)

Theory of suicide. Tinto’s (1975), and to some degree Spady’s (1971) models derive from Durkheim’s 1897 theory of suicide (Lester, 2000). According to Durkheim, the person likely to commit suicide has been inadequately integrated into the *fabric of society*. The person who commits suicide holds values and beliefs that diverge from those held by society at-large and are the result of a failure to integrate with other members of the society. Tinto saw college as having its own social, value and belief systems: a society in itself. Therefore, the analysis of

drop-out within this narrowly defined social system can be examined in the same manner as suicide is analyzed in society overall.

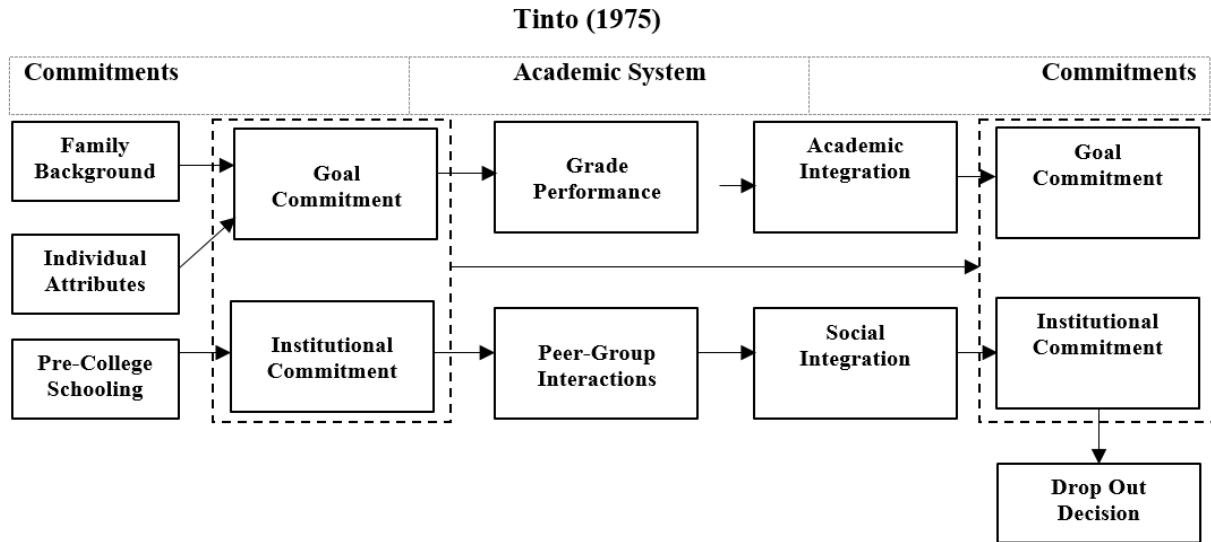


Figure 2. Tinto's Retention Model

Drop-out process. Student attitudes are not static. The student's dropout decision is a longitudinal process, affected by his or her starting position (family background; motivation; academic preparation), but the decision process continues to develop during the actual college experience, and is, according to Tinto (1975) the more impactful component of the persistence decision. The student's goal of academic success and his or her commitment to the university (upon matriculation) change over time and can result in the various reasons for retention failure at a particular college. Either low goal commitment or low integration and commitment to the university can lead to the drop out decision for that school. For example, the highly motivated student with a low commitment to the institution may transfer to another institution. Another with low goal commitment but who is highly integrated to the university may choose to "stick it out," (at least until forced to leave due to academic failure). Or, the student might barely

maintain passing grades due to non-academic support and integration, leading eventually to a degree.

Personality and integration effects. Personality also affects persistence (Tinto, 1975). Social integration is influenced by the student's personality, specifically, the ability to become socially integrated or develop feelings of connection to the university. Tinto notes that academically successful students who voluntarily withdraw from college score lower on measures of social integration than students who persist, and also lower than those who withdraw for academic reasons. However, too much social integration, to the point it detracts from studies (e.g. dating excessively), can contribute to poor academic performance. Social integration success also depends on the type of person with which the student connects. Association with "disinclined, underachievers" has a negative effect on retention. Spending too much social time with those less inclined to excel academically partially explains lower retention. Tinto states that an individual's level of institutional commitment, given the individual has sufficient goal commitment, has a large effect on the decision to transfer to another institution. Academically successful students with low social and institutional integration are more likely to transfer out and complete their degree elsewhere.

Social integration has multiple dimensions (Tinto, 1975). Tinto defines *social integration* as interaction and "the degree of congruency" (p. 107) with other individuals and with the institution itself. Social integration occurs when students interact with other students, participate in school events, or interact with professors or staff. Friendships with other students, faculty and staff, support from other students, faculty and staff, and what he terms *collective affiliation* with the university, all contribute to the student's retention decision. Tinto states, "All things being

equal, social integration should increase the likelihood that the person will remain in college” (p. 107).

Even students who are outside the norm in terms of social behavior for a particular university can become socially integrated if they can find like-minded students with which to affiliate. Social integration need not be with wide-ranging (across all levels: other students; faculty; staff) as long as the student connects with a sub-culture of the university. In a study testing Tinto’s scales, Pascarella and Terenzini (1980) confirmed, at least for student-to-faculty social integration events, the quality and quantity, both formal (i.e. classroom) and informal (office hours or hallway conversations) had a strong positive effect on freshmen persistence.

Tinto (1975) claims social and academic integration is also affected by other intrinsic and extrinsic factors. For example, a student’s perception of the value of a particular degree, the personal satisfaction in attaining a degree, the pride of graduating from a particular university, or gaining new friends may outweigh the cost of tuition, the time spent studying, or the potential use of time to pursue other goals. Tinto concludes that, of the various sources of social integration, peer-group relationships seem to be most important to individual social integration, while activities and faculty interactions are of equal and secondary importance in forming a commitment to the university. He claims, that at any given level of an individual student’s commitment to an academic goal, it is this institutional commitment that has the most positive effect on retention. With sufficiently high levels of goal commitment, it is the level of commitment to the institution that determines whether the student continues with the university or transfers to another. With low levels of goal commitment, institutional commitment determines whether the student persists or drops out.

Limitations of Tinto's model. Tinto's (1975) retention model, the most prominent model for higher education retention, was developed for the traditional college student: a recent high school graduate who attends full-time and lives on-campus. The student socializes on campus, and student-student, student-faculty, and student-institution interactions are the most important factors or sources of social integration. Bean and Metzner (1985) advanced Tinto's model by focusing on non-traditional students, defined as older than 24, living off-campus, and attending part-time while usually working full-time. Compared to the traditional student, they believe the non-traditional student is concerned mainly with the academic offerings (i.e. courses; certifications; degrees) of the institution and is less influenced by the social environment of the institution. Socialization (social integration) is still important to the retention process and decision, but instead of being influenced by the campus' students, faculty and staff, they state that the non-collegiate social environment (i.e. work associates; family; friends) is the main influencer.

Kember. Kember's (1995) model for adult learners studying at a distance furthered the understanding of retention of non-traditional students. It built on earlier models (Bean & Metzner, 1985; Spady, 1971; Tinto, 1975) including his own (1989), and consisted of four elements: entry characteristics; academic integration/incompatibility; social integration; and external attribution. Like the earlier models, Kember incorporates demographic characteristics (age; number of children; housing conditions; gender; sponsorship; region of residence), in his retention model while acknowledging they explain only a small fraction of the variance in retention.

Student characteristics were shown to have a degree of explanatory value by influencing the way the student interacts with the college environment (Kember, 1989).

Though having low predictive value, Kember concludes they are still useful to identify what types of students are more at-risk, thus enabling the university to take appropriate preemptive actions, such as, for example, counseling. Kember acknowledges that, while statistically significant in large samples, the absolute differences of the predictive variables can be small, and even if the differences are meaningful, it may be impractical or illegal for the university to do anything about them. For example, female distance learners tend to have better retention than males, but it would be likely illegal to only admit females. Kember concludes that at best, student entry characteristics may be useful to predict how the student will react to other elements of the model, particularly academic integration, but that by themselves, entry characteristics are not good predictors of persistence. In contrast, Park and Choi (2009) demonstrated that in adults, student characteristics such as age, gender, and educational level had no direct effect on the drop-out decision. They acknowledged that some previous studies claimed significant effects while others claimed student characteristic had only minor or indirect effects. Choi and Kim (2018) confirm, that in online students, factors such as age, gender, educational level, and employment status were not significant predictors, corroborating Park and Choi's findings.

Kember and distance students. Academic integration components include all facets of the academic offerings, including interaction with assignments, tutoring, the course materials, and any other interaction between the student and the institution, and can be influenced by the university (Kember, 1995). The academic integration or incompatibility element relates to “the degree to which the student is able to empathize with this academic environment and to accommodate the demands of the university or college (p. 100). Goal commitment (i.e. motivation) has both intrinsic and extrinsic components. Intrinsic goal commitment is the

student's interest in the subject. Extrinsic goal commitment describes the student's interest in obtaining the degree or qualification for what it might gain him or her. Kember states that those with the strongest belief that the new degree would lead to advancement and better-paying jobs tended to persist better. Unrealistic goals, often resulting from an unrealistic self-assessment of academic ability, had a negative effect on retention. Kember points out that research on full-time students' goal commitment applies to non-traditional students too, but noted that distance students are also known to enroll in courses to gain specific knowledge. They may never have had the intention to complete a degree, yet they will show up in retention statistics negatively. Of the two components, Kember claims intrinsic motivation is more important to the adult distance learner's success. Another study among 1609 adult female online learners (Kim & Park, 2015) showed internal motivation to be the highest contributing success factor. Choi and Kim (2018) found that online students who had poor GPAs, less interaction with the course content (low academic engagement), few quality interactions with instructors, and overall low levels of satisfaction had higher dropout levels.

Kember's (1995) external attribution relates to factors beyond (or believed by the student to be beyond) the student's control. For example, students commonly cite the lack of time as the reason for dropping out. Factors may also be unexpected events such as family illnesses or loss of job, financial pressures, and distractions such as social pressures from friends or even problems arising from a lack of dedicated study space. He states that because most online students study part-time, over the longer period of time required to attain a degree it is common for students to encounter an unexpected event with the potential to derail progress. Park and Choi (2009) also showed external factors that are beyond the control of the university impact persistence and showed factors such as degrees of family or organizational

support were significantly different for dropouts versus students who persisted. Choi and Kim (2018) also found external factors exert influence on the drop out decision for online students including constraints resulting from family, work or personal circumstances.

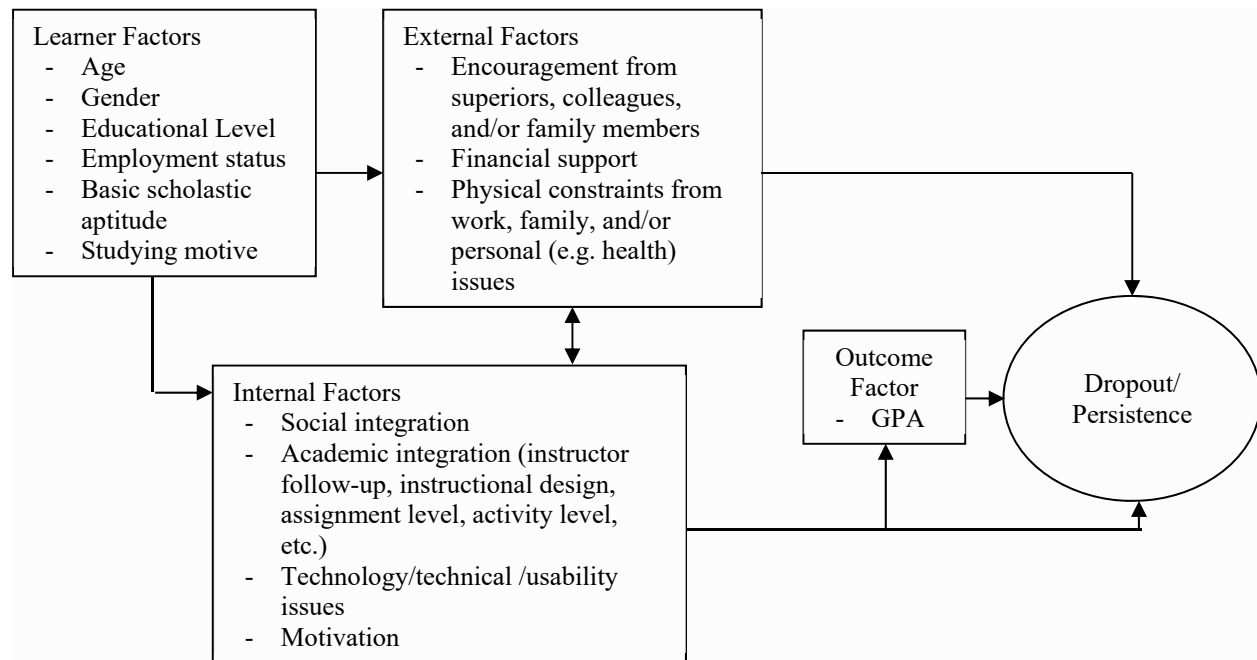


Figure 3. Choi & Kim's Retention Model

Although the university cannot control or even influence these external factors Choi and Kim (2018) said course design and academic policies could help keep students engaged, permit course administrators flexibility to accommodate external factors or point the students to help provided by the university. They also suggest that good course design and description could help the learner gain support on the home front by connecting academic success to family objectives. Students who could not directly relate the course content to practical purposes and application to their real lives were more likely to dropout.

Online students are often part-time students with full-time jobs. Many have families to support and these responsibilities must be accommodated into a new lifestyle if the student is to persist to graduation (Kember, 1995). Kember's definition of social integration has less to

do with integration with other students and faculty. Instead, his model focuses on the student's family, friends and employer. Kember's *social fabric* for the distance student includes his or her ability to integrate a job with family responsibilities and social commitments. He examines how the family or employer might affect the enrollment decision and subsequent continuation. For example, if the employer and family are encouraging, the student enters studies with confidence and a positive frame of mind. Supportive employers or family members may also be more accommodating when difficulties are later encountered. Friends and employers are positioned to have a positive social integration effect when friends are also studying or when courses are directly related to his or her employment. Family support in a social integration paradigm relates to balancing the use of time between studies and family. Family members also make sacrifices and can result in negative support with a subsequent higher likelihood of dropout. Kember (1995) states that non-traditional distance learners spend little if any time on campus and have little opportunity for social interaction with other students, so the scales used by Tinto (1975), which measured student-to-student and student-to-faculty interactions would have little relevance to an online student. Further, the part-time status of most online students implies that the local external influencers will have more importance as the adult, part-time learner cannot remove themselves from their environment to start over in the college environment. These students do not separate from an existing lifestyle as does the residential student. Versus Tinto's model of residential, full-time students, part-time, online learners naturally have less collective affiliation with the university, with other students and with professors. Because the student still has an association with everything in their current life before beginning studies, there is also less felt need to assimilate to the new environment. Institution integration or affiliation can still be established through media channels, but it is not

as easy as when there is direct, face-to-face contact. Kember states that the university should attempt to create a sense of belonging between the student and the organization but that it is difficult since most or all of the online student's study is from a distance. A sense of belonging tends to develop naturally as the traditional student progresses but online students move through programs often without direct contact.

Kember disputed. Kember (1995) concludes that the four key constructs (social integration; academic integration; external attribution; academic incompatibility) account for 80% of the variance in adult student persistence though, in a later study, these results were not replicated. Woodley, de Lange, and Tanewski (2001) test Kember's 1995 model of student progress using the Distance Education Student Progress (DESP), an inventory devised and used by Kember. This inventory consists of 67 single line statements that generated 15 sub-scales that in turn produce the four constructs of the model. They found only five of the sub-scales achieved a Cronbach's alpha of 0.70 or higher, which they assert is the cutoff for reliability coefficients in order to determine differences between groups. In Kember's study, only two of the scales met this standard, consequently, they claim the DESP suffers from excessive measurement error, and that further refinement is necessary before one could claim internal reliability and generalizability. They ultimately conclude that though their study disagrees with Kember's work, they agree with Kember's statements that attrition is a complex phenomenon, particularly in open and distance learning. In Kember's 1995 paper, he writes a detailed catalogue of proposals to mitigate the odds of attrition, and they concur that all of these counter-actions are sensible and fit with their qualitative data.

Rovai and Kerby. Rovai (2003) uses Tinto's (1975) "social integration" interchangeably with sense of community, relationships, interactions, and sense of belonging.

In this paper, he focuses on online students and the unique factors affecting them after admission and puts forth pragmatic options for the university. The first student need he identifies is for consistency and clarity of online programs, policies and procedures. Face-to-face academic counselling is impractical for most online students, so call centers with trained agents are widely used. Rovai's point is that information that is subject to human error is counterproductive. Instead, he urges a well-organized online library or e-learning system with simple access and navigation, and with sufficient detail that can better provide students with the information they need. Rovai also emphasizes the need to make contact information easily found for instructors, advisers and support technicians (such as library research assistance or IT help desks) and urges a quick response to student emails or at least acknowledgement of receipt of the email and a promise of when a response should be expected.

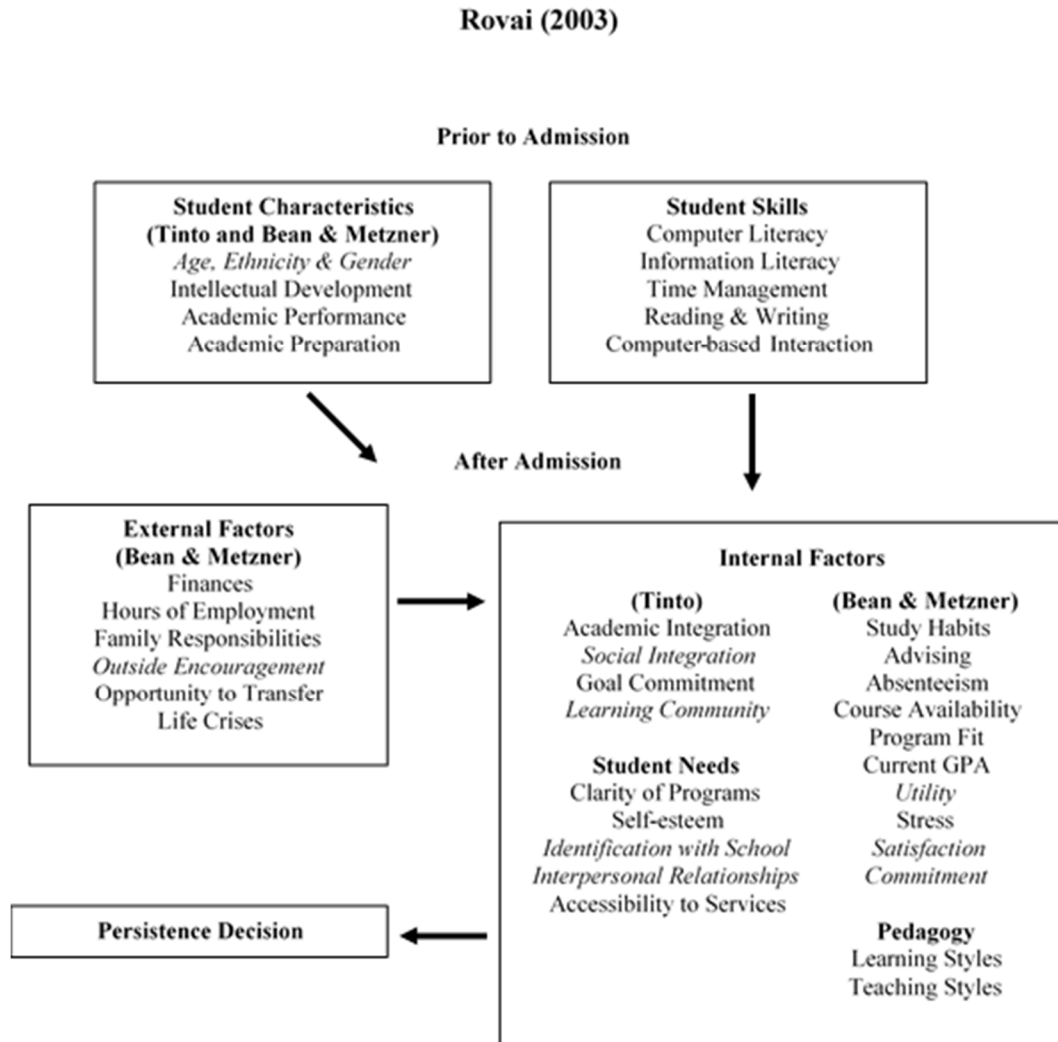


Figure 4. Rovai's Retention Model (full)

The second need of the online distance learner is to develop a sense of self-esteem. Rovai (2003) suggests using initiation courses that make the student familiar with the technology and online tools used in the program's courses. Explicit descriptions of learning objectives and grading criteria are also critical to meeting this need. Third, is the need to feel a sense of identity with the school to ensure online students do not feel like outsiders. Tinto (1973) describes this same sense of identity as *institutional commitment*. Fourth, online students require social integration, meaning they need relationships with peers, faculty and staff. This need also falls under Tinto's model of social integration/sense of community. Fifth,

online students need access to support resources such as tutoring, study skill training, research assistance from the library, and orientation on the technology used in course delivery. Rovai suggests requiring an on-campus course at the start of a student's program to speed the development of institutional commitment, and so that students can meet face-to-face and begin relationships that can continue online.

Kerby (2015) builds on the retention models of Spady (1971) and Tinto (1975). She states that students' experiences result from the group's values, morals, customs and beliefs, and less from personal or individual contribution. To Kerby, the university is an integrated community with its own set of cultural norms, values, and beliefs, and institutional climate.

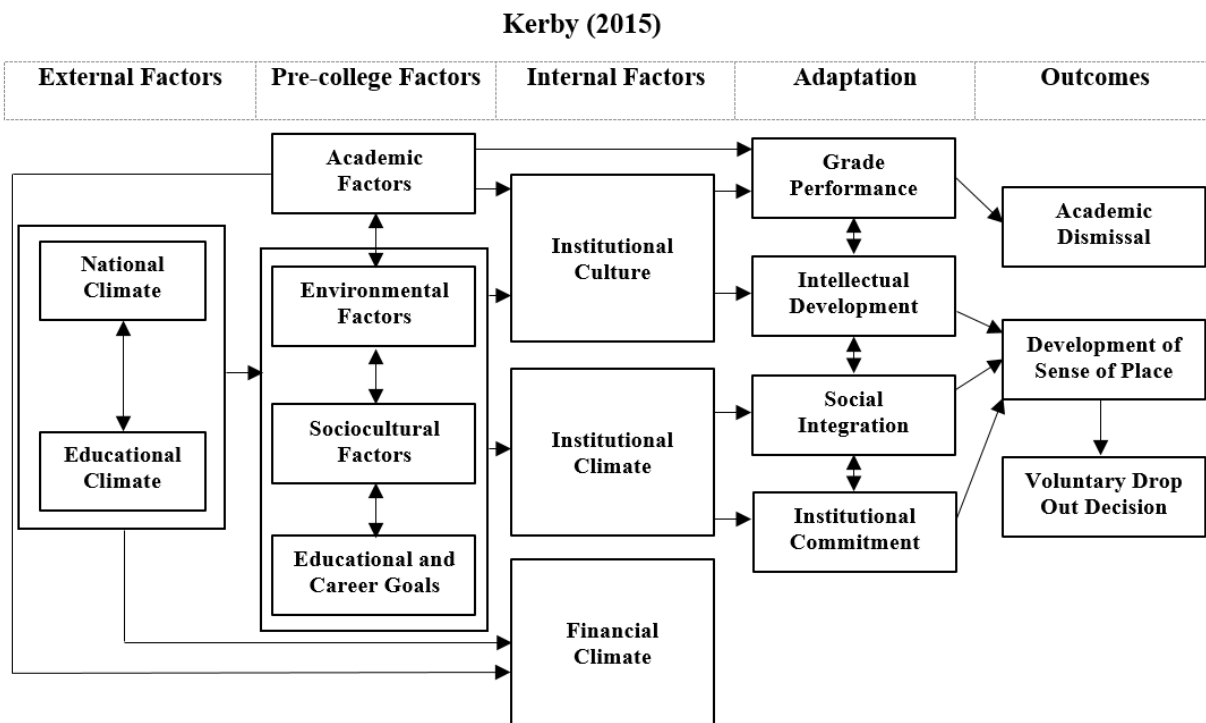


Figure 5. Kerby's Retention Model

“The university is a society within itself in which socialization, belonging, and unity are vital parts of the institutional culture and affect student persistence in higher education” (p. 143).

She indicates the university should undertake a deliberate strategy to transfer its ideals to

students rather than passively hoping its values somehow rub off to new students, but notes the difficulty in passively influencing distance students. Kerby also references Durkheim's (Lester, 2000) theories of suicide: Societies that force individuals to rely on personal resources rather than group resources for support tend to have higher rates of suicide. Kerby asserts constructing an academic system of mutual dependence among students would have a positive effect on retention. Outside of group projects, study groups, and student tutoring, it is not clear how actionable this advice is. Kerby reinforces the need to build community among students and to cultivate a sense of place resulting from the combination of intellectual development, social integration, and institutional commitment. The sense of place becomes the final dropout decision point for the student contemplating voluntary withdrawal. Again, she feels it is not clear that a sense of place can be deliberately and reliably constructed for the average online student who is unlikely to ever visit campus.

Post-admission factors. Across the various retention models, social integration is a function of interaction with peers, staff, and faculty, and with the student's involvement in the life of the university. The lack of sense of community and feeling of connectedness, terms used interchangeably with social integration, are associated with higher dropout rates. Although all forms of interaction seem to contribute to a sense of connectedness or community, a lack of interaction with instructors or other students leads to feelings of isolation and decreased engagement in online courses (Bowers & Kuman, 2015). Tinto (1975) studied residential students but his theories of engagement and social integration have been applied to non-traditional students as well (Karp & Hughes, 2010). Several retention decision factors from Rovai's (2003) composite retention model may be able to be influenced by social media and result in social integration of the online student, though in online higher education, Rovai's

factors may not be observable behaviors. For example, it is not expected that commitment can be directly observed, for example, by noting attendance at university events, in the online student given the physical distance. However, the sense of commitment can be assessed via a survey. This section discusses Rovai's retention decision factors that may be influenced by a university-led social media effort, in effect, describing the mode-of-action that social media might take toward ultimately influencing retention.

Sense of belonging. A sense of belonging is a basic human need and motivation. In Maslow's (1943) Theory of Human Motivation, the sense of belonging becomes important after basic physiological and safety needs are first met. "If both the physiological and the safety needs are fairly well gratified, then there will emerge...belongingness needs... he will hunger...for a place in his group" (p. 380-381). Strayhorn (2012) writes that in college students, belonging is achieved through establishing relationships. The student feels a sense of belonging to a group as a result of forming a relationship with members of the group and the group itself. Ideally, he says, in order to have a sense of belonging, members will feel both that the group is important to them and they are important to the group. Strayhorn (2016) also states that a sense of belonging is closely related to a sense of community, a sense of membership, and a sense of being accepted, valued, and encouraged by peers and teachers. Students who find a sense of belonging "...thrive, flourish and persist, since quitting or dropping out would require severance of the social ties that bind them" (p. 45). Strayhorn claims this lack of sense of belonging in students can hinder academic performance and increase the likelihood of dropping out. He also warns that little is known about the conditions conducive to a sense of belonging or how a sense of belonging can be deliberately orchestrated for college students.

Zumbrunn, McKim, Buhs and Hawley (2014) state that student perceptions of academic and social support are correlated with their sense of belonging. Students with a sense of belonging also rated their professors as more enthusiastic, prepared, and professional. The authors concluded academic and social support by the instructor may be an important contributor to the student's overall sense of belonging. They also found that students with a higher sense of belonging displayed higher motivation for the course, and felt the course content was more useful than students with a lower sense of belonging. This study also found that students with higher perceptions of belonging reported feeling respected and valued by their classmates and that group interaction was an important source of support and belonging. This created a virtuous cycle they expected to lead to better academic performance and retention.

Thomas, Herbert and Teras (2014) reported that a sense of belonging was desirable for online students but that despite being able to collaborate through an online medium, the lack of face-to-face interaction made establishing relationships and a subsequent sense of belonging more difficult. In their study, they prompted instructors to adapt courses in an attempt to enhance a sense of belonging. Subsequent to the modifications, students reported increased satisfaction with both the course and instructor. However, instructors acknowledged that forming a sense of community online was difficult. One professor reported that students readily responded to him, but found it difficult to respond to other students. Other professors successfully established online student lounges to enable students to have unmonitored communications while others encouraged students to use Facebook, Skype and other internet social networking applications.

In a study of a general sense of belonging among community college students, Harerty, Williams, Coyne and Early (1996) determined that a higher sense of belonging among students correlated with higher perceptions of support and positive social actions, suggesting that targeted activities could support development of a sense of belonging. In another study on the formation of social connectedness and classroom community, Summers, Beretvas, Svinicki, and Gorin (2005) determined that students working together on classwork or projects generated a sense of classroom community which was itself closely tied to a sense of connection to the university. Freeman, Anderman and Jensen (2007) found that among (residential) college students, a sense of social acceptance was strongly associated with a sense of belonging at the university.

Concerning virtual communities and the sense of belonging or community outside of higher education, it has been shown that groups with a large number of members who are quasi-anonymous and who exist to simply search for information lack the elements necessary for group formation, and consequently do not develop a sense of group identity or community (Abfalter, Zaglia, & Mueller, 2012). However, in another study of a large online community established to exchange purchasing knowledge and experiences, members' perceived similarity to other members, trust, and familiarity were correlated with a sense of belonging (Zhao, Lu, Wang, Chau, & Zhang, 2012). In another study of online groups, emotional feeling, attachment, and trust played key roles in creating members' sense of belonging (Chih, Hsu, & Liou, 2017).

Sense of community. McMillan and Chavis (1986) define community with four elements: membership – the feeling of belonging or sharing a sense of personal relatedness; influence – the sense of mattering or making a difference to a group; integration and

fulfillment of needs – the feeling that the community’s resources can meet the individual’s needs; shared emotional connection – the belief that members have shared and will share history, common places, time together and similar experiences. Meyer and Allen (1991) propose three sources or components of commitment to higher education institutions: *Affective commitment* is the desire to remain, deriving mainly from feelings of comfort and personal competence; *continuance commitment* results from an appreciation of the costs of leaving, from having few alternatives, and from the costs outweighing the benefits; and *normative commitment* which results from instilled loyalty or from having received something that implies repayment is required. In a study of student nurses (Meyer, Allen, & Smith, 1993), all three components were shown to positively correlate with persistence.

Commitment and connectedness. A general commitment to the higher education institution positively predicts retention (Beck & Milligan, 2014). Institutional commitment resulting from the student’s overall experience explained 27% of the study’s variance while student background characteristics added only 8%. Social integration was found to be an important predictor of commitment which itself was correlated with advising effectiveness, suggesting that personal but non-face-to-face interaction with staff also builds commitment. Beck and Milligan further claim that commitment consists of several component factors that could be addressed by the university (possibly through social media or other forms of communication). For example, students who chose an online program for its reputation might be retained through the periodic stressing of this fact in subsequent communications. In this study, students with friends in the program had high institutional commitment, suggesting that if the university could promote friendship formation (online or otherwise), retention could be increased. The authors state that low commitment may be the result of the student failing to see

a connection between their courses and their long- term goals, or they may altogether fail to see the value of a college degree, both of which are addressable by the university using social media communication channels. Beck and Milligan's (2014) study also found that demographic and family characteristics were poorer predictors of retention than were student experiences. Even when weakly predictive, they conclude that demographics are not helpful in that they give no indication of why the student is not committed to the program or institution, nor what specific actions the university might take to increase commitment. Student experiences, however, are actionable because the university can influence online social interactions between students or with faculty. Laux, Luse and Mennecke (2016) find that online students with greater involvement in collaborative learning will have a greater sense of community and will ultimately develop a sense of connection to the campus. "...if a student can be encouraged to develop a perception of connectedness with his or her classmates, this will transfer to creating perceptions of connectedness with the academic institution as a whole (p. 462). They also found that higher commitment to the university translated into a lower intention to drop out and reduced the likelihood of actually dropping out.

Related to commitment but broader in scope, *embeddedness* describes a network of forces, some of which are able to be influenced by the university, that make it difficult to leave (Larking, Brasel, & Pines, 2013). Sub-components of embeddedness are *links*, *fit*, and *sacrifice*. Links are formal and informal relationships between the student and other students, people at home, or activities they engage in. Links are broader than a simple commitment to the organization as it includes people outside of the organization such as parents who may have urged the student to attend college. Fit is the sense of how well the university fits with the student's values or career direction. In the study, they find that students are more likely to

persist if “they perceive the instrumentality of their college program to their future success and experience strong connections to significant others and activities with others...” (p. 86).

Sacrifices are the potential costs paid by the student from losing friends, scholarships, credits or money, or teammates. According to Larking et al., the more social, psychological, financial, or physical connections to the university, the more likely the student is to persist.

Connectedness occurs when an individual is actively involved with others or an environment, and that involvement creates a sense of comfort or well-being (Harety, Williams, Coyne, & Early, 1996). Connectedness and engagement are related and are used interchangeably though engagement tends to be used as a measurable behavioral concept. Engagement has been explored in many disciplines which have developed their own terminology for the concept (e.g. student engagement in higher education; civic engagement in sociology; employee engagement in organizational behavior; customer engagement in marketing) (Brodie, Hollebeek, Juric, & Ilic, 2011). Active, customer engagement on Facebook company pages reinforces active participation in the marketing process and instills trust among customers who subsequently spread positive word-of-mouth. Trust is the most significant factor influencing customer loyalty, and the purchase of products and services by consumers is correlated with those that follow their brands on social media (Nisar & Whitehead, 2016). Virtual communities that establish accurate and reliable messages can build relationships with customers. Content that is accurate, relevant and timely makes customers visit the Facebook page enthusiastically and encourages them to get involved and engaged (Chih, Hsu, & Liou, 2017; Islam & Rahman, 2016).

Engagement. Peers can also have positive effects. Bettinger, Liu and Loeb (2016) found that among online students at a large, for-profit university, peer-to-peer interaction on

discussion boards correlated with increased GPAs and retention among students who initially were less likely to engage in online discussions. The effect was not large but was significant. When peer-to-peer communication was not emphasized but student-instructor communication was equivalent between online and residential students in the same program, the online students felt a lower sense of integration with their programs (Hammond & Shoemaker, 2014). Mature, first semester, distance students rarely spoke about a sense of connection to the university but did value connections to other students, mainly for the appreciation that other students were also struggling (Kahu, 2014).

Affective engagement is the feeling of involvement in the school as a place and that its activities are worth pursuing. Affectively engaged students feel included in the school and that it is a part of their lives. They believe that school will provide them with the tools that will enable them to be successful. Affective engagement's primary impact is to promote classroom participation and persistence, but students with high levels of belonging and identification with the school also have higher levels of motivation and effort (Finn & Zimmer, 2012). Kahu (2013) considers engagement to be synonymous with attachment or the student's feeling of belonging, and states that engagement influences are bi-directional, "... engagement breeds engagement... good relationships foster engagement, which in turn promotes good relationship" (p. 767). The timing of social engagement seems to also affect retention. Flynn (2014) found that students' social engagement is significantly related to graduation when it occurs after the first year. Virtual social interactions may increase persistence, and if associated only with a particular course, may not create a source of support but may still create an encouraging environment that supports persistence (Hart, 2012). Hart also concluded that persistent students believed social relationships can be established online, that students who

are better at forming online relationships were more likely to persist, and that the perception of belonging to a virtual community contributes significantly to discriminating between persistent and non-persistent learners.

Successful online students also attribute persistence to academic or program factors such as relevancy of the program to individual or professional goals, but also to non-academic factors such as gaining a sense of accomplishment, satisfaction with the program itself, and institutional support (Yang, Baldwin, & Snelson, 2017). Students with lower GPAs or freshman were more likely to withdraw, as were students who had previously withdrawn from online classes (Cochran, Campbell, & Leeds, 2014). Markle's (2015) study in non-traditional students, though not online, found GPA to be the most important factor for both men and women and other factors sometimes thought to influence persistence, such as age, race, income and social integration, were not significant for these students. In Gayton's (2015) survey of online faculty and students, faculty cited student self-discipline as the top-rated persistence factor followed by the quality of student-faculty interactions and institutional support to students. Students ranked faculty instruction and meaningful feedback as the top two persistence factors.

Social media, loyalty, and customer retention. The internet in today's format is referred to as Web 2.0 and allows users to interact with two-way communication (Tuten & Soloman, 2015). Information does not just flow down from companies, governments, universities, etc., but also flows up from individuals and horizontally between individuals. Social media are defined as "the online means of communication, conveyance, collaboration, and cultivation among interconnected and interdependent networks of people, communities, and organizations enhanced by technological capabilities and mobility" (p. 4). Tuten and

Soloman describe how the influence of social media grows as more people join online communities (i.e. the *network effect*) to both consume and contribute content. Social utilities, such as Facebook, allow people to form digital relationships, form virtual communities with shared interests, or interact with business.

Engagement and loyalty. Loyalty to a product or service can be developed through user engagement with company-sponsored social media pages on Facebook (Ho, 2015). An online community can be established and have a significant, positive effect on relationships between the customer and the company. Ho states that online community building has been recognized as an effective approach for developing and maintaining customer relationships. The Facebook Fan Page has been shown to have potential to enhance brand loyalty via user engagement on the Facebook page, an essential element to fostering brand loyalty (Zheng, Cheung, Lee, & Liang, 2013). Liu, North and Li (2016) showed that customer engagement is predicated upon their belief or perception that some benefit occurs or is forthcoming. These benefits need not be tangible, such as discounts, but can be intangible, such as having a venue to express thoughts to others or being associated with a brand, particularly luxury, premium or social cause brands. Halaszovick and Nel (2017) likewise found that social media engagement and interaction was driven by the desire to enhance one's self-image through group association. The user achieves a sense of belonging, community or status on account of contributions and subsequent association with the brand or institution. Studies have shown that Facebook communities can have an effect on behavior, such that fans may change their behavior or perspectives in order to meet expectations of the group and to better fit in (Chih, Hsu, & Liou, 2017; Simon, Brexendorf, & Fassnacht, 2016). This internally driven motivation is accompanied by an external motivation as well. Self-image enhancement can occur via public

recognition or reputation, and the authors state that reputational motives strongly motivate community participation. For example, when consumers share experiences with other consumers, they might expect to be perceived as knowledgeable or an expert. An important observation is, that as the number of page fans (a.k.a. *followers*) increases, a stage-fright effect (i.e. fear of embarrassment) can emerge for some which reduces willingness to participate in the community. Hypothetically, this effect could be stronger in the university environment as the susceptible student might fear a loss of anonymity with peers or with professors.

Brand relationships. Firms can use Facebook pages and groups to enhance satisfaction and loyalty, as long as they offer the right kind of relationship benefits (Gummerus, Liljander, Weman, & Pihlstrom, 2012). Gummerus et al. found that content with entertainment or social benefits was most effective for enhancing satisfaction and loyalty towards the firm. Visitors attracted to the site by lotteries and competitions were not necessarily loyal. The value of social benefits depended on the Facebook community. Social benefits are developed by providing opportunities for member-to-member interactions. A Facebook Like of a company or brand page is automatically communicated to the user's connections but is also used as a way to stay informed about the brand (Halaszovich & Nel, 2017). Halaszovich and Nel also noted that pull strategies to increase Facebook Likes from page visitors have questionable subsequent value, likely because the relationship between the institution and the customer was not naturally established. Social media seems to build customer loyalty through interaction with a brand's social presence (Pongpaew, Speece, & Tiangsoongnern, 2017). They state that social presence conveys a sense of human worth, sociability and human contact. By creating a compelling social presence, customers are more attracted to the brand and feel more involved in it which fosters loyalty and retention. Zheng et al. (2013) assert social media tools such as

Facebook have enormous potential to enhance brand loyalty. The essential ingredient for building a (brand) community was user engagement, and they urge social media content developers to provide extrinsic incentives for participation. When potential users could easily see a benefit to themselves from participation, they were more likely to contribute, and it was only through participation that there was increased loyalty. Interactivity with a fan base is also influenced by the type of social media post. An analysis by Hannah and Lam (2017) showed that entertainment posts were more engaging than news or promotional posts (announcing product innovations, in this study). Posts that express the writer's emotions and personality were also more engaging. Hannah and Lam also found that the use of links that removed the reader from the Facebook environment may demotivate the user from engaging with the original content of the post.

Social media, engagement, and higher education. Nevzat et al. (2016) noted how universities use social media to recruit and retain students and investigated how the use of a university Facebook page was related to students' identification with the university. Confirming that Facebook use did create a sense of belonging, its use was also linked to trust of and loyalty toward the school, and was associated with positive behaviors such as promoting the university to peers and being an active member of the university community. They recommend not just a strong social media presence, but that the university focus on developing an interactive experience on social media, not just use it for a one-way communication of information. In a study of social media use by nonprofits, Lovejoy and Saxton (2012) put forth an optimal "hierarchy of engagement: Information—Community—Action" (p. 349) which drove overall engagement, measured by users not just feeling engaged, but taking some form of action. Fitzgerald et al. (2016) urge reaffirmation of the importance of engagement to the

role of the university. Their use of the word *engagement* is meant to encompass both students and their communities, and they emphasize the centrality of engagement in the mission of the university, charging the university with both educating the student and enabling the student to serve society. They suggest one way to engage students is through the use of social media.

“Students see the most value of social media in the classroom as a facilitator of conversations (Neier & Zayer, 2015). Neier and Zayer state that students value a sense of connection with their classmates and the instructor. Salmon et al. (2017) showed that participants in Massive Open Online Courses (MOOCs) valued social media for its ability to enable networking with people of different backgrounds. Their participants felt they were part of a larger online community with a shared goal.

Social media and teaching. There is limited evidence of the effectiveness of using Facebook as a core teaching tool (in courses) say Callaghan and Fribbance (2016), who continue by stating that Facebook is better used in a supportive or peripheral role such as peer-to-peer support and networking. They also mention social media’s potential to build a community among past, present and future students. In a quasi-experiment, the authors’ social science faculty built a Facebook page intended to build participative networks with students, and in particular, to help address the isolation felt by some online students. Their intent was not to teach but to overcome isolation associated with distance learning and encourage students to participate in an academic community. They concluded the experiment was successful. Brech et al. (2017) used Facebook page actions (i.e. Likes; Shares; Comments) to measure engagement on university-sponsored Facebook pages and concluded that large, well-known universities have the highest engagement levels, but as the number of Facebook page likes increases, the relative engagement – that of a single fan – decreases. They recommend posting

four times per week, embedding incentives for participation, and sending personalized messages. Callaghan and Fribbance (2016) also used Facebook Likes to measure engagement and analyzed the types of posts drawing the most reaction from students. They attribute the success of the program to the key features provided by Facebook-hosted pages for community building: It is an inventive way to engage students; it provides access to resources; it creates a space for discussion to take place. Social media provides an opportunity to build communities for both online and face-to-face classrooms and can increase interaction between students and teachers and with other students (Hentges, 2016). Seargeant and Tagg (2014) describe the elements leading to successful virtual communities: “a shared set of cultural references; a regular pattern of interaction; some sense of belonging” (p. 9).

Students may form their own social media groups and use them to share information, pose questions and solicit answers from the group. Not all students are active users. Although some are highly involved both socially and academically in the groups, others are *lurkers* who presumably find value from monitoring discussion without directly creating discussions of their own (Adalberon & Saljo, 2017). This creates a problem with measuring the impact of engagement on Facebook pages with a large presence of lurkers. Pongpaew, Speece and Tiangsoongnern (2017) propose considering lurkers in the page strategy and content development process.

Social media is also used to recruit new students. Social media branding activity, specifically social media interaction, has a positive effect on university student recruitment, and results are stronger when the university uses social media interactively (Rutter, Roper, & Lettice, 2016). This research determined that fostering relationships with students who already endorsed the institution (defined as *Following* on social media) was the key to successful use

of the social media channel for recruitment. There also occurs a multiplier effect as engaged students retweet or share relationship-building content with other students. Responsiveness to student questions was another success factor which led to better engagement with followers and prospective students. The authors concluded that interaction or lack of interaction influences recruitment demand from prospects, and that interaction itself can be a source of competitive advantage. Common across all their findings was the need for a preexisting validation by prospective students. This meant a favorable brand image or the development of one through the initial monitoring of the social media channels. Once the student made a decision to follow on social media, the authors concluded that the validation threshold had been met, and found that these students reacted most positively to subsequent attempts to interact via 2-way communication. This study did not address demand from existing students, that is, would a current student be influenced by social media to continue consuming higher education from the current institution? The objective of this study is to determine if interaction in university-sponsored social media is associated with higher retention levels.

Social media and loyalty. Linkages also exist between the students' use of social media and subsequent identification with the university and loyalty to it. In analyzing a university's official Facebook community, students' perceptions about their relationship to the Facebook community were linked to the students' identification with the university brand. Higher identification predicted higher loyalty to the university (Nevzat, Amca, Tanova, & Amca, 2016). Another empirical test designed to determine the impact of interaction through a Facebook brand community of (a hotel chain) found that members' active participation with the social media page significantly influenced brand loyalty. The authors recommend fostering participatory behavior via social media to develop brand loyalty (Kamboi & Rahman, 2016).

In addition to using Facebook to further academically focused discussions or discussions associated directly with a class, Facebook is being used to create a *participatory learning culture*, defined as a community of like-minded students sharing a common need or interest (Davis, Compton, Farris, & Love, 2015). This study indicates that online student communities can be successfully established digitally and that face-to-face is not required to form relationships. Zhang and Lin (2015) concluded that content and messaging that encourage interactivity, versus passive consumption, is key to successful community establishment. “Strategically designed and developed messages have the power to arouse users’ interest, which encourages their willingness to respond, to be involved and to participate” (p. 689). Using social media to deliver messages that could also be delivered by other traditional media such as press releases or advertisements through newspapers or radio tend to be of an educational style, and in Zhang and Lin’s study of social media, accounted for the least amount of engagement. Invitations to a quiz, contest or vote were more likely to induce participation as these give users the ability to apply their knowledge and skills and express themselves. Interactivity was also enhanced through identifying the most influential individuals and engaging them to become champions or ambassadors and lead discussions and interactive activities. This study was limited in that it only examined the use of social media in a single category, so their discussion of the types of posts that drew the most engagement might not apply to other categories such as non-traditional students in online education.

Social media and retention. In 2012 Facebook offered a specialized social media application within the Facebook environment called the Schools App. This was an application with pages and content space specifically designed for use by students and administrators, and it was made available for testing in a limited number of schools. Administrators could manage

content and interact with students, but were also able to determine the amount of app usage by each student, and could subsequently match student ID from the app with the respective schools' internal databases. The School App was designed to deliver content that consisted of procedural knowledge, information, success strategies, and advice, as well as strengthening or reinforcement of intellectual competence, college identity, and sense of belonging and connectedness (Fagioli, Rios-Aguilar, & Deil-Amen, 2015). In a study of approximately 17,000 students at seven community colleges across the US, Fagioli et al. determined both active and passive users of the app had increased persistence, as measured by enrollment in the subsequent term. Active app users had a 28% higher likelihood of persistence while passive users were 35% more likely to reenroll. Inactive members were about 40% less likely to reenroll. The authors conclude there was a considerable positive effect on persistence based on usage of the application. The authors note that community college students have limited opportunities to connect with teachers and classmates outside of the physical classroom, which is also hypothesized to be true of online students in this study.

Clark, Fine and Scheuer (2017) restate the importance of university-stakeholder relationships to the financial health of the institution, and particularly with the institution's students. They cite a large number of universities that report using social media and their official websites as a way to connect with their stakeholders, and using social media as part of their marketing strategy. Their study was designed to determine whether student engagement with university-sponsored social media created a higher quality relationship with students. They conclude that social media can positively impact university-student relationships and that students who followed more of a university's social media channels reported an even higher relationship quality.

Transition and Summary of Section 1

As the number of traditional and non-traditional students enrolling in online courses has continued to increase, the attrition rate of online students has become a common issue for universities (Allen & Seaman, 2015; Seaman et al., 2018). Higher education institutions have responded with a variety of strategies to increase retention including attempts to foster social integration through non-academic activities, the goal is to create a sense of belonging or connection to the university (Lehman & Conceicao, 2014). A student's social integration (with other students, faculty and the school itself) and sense of connection (or loyalty) to their school are important elements affecting retention, but the geographic distance from campus for most online students often translates into a perception of emotional distance. The distance from campus makes traditional social integration strategies, such as living on campus, attendance at student activities, or membership in student clubs, etc. difficult or infeasible (O'Shea, Stone, & Delahunty, 2015). Compounding the problem for online higher education providers is that the online student's life position tends to be significantly different from a residential student. They have different pressures and needs, and the tactics and tools to foster student integration for the traditional student may be ineffective or impractical for the average online student.

Social media has emerged as a means to connect with online students. Many schools sponsor or provide some type of social media though few appear to fully exploit its two-way communication ability. Instead, most use social media as an additional channel to communicate out to students. While there is little literature on the retention impact of social media on online students, there is evidence that social media can be used to form stronger relationships in both higher education and business settings, and that relationship formation, whether through face-to-

face or social media, contributes to loyalty which is a component of persistence in the higher education model (Brech et al., 2017).

Section 2: The Project

The data collection and analysis strategy used for this research project will be described in the following section. This work discusses the role of the researcher, selection of the survey and online student populations, how data will be collected and analyzed, and how the subject's privacy will be protected. The survey instrument used will be described along with the concepts it purports to measure, and its reliability and validity will be assessed. This work will also discuss how scores will be calculated, the additional variables included in the model will be identified and described, and the data analysis process will be documented.

Purpose Statement

The purpose of this quantitative correlational study is to study the relationship between online students' usage of institution-sponsored social media and, (1) their sense of social integration measured by the Classroom and School Community Inventory (CSCI), and, (2) their subsequent retention. Previous research has not established whether participating in social media discussion boards or digital interaction with university content managers or with other online students can create a sense of connection to the university or a personal connection to other students, or if social media usage has any bearing upon online students' decisions to continue enrollment at the same institution.

Role of the Researcher

The Classroom and School Community Inventory (CSCI) (Rovai et al., 2004), a validated and reliable survey, is used to gather data to answer one of the research questions. Permission to use this survey has been secured from the lead author. The researcher collected data using an electronic survey (Appendix A) delivered by university email to all students who were enrolled during spring term of 2018. University database analysts matched respondents' surveys with

their social media usage profiles, demographic data, and subsequent term enrollment data from university databases.

The researcher also collected actual Yammer, Blackboard and Facebook usage data. Yammer and Blackboard social media channels were only available to current students. These were easily matched to demographic and enrollment data, however, Facebook users must be matched on the basis of first and last name alone, and may not have been current students. Facebook page usage was only be included in the analysis when there was a reasonable expectation the user was accurately matched with a current student. After appending demographic and enrollment data, the university's Institutional Effectiveness department ensured all unique student identifying information was removed prior to providing the file to the researcher. All subsequent analysis was performed by the researcher using Microsoft Excel and IBM SPSS statistics v.24 software.

Participants

Prior to the start of data collection, the survey instrument and collection process was approved by the university's Dean of Students. Undergraduate, graduate and certificate students who were enrolled during Spring Term, 2018 were emailed the Qualtrics-based survey using the university's password protected official email system. After matching survey respondents with demographic and enrollment data, and matching social media usage data with the university's database of demographic and reenrollment information, names of students were deleted before further analysis.

Research Method and Design

This study is quantitative in nature. It investigates whether any relationship exists between actual social media use and the CSCI score, and actual social media use and retention in

the fall semester, 2018. Social media use across three university-sponsored social media channels (Facebook; Yammer; Blackboard) was combined into a single categorical variable (user/non-user). The CSCI score is the sum of the student's responses to 10 questions scored on a Likert scale using the range zero to four. Student reenrollment in the fall semester is a categorical variable (retained/not retained). Retention is defined as enrollment by a spring semester online student in at least one online course in the fall semester, 2018.

This study uses two data sets. The first consists of all online students during the spring, 2018 semester. The second consists of only those students who complete the entire survey. From the survey data set, cases of students who failed to complete the survey, who graduated after the spring or summer semester, or who expected to graduate within a year were deleted to avoid skewing reenrollment results. The average retention rate of the second data set is expected to show a higher retention rate than the overall average from data set one because students who had already decided to leave the university at the end of the spring semester could also be expected to complete the survey at lower rates.

Conceptual framework for additional study. This study examines social interaction transpiring via social media and its impact on the student's sense of community (measured by the CSCI), and with retention in the fall semester. Rovai (2003) (and earlier models) locate social integration (potentially associated with social media use) within the *Internal Factors* classification of retention influences, shown below in Rovai's model.

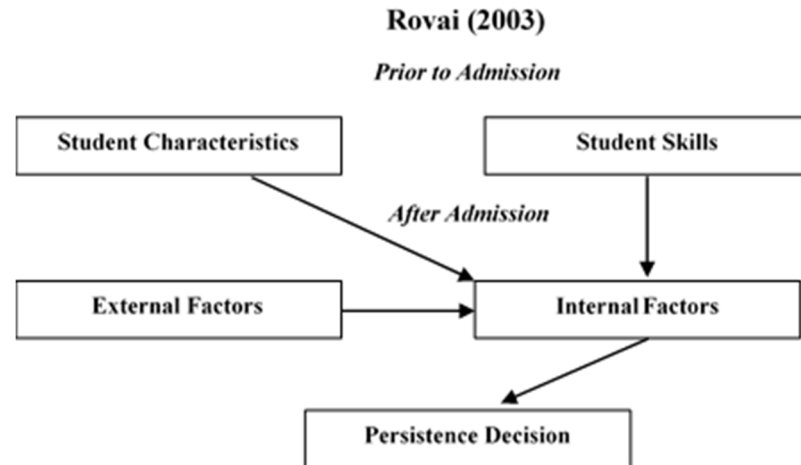


Figure 6. Rovai's Retention Model

Discussion of method. The method of this research project is quantitative. According to Goertzen (2017), quantitative methods are concerned with collecting and analyzing data that can be represented numerically and require accurate and reliable measures. Compared to qualitative research, quantitative research is effective at answering quantifiable what and how questions about a situation. These questions may begin with phrases such as how many, what percentage, or what is the correlation between. Unlike qualitative research, it does not supply insights into how people think or behave. Quantitative research is evaluated using statistical tools including central tendencies, cross-tabs and comparison of means, and regression. Because quantitative datasets may be large and given appropriate choices of statistical analysis tools, findings from a sample can be better generalized to the population and may demonstrate support for knowledge previously only known anecdotally. This study will use observed data – actual usage of social media and reenrollment status (in both data set one and two) – and uses qualitative survey data scored on a Likert scale to produce an ordinal variable in data set two. Opinions of students are not directly measurable and are not a rigid, primary quantitative measurement. As such, the

ordinal variable resulting from the survey (the CSCI score) was expected to vary significantly from case to case.

Discussion of design. This study is designed to investigate whether two independent variables tend to move in the same direction. This is a non-experimental study – none of the variables being examined in each of the research questions will be manipulated nor is there a statistically determined sample or control group. As such, there are no firm conclusions about causality between the variables nor inferential conclusions about the online student population.

An online survey containing pre-coded answers to questions was put to all students who were enrolled in at least one online course during spring term, 2018. The survey established a single, numerical value representing the degree to which the respondent feels a sense of connection or belonging to the university. This sense is defined as *social integration* for the purpose of this study and is an ordinal variable. Another variable consists of student social media usage. It is a binary, categorical variable generated from a list of students who engaged with university-sponsored Facebook pages, Yammer groups, or non-term Blackboard discussion boards during the spring semester. The researcher classified each student as a user or nonuser of social media without respect to the number of instances where the student engaged with social media. No recorded engagement with social media resulted in a classification of *nonuser*, while one or more instances of posting, responding to another's post, or liking a post resulted in the student being classified as a *user*. Student usage of Yammer and Blackboard discussion groups were extracted from the university's internal databases. University analysts also attempted to match Facebook user names provided by an authorized 3rd party Facebook data provider with the registrar's list of current spring online students. Reenrollment and gender data, also binary, categorical variables, were made available from internal databases. The variables *GPA*, *level*,

marital status, *transfer status*, and *age* were provided from the university's database. Students' GPAs (scale variables) were rounded to the nearest whole number and converted to a letter grade. Student level (Undergraduate; Graduate; Doctoral), marital status, and transfer status are nominal variables while student age is a scale variable but was grouped into commonly used nominal categories such as Millennials or Baby Boomers.

Summary of research method and design. The relationship between social media usage during spring semester and student retention in the fall semester is assessed using Pearson's Chi-squared Test of Independence, the Permutation test for differences in randomized groups' proportions, and logistic regression. The relationship between student use of university-sponsored social media during spring term and student perceptions of social integration measured by the CSCI scale is assessed using the Mann Whitney U test. Data were analyzed using Microsoft Excel, IBM's Statistical Package for the Social Sciences (SPSS), and the R Stats Package.

Population and Sampling

Discussion of population. The population for this study consists of over 60 thousand online students who were enrolled in at least one course during the spring semester at the university. Approximately 60% were female. Approximately 50% were graduate-level students, the balance being undergraduate and certificate students. Students who graduated before fall semester were removed from both datasets.

All spring online students were offered the opportunity to complete the survey and be entered into an incentive drawing (offered by the Department of Institutional Effectiveness, the sponsor of the study). Students who were known to have accessed university-sponsored social media at least once during the semester were offered an additional nominal incentive for

participation (a window sticker). There was no attempt to randomly choose students for the survey, making the survey sample a convenience sample. Demographic variables (age; gender; GPA; credits completed; school) of those who respond to the survey were compared to the population (all Spring Semester 2018 students) and to the group of students who did not respond (current students) to assess whether the responders appeared representative of the online student population during spring 2018. Since the survey was only be administered to online students of the spring 2018 semester, the fall retention rates can only be compared with other spring-fall semester pairs. There are no uniformly reported national averages for reenrollment in the fall semesters from the spring semester for online students.

Discussion of survey process. A link to the online survey instrument was delivered via official university email. All students are assigned an email address upon acceptance to the university and are urged to check for email messages daily. A concern was that student non-responders to an online, opt-in survey (such as this) will introduce bias and further limit the reliability and generalizability of the project's conclusions (Fosnacht, Sarraf, Howe, & Peck, 2017). These researchers conducted an analysis to address this issue in response to concerns about the downward trend in student participation in online surveys. In their analysis of the National Survey of Student Engagement (NSSE), an online survey used annually by over 750 colleges and universities, they found that even low response rates of 5-10% were adequate to generalize NSSE results to the student population as long as the sampling frame was at least 500 students. As this was the first survey of its kind ever administered to this university's students, there should not be to survey fatigue induced by the university, and since the survey was presented to approximately 60,000 online students, a response of 3000 students will yield sufficient responses to ensure reliable results and generalizable conclusions. To boost the

response rate, a small cash lottery incentive, shown to boost response rates in other settings (Kelly, Vidal, & Burden, 2016) was offered to all responders, and an inexpensive bumper sticker designed to invoke school pride was offered to students known to have participated in university social media during spring semester. As there is not a statistically determined sample set, a small incentive, while introducing some responder-bias, was not expected to skew results or conclusions.

Data Collection

Instrument. This study used the School Form of the CSCI survey tool (Rovai et al., 2004). The instrument is found in Appendix A and permission to use is in Appendix B. Rovai et al. developed and validated this tool to “measure the psychological sense of community construct on a school-wide basis that can be used in a variety of settings and educational levels, to include distance education” (p. 268). It is a self-report instrument that provides “operational measures of classroom community and school community in both traditional and distance education environments” (p. 276). The authors developed this tool to facilitate research into how the *sense of community* applies to distance learners in order to address the larger issue of lower student retention in distance education programs (Carr, 2000; Lehman & Conceicao, 2014; IPEDS Data Center, 2018). The tool developed by Rovai et al. measures sense of community in both the classroom and the school overall, however, this study used only the school scales (10 questions versus 20 for the entire CSCI) as the student sample came from many different courses and sections and these data were not appended to survey results. The school scales of the CSCI are able to distinguish between the student’s sense of *social community* distinctly from the student’s sense of *academic community*. School community is the underlying sense of “spirit, cohesion, trust, safety, trade, interdependence and sense of belonging (Rovai, Wighting, & Lucking, 2004,

p. 267). Academic community is a different construct. It is the extent to which the community members “share group norms and values and the extent to which their educational goals and expectations are satisfied by group membership” (p. 267).

The School Community Scale of the CSCI (Rovai et al., 2004) consists of 10 questions such as *I feel that I matter to other students at this school* and *I feel that I can rely on others at this school*. Each question is followed by five-point, Likert scale: strongly agree; agree; neutral; disagree; strongly disagree. Answers are scored so that the least favorable choice is assigned a score of 0 and most favorable a score of 4 for a total possible score of 40.

The survey’s authors assert face validity because items appear to be practical, pertinent and related to the purpose of the instrument. The instrument’s items were also evaluated by a panel of four experts who concluded the scale had high content validity. Validity was also established by evaluating the scale’s ability to vary inversely with another scale (Dean, 1961) validated for measuring alienation among students. Factor analysis revealed the school community scale consists of two factors: school social community and school academic community, which as the authors (Rovai, Wighting, & Lucking, 2004) state, confirms the distinctiveness between student feelings about social and learning communities. The authors state the overall instrument and the sub-scales (Social Community; Academic Community) are reliable with acceptable internal consistency coefficients and showed stability using a two-week interval between pre-test and post-test measurements.

Data collection techniques. The 10 questions of the school portion of the CSCI (Rovai et al., 2004) and the university’s additional questions were coded into a Qualtrics online survey tool. A link to the survey was emailed to the official university email address of every current online student from spring semester, 2018. A cash lottery incentive was offered as well as a

school spirit item of nominal value only offered to approximately 2,200 students who were known to have accessed social media during spring term, 2018. A reminder was sent to non-responders at one week and the survey closed after two weeks. Concurrently, social media usage data were extracted from university databases (boards/groups accessed; number of original posts; number of responses to others) and was matched with survey respondents after the survey closed. Enrollment data was extracted for the spring and summer semesters for the purpose of removing graduates from the sample. Other data such as school, level, GPA, age and gender were be appended to the electronic file. The non-survey data was also provided by the university and consists of fall retention status of spring semester students.

Data organization techniques. Survey results, social media usage, reenrollment, and demographic data were consolidated to one Microsoft Excel spreadsheet. Excel was used to recode or combine variables as needed then was imported for analysis using SPSS. Students who graduated after the spring or summer term were deleted from both data sets. Additionally, students who were projected to graduate in 2018 or 2019 were deleted from the survey data set. Given the proximity to graduation and potentially longer association with the university, it is assumed these students are not reflective of the online student body as a whole during spring semester. These students have already demonstrated their perseverance and are most likely to reenroll in the fall semester, all things being equal. The spreadsheet will be converted to an IBM SPSS data file for analysis and a backup of this file will be maintained on a university server via the researcher's Dropbox account. The account is password protected.

Data Analysis

Variables in the study. The School Portion of the Classroom and School Community Inventory (Rovai et al., 2004) is a variable in this study. The CSCI school survey yields a

number between zero and 40 for each respondent and represents the student's sense of school community and the sense of belonging to the university as a whole. Each of the 10 questions is scored on a Likert scale of zero to four.

Another variable is student usage of university-sponsored social media. Yammer and Blackboard usage data from university databases were combined with Facebook page data sourced from a third party provider forming a single binary variable of social media use (user/nonuser). No recorded engagement with social media resulted in a classification of *nonuser*, while one or more instances of posting, responding to another's post, or liking a post resulted in the student being classified as a *user*.

The third primary variable, student fall semester registration status, is a binary nominal variable (retained/not retained). Any spring online student who registers for at least one class in the fall semester is considered retained.

Additional variables were included for the purpose of adding explanatory power to the regression model (Park & Choi, 2009). GPA, level, transfer status, marital status and gender were appended to the data sets, or were asked for as classification questions on the survey and then appended.

Table 3

Primary Analysis Variables

Variable	Description	Type
Fall retention	Fall 2018 enrollment status	Binary nominal (retained/not retained)
CSCI	Sum of 10 questions with 5 point Likert scale	Scale ordinal
Social	User of university-sponsored social media	Binary nominal (user/nonuser)

Quantitative data analysis. The first stage of analysis consists of descriptive statistics. The demographic profile of the spring online student population is compared to national averages (when national data exists). The demographic profile of the spring online student population is also compared to the demographic profile of spring online students who completed the entire online survey. The demographic profile of the online student population that was retained is compared to the subset of students who did not register for at least one class in the fall semester and had not graduated after spring or summer semesters.

The second stage of analysis will be to conduct statistical analysis to examine the relationships between social media usage, CSCI scores and retention outcomes using nonparametric tests. Nonparametric tests are useful when one or more variables are measured on a nominal or ordinal scale and when the distributional assumptions necessary for parametric tests are not met (Green & Salkind, 2008).

RQ1: Does engagement with the university's social media affect the likelihood that an online student will reenroll?

H₁₀: There is no relationship between students' utilization of university-sponsored social media during the spring semester and retention in the fall semester of 2018.

This relationship was assessed using the Chi-square test for independence, the Permutation Test for the difference of proportions of two independent groups, and logistic regression. These tests analyze the relationship between two categorical variables: social media use and retention (Pallant, 2010). The data set for this analysis is the complete online spring semester student population.

Chi-square. Chi-square was used to assess if the expected and observed numbers of students who reenroll are significantly different from the expected value. Chi-square is based on

a cross-tabulation table with the cases classified according to university-sponsored social media use (user or non-users) and fall 2018 retention status (enrolled or not enrolled). Each cell within the cross-tabulation tables shows the difference of that cell's results versus the average for the group to which the cell belongs. All cross-tabulation data meets the chi-square test assumption that each cell of the cross-tabulation has at least five cases. The following cross-tabulations are assessed using Chi-square for the proportion of students retained or not retained:

Social media users and non-users in total

Female students who used social media versus females who did not

Male students who used social media versus males who did not

Part-time students who used social media versus part-time students who did not

Full-time students who used social media versus full-time students who did not

Generation Z, Millennials, Generation X, Baby Boomers and Silent Generation students who used social media versus students who were non-users from each generation

Students who transferred to the university and used social media versus transfer students who did not use social media

Students who have not transferred credits into the university and used social media versus non-transfer students who were non-users of social media

Students who were single, married, divorced, widowed or those with unknown marital status who used social media versus students by marital status who were non-users

Veterans who used social media versus veterans who did not use social media

Non-veterans who used social media versus non-veterans who did not use social media

Undergraduate, graduate and doctoral level students who used social media versus non-users of social media from each grade level

Students who used social media versus students who did not were classified and grouped by their cumulative GPA

Logistic Regression. Retention and its relationship to social media use were also studied using logistic regression. Logistic regression allows the researcher to test models to predict outcomes with two or more nominal categories. The researcher can assess how well predictor variables explain the dependent variable. The following predictor variables are assessed: grade level; cumulative GPA; generation (age group); full or part-time status; gender; marital status; social media use. Collinearity diagnostics on the independent dichotomous variables were conducted using SPSS and all variables' tolerance values were >0.1 and variance inflation factors were <10 which indicated low multicollinearity between independent variables (Pallant, 2010; UCLA: Statistical Consulting Group, n.d.).

Permutation Test. The Permutation Test is considered a non-parametric test and requires no assumptions about the distribution of the statistic of interest. To conduct the test for this study, 10,000 randomly drawn samples of approximately 3000 students (the number of social media users in the entire spring semester online student population), net of students who graduated. The difference in the rate of reenrollment between users and non-users of social media was computed and compared to the test statistic, which for this study was the observed difference in the proportion of students who reenroll for fall semester between those who were social media users versus those who were not. This calculated difference in proportions from the randomly drawn samples was compared to the observed difference, and the number of samples groups where the calculated difference was the same as or greater than the observed test statistic were added and divided by 10,000 to yield the resulting p value (Ludbrook & Dudley, 1998).

RQ2: Does engagement with the university's social media affect the student's sense of community and belonging?

H2₀: There is no relationship between students' utilization of university-sponsored social media and the student's CSCI score.

This relationship was assessed using the Mann-Whitney U test and was conducted on the sample of students who completed the online survey. This test is used to test for differences in two independent groups (users and non-users of social media, for this study) on an ordinal measure (the CSCI score, for this study). The test is a non-parametric alternative to the t-test and compares median scores instead of means (Pallant, 2010; Leeper, n.d.).

Table 4

Summary of Hypotheses and Corresponding Statistical Tests

No relationship between ____ and ____:		Tests
<hr/>		
H1 ₀	<u>Among all spring online students</u>	
	Social media use (nominal)	Chi-square test
	Fall retention (nominal)	Permutation test
		Logistic regression
H2 ₀	<u>Among online students who completed the survey</u>	
	Social media use (nominal)	
	CSCI (ordinal)	Mann Whitney U
<hr/>		

Reliability and Validity

This study uses the CSCI School Form (Rovai et al., 2004) to measure the sense of community perceived by the student in relation to the university overall. Rovai et al. state that a

sense of community toward a school means the student should feel that they belong and feel safe at the school, that they trust others and have access to them, and that they are supported by the school. Students should also feel they matter to other students at the school and believe their educational goals will be met through their own and others' commitment to shared goals and values.

Reliability. Reliability refers to the similarity of results provided by independent but comparable measures of the same trait or construct (Churchill, 1991). A reliable survey instrument means the individual questions, while independent, measure the same construct. Cronbach's Alpha is a measure of internal consistency – how closely related a set of questions are as a group (UCLA: Institute for Digital Research and Education, 2018). Rovai et al. (2004) calculated the Cronbach's Alpha for the CSCI School Form was 0.83.

Validity. Validity is synonymous with accuracy and correctness (Churchill Jr., 1991). If a survey is valid, it means the survey correctly measures what it purports to measure. In this study, a valid CSCI School Form score would mean the survey instrument accurately assesses students' sense of community. Rovai et al. (2004) established face validity of the instrument by concluding the items appeared practical and related to the purpose of the instrument. Content validity was assessed through review of the items by a panel of four experts in the field of classroom and school community. The CSCI was administered to both online and residential students along with the Classroom Community Scale (CCS) and the Dean Alienation Scale (DAS) (which properly negatively correlated with the CSCI) to establish construct validity. The CCS and DAS are previously validated survey instruments. Stability was assessed by repeating the CSCI after a two-week interval.

Summary of reliability and validity. Rovai et al. (2004) conclude that sufficient evidence exists to use the CSCI in educational research, including online higher education, since a portion of the study's participants were enrolled in online courses. Because the CSCI evaluates sense of community for both social community and learning community, it may provide insight into where to best focus the university's efforts to build a strong overall sense of community.

Transition and Summary of Section 2

Section 2 discusses how data will be collected and analyzed. This quantitative, correlational study is attempting to determine if a relationship exists between the use of university-sponsored social media and students' CSCI scores, and between the use of social media and reenrollment status. Social media usage data was combined with registrar's office enrollment status data and the university's online student demographic data. The CSCI is a validated scale that assesses the student's sense of community and belonging. In the early summer semester of 2018, the university polled all online students who were enrolled during the spring semester using a survey sponsored by the school's Institutional Effectiveness department. These results were matched to students' usage of university-sponsored social media and to their fall, 2018 enrollment status.

Section 3: Application to Professional Practice and Implications for Change

Section 3 describes the results of the study. Statistical analysis was conducted on both the enrollment data and the survey data, and the hypotheses were tested. Section 3 also contains the conclusions about the relationships between social media use and online students' sense of belonging and subsequent retention. Applications to the professional practice of marketing and objectives for further research are proposed.

Overview of the Study

The purpose of this quantitative study was to examine online students' actual social media use and relate this use both to students' sense of belonging or community and to retention in a subsequent semester. Data for this study were provided from the registrar's databases and from an online survey that was put to all current online students (>60k) of a single university during the spring 2018 semester. Registration data and survey responses were combined with demographic data from the university's database, then matched with individual student usage of three university-sponsored social media channels during the spring 2018 semester.

Rovai's student retention decision model (2003) was the framework for the study. Rovai proposed several factors influencing retention, including the student's sense of belonging or community. For geographically spread online students, social media may provide a means to connect and form relationships with other students, faculty and staff which may contribute to a sense of belonging or community and positively influence subsequent retention.

This section presents a review of the research questions, the associated data and conclusions. It also includes descriptive statistics of the overall online student body at the university, national averages (when available) for online students, and the survey participants.

Presentation of the Findings

Online student demographics. The table below shows demographics for the university's online student body during the spring 2018 semester.

Table 5

Study Institution's Online Student Demographic

	Spring 18 Student Pop.		Spring 18 Student Pop.
Female	60%	Married	38%
White	43%	Single	18%
Black	16%	Divorced	4%
Asian	1%	Active/Veteran	22%
Hispanic	5%	Transferred In	55%
Full-time	41%	Avg. GPA	3.1
USA Citizenship	98.5%	Avg. Age	36

Comparison of survey responders versus overall spring population. The table below compares the demographic characteristics of the institution's online student population during the spring semester and the subset of students who completed the online survey. Most demographic characteristics were similar between the two groups but several differed. Females were overrepresented in the survey group (68.5%) versus the spring semester 2018 student population (60%). The average age of survey respondents (40 years) was 11% higher than the population as a whole (36 years). More active duty military and veterans completed the survey (32%) than were represented in the online student body during the spring (22%). While 55% of the student population transferred credits to the university, only 42% of the survey group were transfer students. Fewer full-time students completed the survey (38%) versus the spring student

population (41%). 48% of students who completed the survey identified their race as White, which is five percentage points more than the overall population (43%). The ratios of other race groups (Black; Asian; Hispanic) were identical or showed little difference between groups. 35% of the overall population and 31% of the survey group had not identified their race. Other demographic characteristics (e.g. nationality; marital status) were identical or had only minor differences between groups.

Table 6

Profile of Student's Online Student Population

	Total	Survey		Total	Survey
Total Students	60,081	6,795	Divorced	4%	5%
Female	60%	69%	Married	38%	37%
Avg. Age	36	40	Single	18%	15%
US Citizens	98.5%	99.4%	Military (Act/Vet)	22%	32%
White	43%	48%	GPA	3.1	3.2
Black	16%	15%	Full-time	41%	38%
Asian	1%	1%	Transfer	55%	42%
Hispanic	5%	5%	Retained	66.4%	66.7%

The table below compares the demographics of students who were retained versus those who were not, and shows the retention rate of undergraduates, graduate students and doctoral students relative to the undergraduate retention rate. The largest demographic difference between retained and not retained was for full-time students who were more likely to be retained than were part-time students.

Table 7

Profile of Spring Online Student Population

	Retention Rate (Index vs. Undergraduate)				
Doctoral	118				
Graduate	94				
Undergraduate	100				
	Retained Group	Not Retained		Retained Group	Not Retained
Female	60%	57%	Military(Act/Vet)	35%	40%
Avg. Age	36	35	Avg. GPA	3.3	2.5
US Citizens	98.4%	98.5%	Married	37%	33%
White	43%	39%	Single	17%	18%
Black	16%	19%	Divorced	4%	4%
Asian	1%	1%	Full-time	47%	27%
Hispanic	5%	4%	Transfer	45%	43%

Research Questions and Supporting Data

The research questions examine the relationship between retention and usage of university-sponsored social media and the relationship between usage of university-sponsored social media and the student's sense of belonging and community. Given the role of social integration in higher education retention models (Kerby, 2015; Rovai A. P., 2003; Tinto, 1975; Kember, 1989), this study attempts to determine if social media use is positively or negatively associated with the online student's sense of community and belonging, and to determine if use

of university-sponsored social media is positively or negatively associated with the online student's decision to reenroll in a subsequent term.

Several higher education retention models conclude that social factors and social integration influence students' retention decisions (Kerby, 2015; Rovai A. P., 2003; Tinto, 1975; Kember, 1989). Social factors and integration include students' academic and non-academic relationships with faculty, staff and other students as well as participation in on-campus, non-academic events. Social integration outcomes, defined as a sense of community or belonging, are known to contribute positively to the likelihood that online students will continue their studies (Bawa, 2016).

Social media has been proposed as a possible means of contributing to the formation of the sense of community and social belonging for online students to form relationships with members of the university community (Bawa, 2016; Fagioli, Rios-Aguilar, & Deil-Amen, 2015). Online students often lack on-campus opportunities to connect to others informally, to stay abreast of the life of the campus community, and to directly acquire first-hand experience with the university's buildings, athletic teams, library, etc. (Clark, Fine, & Scheuer, 2017).

The research questions, hypotheses, and data follow:

RQ1: Does engagement with the university's social media affect the likelihood that an online student will be retained?

H1₀: There is no relationship between students' utilization of university-sponsored social media during the spring semester and retention in the fall semester of 2018.

To investigate whether students who used university-sponsored social media during spring semester 2018 differ in their retention rate for the fall 2018 semester, a series of Pearson chi-square statistics were computed for several demographics. Assumptions for use of chi-

squared (relatively large sample size; expected counts in 80% of the cells should be greater than five) were checked and were met except where noted. Because both variables were binary (user/non-user of social media; retained/not retained) and alternatives were not rare (except where noted), an odds ratio (OR) was computed.

Social media users versus non-users overall. Users of social media were more likely than expected under the null hypothesis to be retained at a different rate than were non-users. The table below indicates that social media users were significantly different on whether or not they reenrolled ($\chi^2 = 19.774$, $df = 1$, $N = 54,268$, $p < .001$). The OR was 1.18, indicating the odds of non-user students not being retained were 1.18 times as high as the odds for those who did use social media. The 95% confidence interval was 1.098 to 1.272.

Table 8

Chi-square Analysis of Reenrollment among Users and Non-users of Social Media

Variable	N	Fall 2018 Status (Difference vs. Group Avg.)		χ^2	p
		Not Retained	Retained		
Social Media				19.774	< .001
User	3,317	- 9.4%	+ 5.8%		
Non-user	50,951	+ 0.8%	- 0.5%		

Gender. Female users of social media were more likely than expected under the null hypothesis to be retained at a different rate than were non-users. The table below indicates that female social media users were significantly different on whether or not they reenrolled ($\chi^2 = 22.771$, $df = 1$, $N = 32,295$, $p < .001$). The OR was 1.25, indicating the odds of female non-user

students not being retained were 1.25 times as high as the odds for those who did use social media. The 95% confidence interval was 1.141 to 1.371.

Table 9

Reenrollment among Users and Non-users of Social Media by Gender

Variable	N	Fall 2018 Status (Difference vs. Group Avg.)		χ^2	p
		Not Retained	Retained		
Social Media - Female				22.771	< .001
User	2,209	- 12.6%	+ 7.5%		
Non-user	30,086	+ 1.1%	- 0.6%		
Social Media - Male				.553	.457
User	1,105	- 9.4%	+ 1.7%		
Non-user	20,769	+ 0.3%	- 0.2%		

Full-time or part-time status. Full-time, but not part-time, users of social media were more likely than expected under the null hypothesis to be retained at a different rate than were non-users. The table below indicates that full-time social media users were significantly different on whether or not they reenrolled ($\chi^2 = 19.189$, $df = 1$, $N = 21,774$, $p < .001$). The OR was 1.317, indicating the odds of full-time, non-user students not being retained were 1.32 times as high as the odds for full-time students who did use social media. The 95% confidence interval was 1.164 to 1.491.

Table 10

Reenrollment among Users and Non-users of Social Media Users by Gender

Variable	N	Fall 2018 Status (Difference vs. Group Avg.)		χ^2	<i>p</i>
		Not Retained	Retained		
Social Media – Part-time				.086	.770
User	1,768	- 0.9%	+ 0.7%		
Non-user	30,726	0.0%	0.0%		
Social Media – Full-time				19.189	< .001
User	1,105	- 9.4%	+ 1.7%		
Non-user	20,225	+ 0.3%	- 0.2%		

Generation. The age groupings Gen Z, Millennials, and Gen X, but not Boomers or the Silent generation, who used social media were more likely than expected under the null hypothesis to be retained at different rates than were non-users. In the table below, the results for Gen Z ($\chi^2 = 10.409$, $df = 1$, $N = 2,204$, $p < .001$), Millennial ($\chi^2 = 12.687$, $df = 1$, $N = 29,965$, $p < .001$), and Gen X ($\chi^2 = 7.908$, $df = 1$, $N = 17,558$, $p = .005$), indicate social media users were significantly different on whether or not they were retained. The OR for Gen Z was .565 (95% CI was .396 to .803) indicating social media usage reduced the odds of retention versus non-using Gen Z students. The OR for Millennial students was 1.228 (95% CI was 1.097 to 1.376) indicating the odds of non-user students not being retained were 1.228 times as high as the odds for students who did use social media. The OR for Gen X students was 1.165 (95% CI was 1.053 to 1.334) indicating the odds of non-user students not being retained were 1.165 times as high as the odds for students who did use social media.

Table 11

Reenrollment among Users and Non-users of Social Media by Generation

Variable	N	Fall 2018 Status (Difference vs. Group Avg.)		χ^2	p
		Not Retained	Retained		
Gen Z (age 20 years or less)				10.409	<.001
SM Non-user	2,070	-2.4%	+1.4%		
SM User	134	+34.5%	-20.9%		
Millennial (age 21-37)				12.687	< .001
SM Non-user	28,608	+0.5%	-0.3%		
SM User	1,377	-11.7%	+7.6%		
Gen X (are 38-53)				7.908	.005
SM Non-user	16,227	0.8%	-0.5%		
SM User	1,331	-9.5%	+5.6%		
Boomer (54-72)				2.133	.144
SM Non-user	3,980	+1.1%	-0.6%		
SM User	466	-8.6%	+4.9%		
Silent (73-90)				.221	.638
SM Non-user	65	+2.5%	-1.7%		
SM User	9	-17.8%	+12.1%		

Transfer status. Transfer students, but not non-transfer students, who used social media were more likely than expected under the null hypothesis to be retained at a different rate than were non-users. The table below indicates that transfer students who used social media were significantly different on whether or not they were retained ($\chi^2 = 36.600$, $df = 1$, $N = 24,186$, $p < .001$). The OR was 1.448, indicating the odds of transfer, non-user students not being retained

were 1.448 times as high as the odds for those who did use social media. The 95% confidence interval was 1.282 to 1.637.

Table 12

Reenrollment among Social Media Users and Non-users of Social Media by Transfer Status

Variable	N	Fall 2018 Status (Difference vs. Group Avg.)		χ^2	<i>p</i>
		Not Retained	Retained		
Non-transfer student				1.291	.259
SM Non-user	28,078	+0.3%	-0.2%		
SM User	2,004	-3.0%	+2.0%		
Transfer student				35.600	< .001
SM Non-user	22,873	+1.1%	-0.6%		
SM User	1,313	-21.3%	+12.3%		

Marital status. Married students who used social media were more likely than expected under the null hypothesis to be retained at different rates than were non-users. The table below indicates married students who were social media users were significantly different on whether or not they were retained ($\chi^2 = 21.866$, $df = 1$, $N = 20,252$, $p < .001$). The OR for married students was 1.445 (the 95% CI was 1.237 to 1.687) indicating the odds of non-user students not being retained were 1.445 times as high as the odds for students who did use social media.

Table 13

Reenrollment of Users and Non-users of Social Media by Marital Status

Variable	N	Fall 2018 Status (Difference vs. Group Avg.)		χ^2	p
		Not Retained	Retained		
Single				1.624	.202
SM Non-user	9,344	+0.5%	-0.3%		
SM User	292	-8.8%	+6.1%		
Married				21.866	<.001
SM Non-user	19,471	+0.8%	-0.5%		
SM User	781	-20.8%	+13.0%		
Divorced				.620	.431
SM Non-user	1,914	+0.3%	-0.2%		
SM User	91	-10.6%	+6.2%		
Widowed				3.097	.078
SM Non-user	255	+3.9%	-2.2%		
SM User	18	-53.5%	+30.0%		
Unknown				1.141	.285
SM Non-user	19,967	+0.3%	-0.2%		
SM User	2,135	-2.7%	+1.6%		

Veteran status. Non-veterans who used social media were more likely than expected under the null hypothesis to be retained at a different rate than were non-users. The table below indicates that non-veterans who used social media were significantly different on whether or not they were retained ($\chi^2 = 20.679$, $df = 1$, $N = 46,636$, $p < .001$). The OR was 1.204, indicating the

odds of non-veteran, non-user student not being retained were 1.204 times as high as the odds for those who did use social media. The 95% confidence interval was 1.111 to 1.305.

Table 14

Reenrollment of Users and Non-users of Social Media by Veteran Status

Variable	N	Fall 2018 Status (Difference vs. Group Avg.)		χ^2	p
		Not Retained	Retained		
Non-veteran				20.679	<.001
SM Non-user	43,822	+0.8%	0.0%		
SM User	2,814	-10.4%	+6.5%		
Veteran				.404	.525
SM Non-user	7,129	+0.3%	-0.2%		
SM User	503	-3.5%	+2.1%		

Class level. Undergraduate, but not graduate or doctoral, students who used social media were more likely than expected under the null hypothesis to be retained at different rates than were non-users. The table below indicates undergraduate students who were social media users were significantly different on whether or not they were retained ($\chi^2 = 5.168$, $df = 1$, $N = 27,613$, $p = .023$). The OR for undergraduate students was 1.133 (the 95% CI was 1.017 to 1.262) indicating the odds of non-user students not being retained were 1.133 times as high as the odds for students who did use social media.

Table 15

Reenrollment of Users and Non-users of Social Media by Class Level

Variable	N	Fall 2018 Status (Difference vs. Group Avg.)		χ^2	p
		Not Retained	Retained		
Undergraduate				5.168	.023
SM Non-user	26,055	+0.3%	-0.2%		
SM User	1,558	-7.4%	+4.3%		
Graduate				3.595	.058
SM Non-user	20,563	+0.5%	-0.3%		
SM User	1,395	-5.9%	+4.1%		
Doctoral				.084	.772
SM Non-user	3,682	-0.4%	+0.1%		
SM User	231	+3.2%	-1.1%		

GPA. Students with a cumulative GPA of C or above and who used social media were more likely than expected under the null hypothesis to be retained at different rates than were non-users. The table below shows the results of the analysis. Students averaging a letter grade of C ($\chi^2 = 6.040$, $df = 1$, $N = 7,089$, $p = .014$), B ($\chi^2 = 31.581$, $df = 1$, $N = 19,427$, $p < .01$) and A ($\chi^2 = 58.813$, $df = 1$, $N = 23,501$, $p < .01$) were significantly different on whether or not they were retained. The OR for C students was 1.307 (the 95% CI was 1.055 to 1.618) indicating the odds of non-user students not being retained were 1.307 times as high as the odds for students who did use social media. The OR for B students was 1.535 (the 95% CI was 1.321 to 1.784) indicating the odds of non-user students not being retained were 1.535 times as high as the odds for students who did use social media. The OR for A students was 1.622 (the 95% CI was 1.434

to 1.848) indicating the odds of non-user students not being retained were 1.622 times as high as the odds for students who did use social media

Table 16

Reenrollment of Users and Non-users of Social Media by GPA

Variable	N	Fall 2018 Status (Difference vs. Group Avg.)		χ^2	<i>p</i>
		Not Retained	Retained		
A students				58.813	<.01
SM Non-user	22,089	+1.7%	-0.7%		
SM User	1,412	-28.9%	+12.5%		
B students				31.581	<.01
SM Non-user	18,493	+1.2%	-0.6%		
SM User	934	-25.1%	+12.9%		
C Students				6.040	.014
SM Non-user	6,722	+0.9%	-0.8%		
SM User	367	-13.3%	+11.7%		
D Students				.420	.517
SM Non-user	3,465	+0.2%	-1.4%		
SM User	591	+1.1%	+6.2%		

Race. The analysis also addressed the variable *student race* and found no significant differences between races.

This table summarizes the results of the analysis.

Table 17

Summary

Demographic	Hypothesis	Correlation	Power
Social media user and	Rejected	Positive	.999
Undergraduate	Rejected	Positive	.607
Graduate	Failed to Reject		
Doctoral	Failed to Reject		
Social media user and			
Female	Rejected	Positive	.998
Male	Failed to Reject		
Full-time student	Rejected	Positive	.994
Part-time student	Failed to Reject		
Gen Z	Rejected	Negative	.889
Millennial	Rejected	Positive	.949
Gen X	Rejected	Positive	.794
Boomers	Failed to Reject		
Silent Generation	Failed to Reject		
Transfer student	Rejected	Positive	.999
Non-transfer student	Failed to Reject		
Single	Failed to Reject		
Married	Rejected	Positive	.997
Divorced	Failed to Reject		
Widowed	Failed to Reject		
Unknown marital status	Failed to Reject		
Veterans	Failed to Reject		
Non-veterans	Rejected	Positive	.996

Logistic regression. Logistic regression was conducted to assess whether the predictor variables *class level, grade, generation, full or part-time status, gender, marital status* and *social media use* significantly predicted whether a student was retained in fall semester, 2018. The assumption of observations being independent was met and multicollinearity among the variables was low. When four of the predictor variables are consider together, they significantly predict whether or not a spring 2018 student will be retained in the fall 2018 semester ($X^2 = 4926.54$, $df = 10$, $N = 53,974$, $p = < .01$). The table below presents the odds ratios, which suggest the odds of being retained in the fall 2018 semester increase as GPA and age increase, and for full-time students or students who use social media.

Table 18

Logistic Regression Predicting Who Will be Retained

Variable	B	SE	Odds ratio	<i>p</i>
GPA	.527	.010	1.694	< .01
Age	.111	.014	1.118	< .01
Full-time	.874	.020	2.396	< .01
Social media user	.197	.034	1.217	< .01

Permutation test. The relationship between social media use and subsequent retention was also examined using the Permutation test, performed using the Statistical Package R. 10,000 random groups of approximately 3000 students, the number observed to have used university-sponsored social media, were drawn and the difference in the proportion of students reenrolling for users versus nonusers of social media was calculated. There were zero of the randomly drawn groups with the same or greater difference in retention rates as the observed test statistic (3.9 percentage points), yielding a significance of $p < 0.01$ and allowing the researcher to reject the

null hypothesis. The conclusion is that the difference in reenrollment rates between users and nonusers of social media is unlikely to be the result of random variation.

RQ2: Does engagement with the university's social media affect the student's sense of community/belonging?

H2₀: There is no relationship between students' utilization of university-sponsored social media and the student's CSCI score.

A Mann-Whitney U test revealed a significant difference in CSCI scores between users (Median =26, n =534) and non-users (Median = 25, n = 3009) of university-sponsored social media, $U = 722,993$, $z = -3.696$, $p < 0.01$, $r = 0.06$. The r value is considered a very small effect size using Cohen's (1988) criteria.

Table 19

Median Sub-scale Scores

	School Form	Median CSCI Score	
		Learning sub-scale	Social sub-scale
Social media user	26	17	9
Social media non-user	25	17	8

Summary of the findings. Usage of university-sponsored social media was found to be positively related to retention and to the student's sense of community and belonging. The following table summarizes the results of the statistical tests:

Table 20

Summary of Tests

H ₀ : No Relationship Between:	Data set	Test Statistic	Significance
Social media use and fall 2018 retention	Online population	Chi-squared test	Significant, $p < 0.01$
		Logistic regression	Significant, $p < 0.01$
		Permutation test	Significant, $p < 0.01$
Social media use and CSCI score	Survey responders	Mann-Whitney U test	Significant, $p < 0.01$

Relationship to Rovai's retention model. The many retention factors contained in Rovai's (2003) online student retention model are organized into three categories: student characteristics and skills; internal factors; external factors. The elements interact in a process that, over time, leads to the student's decision to persist or drop out. Some retention factors are not under direct control of the university, such as the student's study skills, intellectual development and academic preparation. Others can be influenced or controlled by the university such as academic advising, the social environment and opportunities to socially interact, and pedagogy. Social integration is a common factor across the several models of student retention, including Rovai's 2003 model (Kerby, 2015; Rovai A. P., 2003; Tinto, 1975; Kember, 1989). Social integration opportunities range from physical attendance at extra-curricular, on-campus events, face-to-face student friendships and interactions outside of class, to non-academic interactions with staff and faculty. Social integration contributes to the sense of community or belonging felt by the student toward the school as a whole, and has been assessed using the Classroom and School Community Inventory (CSCI), developed by Rovai, Wighting and Lucking (2004).

Social media channels. This study used actual social media usage data from a university's database of student usage of two university-controlled social media channels (Blackboard non-term discussion boards; Yammer groups. These data were combined with Facebook page usage data provided by a third-party data vendor then appended with fall registration status and student demographics. The usage data for Yammer and Blackboard spanned the entire spring semester while the Facebook data was from usage during approximately two months from the beginning of the semester. A limitation of this study was that the university was unable to capture students' visits to a social media page, group or board if the visit did not result in the student posting, responding to another's post, or taking an action such as liking or sharing a post in response to viewed content. Visitors who do not interact are often referred to as *Lurkers*. It is not known whether lurking on social media has the same effect on students as active participation in the online population but lurking on schools' Facebook pages has been shown to increase persistence in a community college setting (Fagioli, Rios-Aguilar, & Deil-Amen, 2015).

Yammer. Yammer discussion groups were available to all current students as part of the Microsoft Office 365 software package provided to online students. Active or passive participation through Yammer was not required. If the online student discovered Yammer, they would have encountered a large number of existing groups (>400). Any Yammer user can establish a group, and many Yammer groups have been established by students pursuing a specific major or by students with similar interests such as music, a sport or other avocation, or by students from a specific geography. With only a few exceptions, groups are started by students, not the university. Those started and managed by the university had specific objectives. For example, one group (Introduce Yourself) is a venue for the online student to introduce him

or herself to other online students. University-sponsored groups also provided academic-related support (example: Study Tips) and emotional or spiritual support and encouragement through the groups *Prayer Requests*, *Online Student Life* and *Daily Encouragement* with the end goal of influencing retention directly with moral support and encouragement or by calling attention to student support services provided by the University of which students may have been unaware.

Facebook. Facebook page engagement was accessed from a third-party vendor and matched to the university's internal student database for demographic and enrollment data. Because matching was only contingent on the student's name and because many students share the same name, the Facebook usage data was not completely matched to the current student database, meaning some student interactions with the Facebook page were not recorded. Also, the span of time that Facebook data was collected was for eight weeks beginning at the start of the spring semester while the span of data collection for Yammer and Blackboard was for the entire 16 weeks of the semester. A Facebook *engagement* included liking, sharing or following the page, commenting on a university post, replying to another student's comments or posts, or the use of an emoticon.

Blackboard. Blackboard discussion group engagement data was provided from an internal database. The university establishes a new *Blackboard Non-term Discussion Board* each semester, and all first-time students are automatically enrolled as a cohort without respect to program, level or any other student characteristic. Within the non-term discussion board, the university establishes individual sub-discussion boards, each with a single focus (examples: Study Tips; Prayer Requests; Daily Encouragement). Students are not required to post (or monitor) Blackboard (or any other) discussion board.

Applications to Professional Practice

Social media and brands. Social media has changed the way business is able to communicate with customers. Social media channels and web pages, versus traditional media, such as television, radio and newspapers, give business the ability to conduct personalized and interactive communications with customers who are physically remote. Zhang and Lin (2015) state this functionality will revolutionize marketing, and claim this increased interactivity between brands and consumers leads to more rapidly formed relationships and subsequent loyalty. Social media has also been shown to have a positive effect on customer satisfaction in addition to loyalty (Nisar & Whitehead, 2016). In another study (Gummerus, Liljander, Weman, & Pihlstrom, 2012) analyzed behaviors of visitors to a Facebook brand community, and found that any form of behavioral engagement, such as liking a post or the page or writing comments in response to a post, positively contributed to relationship formation with the business and subsequently contributed to brand loyalty. They go further by concluding the types of communications that maximize engagement are posts that entertain, posts for formats that provide a means for customers to digitally socialize (i.e. the ability for customers to post or to respond to other customer's posts, not just to the business' posts).

Social media and higher education. Social media has also changed the way students interact and connect with the university and its departments, with professors and staff, and with other students. Universities use social media to recruit new students, to further branding objectives, and communicate with current students providing time-sensitive information or further academic and non-academic student development. The rapid growth of online degree enrollments is evidence of how the internet has created value for distance students. Interaction with the university need not be face-to-face, nor need it occur simultaneously between the

student and the institution, as asynchronous engagement is the norm, not the exception. (Bettinger, Liu, & Loeb, 2016).

Writing about distance learners, Rovai (2002) states:

Students with a strong sense of community are more likely to be retained than those who feel alienated and alone. One strategy to help increase retention is to provide students with increased affective support by promoting a strong sense of community (p. 12).

A study by Sidelinger, Frisby and Heisler (2016) reinforces the importance of social integration and sense of community on student success and persistence. They hypothesize that students who established some measure of rapport with instructors tended to be more likely to access student support services. This, in turn, may have been the causality resulting in better outcomes. Neier and Zayer (2015) studied social media usage in higher education and concluded that the most important motivation for students to engage with social media was for social integration and feelings of integration with the university. "...students expressed that social media in education is a way to connect with classmates, instructors, and others in their social circles..." (p. 140).

The students viewed social media as a facilitator of conversations, and they valued the sense of connection with classmates and the instructor, again displaying the value of social integration.

Bettinger, Liu, And Loeb (2016) examined using social media as a channel for student interaction and subsequent connection to performance and persistence in individual online courses. There was evidence in their study that a stronger sense of peer presence in an online medium is related to both student satisfaction and persistence in online learning. The authors state that student-to-student interactions increased the probability of passing a course, improved the participants' grades within the course, and increased the likelihood of the participants

enrolling in the next semester. The interaction effect was strongest for students who would have been less likely to have engaged in online discussions.

Studying social media and residential students, Clay (2014) found statistically significant relationships between the amount of time students reported they spent on Facebook and their social integration in a study of 136 first-year students at a small private university. However, Clay did not find significant correlation between Facebook use and students' intentions to reenroll. Clay used a survey to collect student self-reported social media use but lacked access to actual social media usage data. Spells (2014) studied social media use among 364 students of a suburban community college. Spells found significant relationships between social media use and social integration but did not find a significant relationship between social media use and persistence. Spells also only had access to student-reported social media usage data, not actual usage. Ruud (2013) studied traditional college students (i.e. college-aged and residential) and found significant relationships between use of Facebook and feelings of belonging as a student of the university but did not examine the relationship between reported social media use and retention.

In the first study to use actual (non-self-reported) Facebook usage data, Fagioli, Rios-Aquilar and Deil-Amen (2015) used a Facebook application created for higher education to study the relationship between Facebook usage and academic outcomes (i.e. GPA) and persistence. In a large study spanning several community colleges and thousands of students, the researchers used Facebook's *Schools App* to record actual usage of Facebook. The Schools App allowed schools to fit customized information to a preformatted template and to provide space for student-to-student interaction or interaction with the school itself. The Schools App also permitted the researchers to differentiate between active student users, who posted or replied to

posts and passive users who visited the site only, and non-users who were enrolled in the Schools App by the school to the site but never accessed it. They concluded that students with either passive or active online engagement were more likely to persist, with increases ranging from 26% to 70% more likely to reenroll. These findings are possibly more relevant to online students because community colleges, like institutions providing online higher education, enroll a higher percentage of non-traditional (i.e. older than 22; live off campus; work full-time) students than residential institutions. Their findings are also important because they are contrary to the general belief that passive users of social media are actually disengaged from the online community.

Content strategy. Though this study did not attempt to understand how the nature of the content delivered through the university-sponsored social media might influence CSCI scores and retention, a review of the University's posting content gives anecdotal insights. This university tended to focus its content on three objectives. First, they attempted to encourage online students to persist in their studies through the posting of Bible verses or other motivational sayings, and through short videos or blogs from other online students who would relate their personal stories of persevering to overcome trials and barriers. Second, the University promoted awareness of supporting resources made available to online students, such as the online writing center, online tutoring, or how-to-research seminars conducted by the online library staff. Third, they posted pictures of the residential campus and other university-iconic imagery (e.g. the sports team mascot) in an attempt to invoke a sense among online students that "this is your campus, too." To maximize engagement, posts were often connected with contests where participating students might earn an item of nominal value branded with the school's logo with the reasoning that these items increase the student's sense of belonging, therefore contributing to retention. This tactic was based on a study that showed online students who had

acquired a student identification card had a higher sense of belonging and identity as a student (Lehman & Conceicao, 2014).

The posts that induced the highest amount of engagement among online students were *Monday Motivation* posts. There were Bible verses or inspirational quotes from prominent sources or individuals. They often related directly to the challenges faced by online students such as feeling isolated, anxiety of returning to school after many years, and managing work, family and school. Content often consisted of other online students relating personal stories of trials and difficulties while pursuing an online degree. These were posted as blogs or short selfie-videos. The university also interspersed humorous posts which highlighted pain points or trying experiences of online students such as group projects or discussion boards. Content that was not obviously the contribution of another online student was usually attributed to one of the individuals on the university's social media team, versus an alias or their department's name. The department did this, and social media managers also frequently referred to their own experiences as online students, in an attempt to establish credibility and rapport with current online students.

Recommendations for Action

Retention is predicated on many factors, some of which can be influenced by the university. Some factors may be practical for residential students but infeasible or impractical for online students. For example, Residential Advisors, commonly found on each floor of a residential dorm, are ideally positioned to form relationships and support retention, while providing the same level of interaction for online students would be difficult. In addition, online students differ from residential students demographically and psychographically. Successful

integration strategies for residential students may not be successful when used with online students.

Communication between the student and the university and its staff and faculty is an important factor in the integration of all students, including online students. Social media is an emerging communication channel that could be leveraged to build and sustain the budding relationship between the new online student and the university. A social media strategy should be one element of an integrated retention effort for online students. Student recruitment and institution branding already make use of social media, and presumably, have established some level of student-to-university relationship with new online students. Unless these relationships are formally handed-off to academic or administrative departments with the expectation that resources will be committed to deepening the relationship, the university risks a gradual atrophying of the sense of belonging and will have a reduced opportunity to ensure academic interventions such as tutoring are made available when most needed by the online student.

Universities should also make full use of the technical capabilities of social media. Social media and Web 2.0 permit direct two-way interaction between parties via the internet through social media applications such as Facebook, Twitter and Instagram. Social media is not simply “the new advertising” but is a venue that engages its users to produce content and to have student-to-student interactions that do not even involved the university. Other uses of social media include application in customer relationship management (possibly an entirely new paradigm for online higher education – a Google search for “CRM in online education” yielded no hits). CRM focuses on the customer (student) after the first sale (enrollment). “Social CRM...includes the collective intelligence of a firm’s customers to more finely tune the offer and build intimacy” (Tuten & Soloman, 2015, p. 30). Most universities already possess large

amounts of personalization data in their existing databases resulting from the application process, and these data might be used during the college experience to further a sense of belonging, not just used with prospects before enrollment or after graduation with alumni.

As acceptance and use of social media continues to grow, responsibility for the day-to-day operations of institution-sponsored social media channels should migrate to the (potential) content originators to avoid becoming just another form of advertising. Said differently, since social media represents a way to scale individual-to-individual communications, the university's professors and staff members, and especially other students, not a handful of designated people within a marketing department, are the most impactful sources of student engagement and should assume responsibility or be managed to produce content in order that the full potential of the medium may be realized for social integration in an online university setting.

Recommendations for Further Study

Though the relationships between social media usage and sense of community and subsequent retention were significant, the effect size was small. Given a large number of factors influencing retention, the relative brevity of this study, and the large sample size, this was not unexpected. This study also relied upon a convenience sample (to obtain the CSCI score), and was limited to approximately 60 thousand online students of a single term from a single university to examine retention. Convenience samples may not accurately reflect the true nature of the population being studied, nor does the population of online students at a single university permit inferring conclusions beyond the students of the spring semester. Consequently, the researcher cannot broadly infer conclusions to the online students of other semesters, other schools, or the online student population as a whole. Further research using an experimental design would add to the understanding of social media and its relationship to retention in online

higher education. A quantitative study design that selected online students at multiple institutions, then focused on gaining utilization of social media to achieve different levels of engagement, would help answer critical questions about student predisposition to being influenced by social media, the length of time over which the contact needs to occur, the volume or frequency of contact, the effect resulting from different sources of contact (other students, staff, faculty or the university at large), and the types of social media content (encouragement; humor; information; promotion of supporting resources; etc.) having the most impact. As with person-to-person relationships, relationships conducted through social media are not formed immediately, which results in a delay of any subsequent impact on retention, social integration, or attitudes toward the university. Therefore, additional study is needed over a longer timeframe and incorporating additional variables to determine if a larger association with the sense of community and retention exists, and to further understand the total effect of social media in relation to the other factors that predict retention.

This study also did not examine *how* the institution used social media to interact with students. Social media content may take many different forms. It may report on the many activities ongoing on a typical residential campus with relatively large enrollment. Content may be designed to convey a sense of place using images of iconic buildings and spaces associated with the residential campus with the intention of helping online students acquire a sense of belonging on the physical campus. Content may be faculty-led and designed to engage online students in discussions or debates. Student-to-student interactions may be a high priority and comprise a significant amount of the total content. This study also did not examine the potential differences in impact based on the source of the social media content (other students; faculty; staff). Some content in this study originated with employees while other content came from

students. There may be differences in how students perceive the credibility of the content based on the source causing a differential impact on perceptions of belonging or retention. Little is known about the tactical aspects of using social media to drive social integration such as the frequency of posting and the social media channels chosen for maximum effectiveness, or if there is a tipping point for the volume of social media consumed before a statistically significant sense of belonging or retention may be observed, or if demographics of social media users influences their receptivity to social media used to promote retention.

Reflections

Social media research is still a relatively new area of inquiry in a business application, and the study of social media in higher education is more so still in its infancy. In higher education, social media is utilized to disseminate information, for outside-of-classroom student-to-student or student-to-instructor interaction, for branding, for building or maintaining relationships with alumni and donors, and for recruiting. There has been little investigation into its role in retention. Further, higher education's investment in social media seems to be driven by not wanting to be seen as out of touch or behind times by modern students (a.k.a. *Digital Natives*) than with a planned application of a new communication channel which is embodied with specific strengths and weakness and which may be brought to bear to solve a specific problem faced by higher education. As the investment and application of social media to the needs of higher education is growing in pace with the rise in social media spending overall, this "solution, looking for a problem" will eventually be resolved as best practices and data-based results emerge. This researcher believes social media will emerge as an important tool for the university, with a widely dispersed online student body, to build a sense of belonging and student

engagement, and will contribute to diminishing the transactional-based relationship between online students and their universities that is likely prevalent today.

Summary and Study Conclusions

The purpose of this quantitative study was to examine the relationship between online students' use of university-sponsored social media with a sense of belonging or sense of community felt by the student toward the school. This study also examined the relationship between social media use and the student's retention in a subsequent semester. Rovai's student retention decision model (2003) was the framework for the exploration of social media usage and its relationship to student attitudes toward their schools and programs and to their decisions to persist in their studies. Rovai's model details the many factors influencing retention into before and after admission, classifying them as student characteristics, student skills, external factors and internal factors. The factors interrelate during the student experience and culminate in the student's persistence decision.

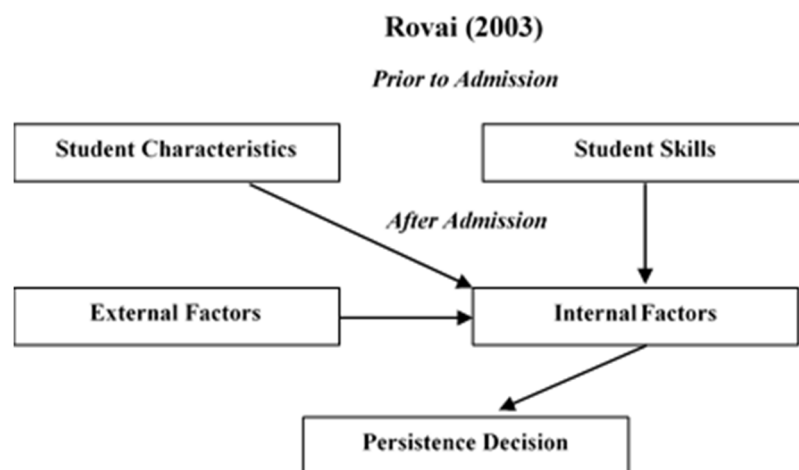


Figure 7. Rovai's Retention Model

At the end of the spring 2018 semester, all online students (>60,000) of the subject university were offered an opportunity to complete an online survey which included the

Classroom and School Community Inventory (CSCI), a validated scale measuring the student's sense of belonging and community. Over 7000 Students who completed the survey, but those who graduated after the spring term or were expecting graduation before the end of 2019 were removed from the analysis to reduce an expected favorable bias, both in the student's base attitudes toward the university and his or her likelihood of reenrolling.

It was found that among users of one or more social media channels, the median score on the CSCI was statistically higher than the median score of nonusers of the school's social media. This indicates students who actively participated, versus visiting the school's social media sites but taking no action, possessed a greater affinity with the school – the sense of belonging or being a member of the school's extended community. Users of the school-sponsored social media also enrolled at a higher rate than did non-users. However, social media use or non-use explained little of the overall variance in the CSCI or rate of reenrollment, which was not unexpected given a large number of variables impacting retention. Further study is indicated to quantify the relative impact of social media on retention, and to determine if the online student's sense of community created through social media yields a long term higher likelihood of retention.

Appendix A: Classroom and School Community Inventory

Below you will see a series of statements concerning life at your school at large. Read each statement carefully. Click the box to the right of the statement that comes closest to indicate how you feel about school life. There are no correct or incorrect responses. If you neither agree nor disagree with a statement or are uncertain, click the box labeled “neutral.” Do not spend too much time on any one statement, but give the response that seems to describe how you feel. Please respond to all items.

CSCI inventory question removed to comply with copywrite.


Appendix B: Permission to Use CSCI




Re: Request to use the CSCI - Message (HTML)


File Message ADOBE PDF Tell me what you want to do...

Delete Reply Reply All Forward Delete Move Tags Editing Zoom Boomerang Wunderlist Create Task MeisterTask

Fri 5/25/2018 11:44 AM

 Fred Rovai <aprovai@mac.com>
Re: Request to use the CSCI

To  Eaton, Gary (Office of Student Life)
Cc  Mervyn Wighting;  Fred Rovai

 You replied to this message on 5/25/2018 11:49 AM.

Action Items + Get more apps

Good morning, Gary.

You may use the CSCI for your research at Liberty University. Please reference the source journal article in any report you write.

Best wishes,

Alfred P Rovai, PhD
aprovai@mac.com

Sent from my iPhone

On May 25, 2018, at 11:20 AM, Mervyn Wighting <mervwig@regent.edu> wrote:

good morning Fred would you like to respond to this person?
happy memorial weekend!

Dr. Mervyn Wighting
School of Education

Sent by iPhone while on the move so please excuse any format errors

Begin forwarded message:

From: "Eaton, Gary (Office of Student Life)" <geaton@liberty.edu>
Date: May 25, 2018 at 10:51:07 AM EDT
To: "mervwig@regent.edu" <mervwig@regent.edu>
Subject: Request to use the CSCI

Greetings Dr. Wighting,
I'm a DBA candidate researching the correlation between school-sponsored social media and the sense of community among online higher education students. I believe the CSCI developed by you, Dr. Rovai, and Dr. Lucking is the right instrument. May I have your permission to use it?

Sincerely,
Gary Eaton

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