ASSOCIATION OF BUSINESS INFORMATION SYSTEMS

2016 REFEREED PROCEEDINGS

FEDERATION OF BUSINESS DISCIPLINES

March 2016
Oklahoma City, Oklahoma

ASSOCIATION OF BUSINESS INFORMATION SYSTEMS

2016 Refereed Proceedings

Oklahoma City, Oklahoma

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CONGRATULATIONS!

Recipient of the 2016 McGraw-Hill Education Distinguished Paper Award

Developing Data Analytics Skill in a Business Computer Applications Course

Robert B. Mitchell, University of Arkansas at Little Rock
Ravi Thambusamy, University of Arkansas at Little Rock

Recipient of the 2016 FBD Outstanding Educator Award

Jim Larsgaard, Eastern Kentucky University

ASSOCIATION OF BUSINESS INFORMATION SYSTEMS

March 10, 2016
(Thursday)

7:30 a.m. – 8:30 a.m. Ballroom B

ABIS and ABC – SWUS Joint breakfast

All ABIS and ABC – SWUS presenters and members are invited to enjoy a delicious breakfast

Association Name Badge Required for Attendance at Breakfast

8:30 a.m. – 10:00 a.m. Meeting Room 15

Responding to Students

Session Chair: **Jim Larsgaard, Eastern Kentucky University**

Faculty Have Lives Too! -- Differing Opinions on Appropriate Response Times in Online Classes
Ashley Hall and Susan Evans Jennings, Stephen F. Austin State University

ABIS Business Meeting

10:00 a.m. – 10:30 a.m. Ballroom C

FBD Coffee Break

Please make plans to visit the exhibits for information on the latest books and newest educational technologies. Let our exhibitors know how much we appreciate their presence and continued support! Great Door Prize Drawings take place at **10:15 a.m.** in the Exhibit Area. *Must be present to win.*

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All FBD Conference participants are eligible to have their work considered for the low submission fee of $40.

ASSOCIATION OF BUSINESS INFORMATION SYSTEMS

March 10, 2016
(Thursday)

10:30 a.m. – 12:00 p.m. Meeting Room 15

The Challenges of Online Learning & Technology

Session Chair: **Wanju Huang**

The Cyclical Relationship Between Online Learning and Face-to-Face Learning
Wanju Huang, Eastern Kentucky University

Traditional, Blended or Online: Creative implementation of video conferencing to enhance adult learning environments
Karen Hardin, Cameron University

What Does Wikipedia Think of Business Communication?
Clive Muir, Stephen F. Austin State University

SME-Peer Learning: A Continuous Improvement Process
Marcia Hardy, Northwestern State University of Louisiana
Margaret Kilcoyne, Northwestern State University of Louisiana
Begona Perez-Mira, Northwestern State University of Louisiana

Enhancing Online Lower Division Course Student Learning Outcomes-It's Not All About the Content and the Delivery!
Jim Larsgaard, Eastern Kentucky University

Noon – 1:30 p.m. **Lunch on your own**

1:30 p.m. – 3:00 p.m. Meeting Room 15

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Session Chair**: Sherry Rodrigue**

Trends: An Examination of an Online Business Course
Marsha Bayless, Stephen F. Austin State University
Carol Wright, Stephen F. Austin State University

Information Available for Prospective Online Students on University Websites
Sherry Rodrigue, Nicholls State University
Ronnie Fanguy, Nicholls State University
Lori Soule, Nicholls State University
Betty Kleen, Nicholls State University

Examining the Relationships of University Student Characteristics and Motivation in a Blended Digital Literacy Course Using the Keller Arcs Motivational Model
Shane Schartz, Fort Hays State University

March 10, 2016
(Thursday)

Session A of Focus on the Students (continued)

Freshman Interest Groups and Beyond
Brenda Hanson, Northwestern State University of Louisiana
Thomas Hanson, Northwestern State University of Louisiana

3:00 p.m. – 3:30 p.m. Ballroom C

FBD Coffee Break

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3:30 p.m. – 5:00 p.m. Meeting Room 15

Session B of Focus on the Students

Session Chair: **Ravi Thambusamy**

The Relationships Between Cultural Values and Cyber-loafing Using the Hofstede Model: Insights from Singapore and the United States
Joseph C. Ugrin, Kansas State University
Shane Nickle, Kansas State University
John Pearson, Southern Illinois University Carbondale

"Facebook Friendly" Competition, Investigating the Impact of Interpersonal Competition on Data Integrity in Online Social Networks
Ravi Thambusamy, University of Arkansas at Little Rock
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Determining the Effects of Tutoring Modality on MIS Student Performance, Course Evaluation, and Attrition Rate
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Casie Prible, Eastern Kentucky University

Using Social Tags and User Rating Patterns for Collaborative Filtering
Iljoo Kim, Saint Joseph's University
Vipul Gupta, Saint Joseph's University

ASSOCIATION OF BUSINESS INFORMATION SYSTEMS

March 10, 2016
(Thursday)

5:30 p.m. – 7:00 p.m. Ballroom C

FBD Presidential Welcome Reception

Everyone is invited to attend this FBD conference-wide social event. Visit with long-time friends and make new ones as you enjoy light appetizers and live music. A Cash Bar is available and a limited number of drink tickets will also be distributed. Stop by to relax and wind down from the day's conference activities before heading out to other association and cultural events, dinner, or historic sites.

Enjoy your evening in Oklahoma City!

March 11, 2016
(Friday)

8:00 a.m. – 9:00 a.m. Ballroom B

ABIS and ABC - SWUS Joint Breakfast

All ABIS and ABC - SWUS members are invited to come and enjoy a great breakfast!

9:00 a.m. - 10:00 a.m. **–Joint Session with ABC** Ballroom B

ABC-SWUS and ABIS Joint Session - Best Paper Presentations

Co-Session Chairs/Association Presidents: **Kathryn O'Neill and Jim Larsgaard**

ABC-SWUS Best Paper:
The Little Creamery that Could: Weathering a Crisis and Maintaining Brand Loyalty
Geraldine E. Hynes, Sam Houston State University
Melissa Barrett, Sam Houston State University

ABIS Best Paper:
Developing Data Analytics Skill in a Business Computer Applications Course
Robert B. Mitchell, University of Arkansas at Little Rock
Ravi Thambusamy, University of Arkansas at Little Rock

10:00 a.m. - 10:30 a.m. Ballroom C

FBD Coffee Break

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ASSOCIATION OF BUSINESS INFORMATION SYSTEMS

March 11, 2016
(Friday)

10:30 a.m. – 12:00 p.m. Meeting Room 15

Session A of Innovation

Session Chair: **Begona Perez-Mira**

Community College Students' Textbook Preferences: Examining Open Source and E-Book Innovation in Higher Learning
Melissa Hunsicker-Walburn, Fort Hays State University
Wally Guyot, Fort Hays State University
Robert Meier, Fort Hays State University
Loretta Beavers, Southwest Virginia Community College

Identifying Job Focus and Course Priorities in IS Curriculum Development Using Online Job Advertisements
Richard Woolridge, University of Arkansas at Little Rock

Social Media Communication Usage Preferences in Higher Education: Differences Based on Mode of Learning Delivery
Sarah Wright, Northwestern State University of Louisiana
Curtis Penrod, Northwestern State University of Louisiana
Begona Perez-Mira, Northwestern State University of Louisiana
Eddie Horton, Northwestern State University of Louisiana
Thomas Hanson, Northwestern State University of Louisiana

Cyber Business Law and Project Based Learning
Carmella Parker, Northwestern State University of Louisiana
Jason W. Powell, Northwestern State University of Louisiana

Search Engines: The "Lynchpins" of the Digital World
Degan Kettles, The University of Central Oklahoma

Noon – 1:30 p.m. **Lunch on your own**

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1:30 p.m. – 3:00 p.m. Meeting Room 15

The Millennial Generation & Peer Learning

Session Chair: Sarah Wright

Baby Boomers and Millennials: Planning the ABIS 2016 Conference
James (Skip) Ward, Fort Hays State University
Maggie Schneider, Fort Hays State University

Course Design for the Millennials—Mobility of Learning
Sarah Wright, Northwestern State University of Louisiana
Begona Perez-Mira, Northwestern State University of Louisiana

March 11, 2016
(Friday)

The Millennial Generation & Peer Learning (continued)

Theory to Practice: Texting in the Workplace
Chynette Nealy, University of Houston Downtown

Does Learner Temperament Predict Career Pathway Choice and Interest in Online Learning?
Scott Jones, Fort Hays State University
Felix Albl, Fort Hays State University

3:00 p.m. - 3:30 p.m. Ballroom C

FBD Coffee Break

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3:30 p.m. - 5:00 p.m. Meeting Room 15

Session B of Innovation

Session Chair**: Degan Kettles**

An Assessment of a Technology-Enriched Bridge Program for Prompting the Diversity of the Digital Forensics Workforce
Joselina Cheng, University of Central Oklahoma
Becks Feng, Becks Intelligence Group

Customer Relationship Management: A Model for Small Business Development Centers
Degan Kettles, University of Central Oklahoma
Christine Alexander, University of Central Oklahoma

Radio Frequency Identification in Health Care: Uses and Limitations
Shaun R. Fant, Cameron University

The Role of Intensity of Alumni Sports Site Usage on Social Capital, Team Identification and Purchase Intentions
Akhilesh Bajaj, The University of Tulsa
Adrien Bouchet, The University of Tulsa

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DEVELOPING DATA ANALYTICS SKILL IN A BUSINESS COMPUTER APPLICATIONS COURSE

Robert B. Mitchell, University of Arkansas at Little Rock
Ravi Thambusamy, University of Arkansas at Little Rock

ABSTRACT

Colleges of Business are today challenged with meeting the demand from employers that graduates have data analytics knowledge and skill. This paper illustrates how one institution has redesigned information systems courses within the business core to assure all business graduates have an identified level of analytics competency. Provided are a sample course syllabus and sources of instructional materials and training resources.

INTRODUCTION

A recent Forbes Insights survey of 316 executives in large global organizations found that 59 percent of the respondents identified big data and analytics among the top five ways to achieve a corporate competitive advantage (Press, 2015). Organizations globally are using analytics to improve decision making, cut costs, and create new products and services (Davenport, 2014). Columbus (2014) indicates that the big data market should increase to $122B in revenue by 2025.

A 2014 TDWI global survey of 328 analytics professionals in varied industries and company sizes found the following types of analytics being performed currently or planned within the next three years by 70 percent or more of the respondents: dashboards, dashboards with KPIs and metrics, visualization, descriptive analysis, self-service BI, data discovery, forecasting, continuous monitoring and alerting, and real time reporting (Halper, 2015). The study identified that advanced analytics tools/techniques such as predictive analysis, modeling, and operational intelligence are being used or will be within the next three years in marketing and/or marketing analysis (78 percent), sales (68 percent), finance (70 percent), operations management (69%), network/computer management (64 percent), and human resource management (52 percent), to name a few. This increasing use of data analytics is impacting job demand for business graduates with analytics expertise. By one estimate, there will be a shortage of 140,000 to 190,000 analytics professionals and 1.5 million analytics managers by the year 2018 (McKinsey, 2011). To address this shortage, several organizations are investing heavily in business analytics skill development. GE, for example, has invested more than $2 billion in a new analytics center in the bay area to develop skilled workers in the analytics area (Davenport, 2013).

Columbus (2014) reported an 89.9 percent increase in demand for computer systems analysts with big data expertise during 2014. Job demand increases for big data expertise in other occupations were also impressive: marketing managers, 84.8 percent; network and computer systems administrators, 76.7 percent; IT project managers, 123.6 percent, and web developers, 42.7 percent (Columbus, 2014).

Woolridge, Thambusamy, and Mitchell (2015) reported the design of a business analytics undergraduate degree which

focuses on preparing graduates throughout the college of business with foundational analytical skills for moving into this arena. The articles emphases the philosophy on which the program is based is that analytics skills be developed in specific IT courses and then applied through varied areas of business.

DESIGN OF AN ANALYTICS-BASED BUSINESS COMPUTER APPLICATIONS COURSE

In their study, Woolridge, Thambusamy, and Mitchell (2015) found "Can Analyze Data" and "Can Retrieve Data" as the two top-rated business analytics technical skill areas (4.59 rating and 4.47 rating respectively on a 5-point scale). In terms of the importance of potential courses in an undergraduate business analytics curriculum, "Data Analysis with Excel" received a 4.35 rating, "Data Visualization with Excel" received a 4.12 rating, with both areas being listed in the top 3. In the business computer applications course (Business Information Systems 3352), students are provided technical skills in Excel for data analysis and visualization to complement their statistics skills. The course description, course objectives, and course schedule for Business Information Systems 3352 Business Data Analysis and Visualization are presented in Table 1.

DATA ANALYSIS COURSE PROJECT

A required component of the course is to complete a business data analysis project which includes a complete analysis with visualization components. This team project allows students the opportunity to identify a problem that can be addressed through data analysis, complete the analysis, interpret findings within the identified context, and effectively communicate the findings/conclusions.

1. Detailed/complete analysis of an identified dataset
    a. Selection of dataset which provides sufficient information for a comparative analysis of identified factors
    b. Identification of specific objectives/questions related to data which the analysis will address/answer
    c. Development of workbook (containing multiple worksheets) which contains organized worksheets that logically develop analysis step by step (including documentation)
    d. Development of analytical short report which provides descriptive analysis, including appropriate visualization components
2. Submission to include
    a. Analysis and visualization workbook (Excel)
    b. Short report (Word)

ANALYTICS INSTRUCTIONAL MATERIALS

Many instructional resources are available which provide demonstrations of analytical tools, including advanced Excel applications. A few of the resources are as follows:

- Analyzing and Visualizing Data with Excel. (Hoter, 2015)
- Data Visualizations with Power BI in Excel 2013. (Neeb, 2014)
- Faster Insights to Data with Power BI Jump Start. (Tejedor and Weyn, 2014)

- From Data to Insight and Impact: The BI Revolution. (Reguera, 2014)
- Big Data Analytics. (Ramos and Sen, 2013)

The Microsoft Virtual academy (http://www.microsoftvirtualacademy.com/) provides numerous training courses and other resources such as the following:

- The Business Intelligence Revolution https://www.microsoftvirtualacademy.com/en-US/training-courses/from-data-to-insight-and-impact-the-bi-revolution-8361
- Power Query and PowerPivot in Excel https://www.microsoftvirtualacademy.com/en-US/training-courses/from-data-to-insight-and-impact-the-bi-revolution-8361

Data Visualization with Power Business Intelligence
https://www.microsoftvirtualacademy.com/en-US/training-courses/from-data-to-insight-and-impact-the-bi-revolution-8361

Many BI tools are integrated into Office 2016.

Contact the authors for sample projects using Office analytics tools.

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Woolridge, R., Thambusamy, R., & Mitchell, R. (2015). Developing high-demand skills through an interdisciplinary business analytics program. Journal of Business Information Systems, 8, 6-37.

Table 1. Business Information Systems 3352 Business Data Analysis and Visualization Syllabus

COURSE DESCRIPTION:

Development of analytical, data visualization and reporting, and collaboration skills necessary for success in a data driven business environment. Focus on cutting-edge technologies in a business context.

COURSE OBJECTIVES:

1. To effectively design spreadsheets for long-term viability.
2. To apply Excel functions and analysis tools to business problem solving and critical thinking scenarios.
3. To use advanced Excel tools for data analytics.
4. To critically analyze appropriateness of data analysis techniques.
5. To use visualization tools for business communication and reporting.
6. To communicate effectively in a virtual environment.

COURSE SCHEDULE:	**Related Objectives**	**Time Allocation**
Data Analysis (Excel):		
Excel customization: options, Quick Access toolbar, ribbon; effective spreadsheet design; introduction to data cleansing using Flash Fill; viewing data options using Quick Analysis; navigating Big Grid; file formats; cloud storage/linking/information sharing	1, 2, 6	1.5 weeks
Functions and complex formulas: financial, logical, lookup, Database; 3-D and array formulas Automating repetitive functions (macros)	2, 3, 4	4 weeks
Table Intelligence: PivotTables and Pivot Charts (including Slicers and Quick Explore), PowerPivot (Mashing), Interactive Dashboards (Power View, GeoFlow)	3, 4	3 weeks
What-If Analysis: Goal Seek, Scenario Manager, Solver	2, 4	1.5 weeks
Visual Presentation/Data Visualization: Flash Fill/Quick Analysis, conditional formatting, data bars, sparklines, charting	3	1 week
Data Visualization (Word):		
Word customization: options, Quick Access toolbar, ribbon, templates/themes/styles; Document design: multiple-page documents/sections, headers/footers, pagination, custom forms Visualization: graphics and related features Research tools: citations, referencing, hyperlinks/cross referencing	5	2 weeks

Collaboration, security, cloud resources: Document Inspector, track changes, document comparing/combining, digital signatures, Sky Drive, resource and document sharing, Print to Blog feature, Microsoft Presentation Service	5, 6	1 week
Integration of Office Applications	1, 2, 5	1 week

RADIO FREQUENCY IDENTIFICATION IN HEALTHCARE: USES AND LIMITATIONS

Shaun R. Fant, Cameron University

INTRODUCTION

The purpose of this paper is to explain radio frequency identification, address implications in healthcare and discuss current limitations. Radio Frequency Identification (RFID) has been a hot topic in technology, particularly in the field of supply chain management. Uses in manufacturing and distribution industries are well documented. However, there is currently minimal literature addressing implications of RFID in healthcare. New technologies are utilizing RFID to track patients and supplies, communicate patient information, as well as using sensors attached to RFID tags to communicate potential health problems.

Explanation of RFID

RFID utilizes radio waves in different frequencies to relay information to and from chips with antennas. A reader is required to read the chip, often referred to as tags. Software is then utilized to interpret the data received by the readers. There are two types of tags. A "passive" tag does not have a battery, but requires a reader to scan it within a close range. An "active" tag contains a battery so that it can emit a signal and can be ready from longer distances (Coustasse, Tomblin, & Slack, 2013). The major benefits of RFID over other scanning and reading technologies include the ability to read more data without line-of-sight scanning.

RFID in Industry

RFID is currently being used in several industries. Many companies in manufacturing and in distribution are utilizing RFID to track inventory. RFID technology makes it possible to track items and supplies while following materials through the manufacturing plant and warehouse. Shipping containers can be tracked utilizing RFID. Contents in the shipping containers can be easily scanned with the proper readers to notify the contents of the containers without even being opened.

Some other industries are beginning to utilize RFID. The wine industry is beginning to utilize RFID in tracking the production of wine. The RFID tags are attached to grape bins as they enter the winery. The tags are able to not only convey the vineyard but also the weather conditions during growth as well as plant and harvest dates. As the wine is produced, different information is added, including room temperature during each phase of the process as well as which barrel the wine was fermented in and the characteristics of the barrel (Wang, Kowk, & W.H, 2012).

Research is ongoing concerning long-range RFID tags on roadways to help traffic signals communicate to vehicles the road conditions of the roadway. The sensors in the vehicles can then adjust speeds to accommodate to the conditions. The utilization of RFID tags on roadways can help promote furthering the automatic driving car (Perez, Seco, Milanes, Jimenez, Diaz, & de Pedro, 2010).

RFID is currently being utilized in sensing and alerting to potential issues with food safety. Research has been conducted to determine if an RFID sensor can sense milk quality. The sensors were placed on the side wall of the milk cartons. Early indications show promise toward sensors indicating milk spoilage. The same study also addressed the quality of fish and sensors to indicate bacterial growth. Results were encouraging (Potyrailo, Nagraj, Tang, Mondello, Surman, & Morris, 2012).

In the service industry, Malaysia has been issuing passports with RFID tags since 1998. Paris accepts transport payments with RFID. Many libraries use RFID rather than barcodes. Mostaghel et al. surveyed companies in the service industry. A 2012 survey found that only 24 of the 233 businesses in the service industry used RFID, with 21 firms planning to begin usage within the next 18 months (Mostaghel, Oghazi, Beheshti, & Hultman, 2012). The survey indicates that the service industry is not currently invested in RFID. The advantage of RFID is the ease of tracking shipments in containers all the way to store shelves.

RFID in Healthcare

Hospitals are continuing to struggle financially due to ever-changing conditions in the environment. Healthcare costs continue to increase while reimbursement continues to decrease. Hospitals are looking for ways to better balance the budget by looking for efficiencies in productivity and reducing waste in supply chain management. RFID presents new solutions for both. Many hospitals currently use barcodes with scanners. However, a primary difficulty with bar codes in addition to required line-of-sight scanning and limited data is that the barcodes themselves are not very durable. They easily rub off when from a patient armband when washing hands or even just moving against the sheets.
A 2006 article from Wicks, Visich, and Li, discussed the explosion of RFID usage among industries, including the healthcare industry. They cited employee productivity as a benefit due to not having to spend time searching for equipment. The CEO from Agility Healthcare Solutions stated, "A 220-bed hospital can save $600,000 annually from less shrinkage, fewer rentals, deferral of new purchases and improved staff productivity (Wicks, Visich, & Li, 2006)." They also noted that RFID technology can improve patient and employee safety by controlling access to parts of the building. Comanche County Memorial Hospital utilizes RFID badge readers that allow access to only certain employees to the pharmacy.

RFID can and is being utilized in some hospitals for the same type of supply chain management functions as in other industries. Healthcare utilizes many types of both expensive and inexpensive equipment. "In a 2004 study, lost and stolen equipment cost about $4,000 per bed (Coustasse, Tomblin, & Slack, 2013)."

Patient privacy has been a concern with the use of RFID, believing that someone with a reader could scan information about the patient. However, patient privacy is actually increased. "Unless a traceable asset could somehow be associated with a patient and/or the patient's data in violation of HIPAA or other legal and regulatory requirements, RFID asset tracking poses little, if any threat to patient privacy because assets, not patients are traced (Coustasse, Tomblin, & Slack, 2013).

INTEGRIS Health System conducted a pilot study utilizing RFID to track hernia mesh

patches utilized for repairing hernias. Because numerous sizes are required in the operating room and not all patches were being replaced, INTEGRIS wanted to see if RFID tracking could help them better utilize the patches and decrease the cost of the supplies. INTEGRIS addressed the return on investment. They found a savings of $111,500 in lost and missing patches, return on investment (ROI) linked to expired products around $223,000, and an extrapolated ROI from lost revenue around $614,600 (Abijith & Fosso Wamba, 2012). In the same article, they discussed how Intermountain Healthcare in Utah is utilizing RFID to improve process time in laboratory sampling. They were able to reduce time and cut the cost per test as well as increasing knowledge of location of samples.

Some hospitals are utilizing RFID for medication and blood distribution. The tags are located on the individual packets for each pill. Sensors could even potentially register when the blister packet is opened. Many hospitals are currently using barcodes with scanners for medication distribution. The RFID tags can hold much more information than barcodes. Utilizing the RFID, nurses and other healthcare workers can quickly identify patients in order to minimize medical errors (Ajami & Rajabzadeh, 2013).

Some emerging technologies related to healthcare include tracking sponges utilized during surgery. Sponges that are left behind in a person present large health risks to patients. A study was performed with sponges that were tagged with a passive RFID chip (Wiederkehr, Gama, Wiederkehr, Stelmasuk, Carvalho, & Wiederkehr, 2014). Once the sponges were completely inserted, the researchers scanned the abdomen with a reader. The study found one hundred percent accuracy in identifying the location of all sponges that were placed inside the abdominal cavity of a pig. As a control, sponges without tags were placed in the cavity of the pigs that did not interfere with the signal from the tagged sponges. This utilization for RFID can significantly decrease the time and potential human error of miscounting items.

Another emerging technology related to RFID is sensors that not only provide information on location, but that communicate body systems. Termed biosensing, RFID tags can sense bodily functions and communicate to users. For instance, for someone with diabetes, blood sugar levels that are out of range can be life threatening if not addressed quickly. A current tag that is being created will track a person's blood glucose levels. When the levels are out of range, the active tags sense the level and communicate to the user by utilizing an app on a smart phone. The user can then do whatever is needed to adjust the glucose levels whether that is an insulin injection or just eating a snack (Moore, 2009).

Addressing employee safety, a study was conducted by Lucet, et al, tracking healthcare worker time in rooms of patients with tuberculosis or those who possibly had tuberculosis. The study tracked healthcare worker entry into the patient room and duration. Healthcare workers were asked perception of the amount of time in the rooms with possible exposure along with how frequently those in each discipline entered. By tracking with RFID, healthcare workers can be given better data to track potential exposure and learn how to minimize risk exposure (Lucet, et al., 2012).

Barriers to RFID use in hospitals

While there are many positive uses for RFID, there are also many barriers to implementation. As studies in other industries have found, the current RFID technology still has difficulty with specificity in location due to a longer range of sensors. Therefore, the positive reason for utilizing RFID is also a negative due to the increased range of frequencies. When a tag passes a reader, the reader can pick up the signal whether intentional or not. This creates "clutter" in the signal (Garcia-Betances & Huerta, 2012).

Staff attitudes regarding the use of technology for tracking purposes can limit the implementation and usage of RFID. In a survey by Okoniewska et al, they surveyed reliability in tracking and threshold monitoring. "The study showed a 100% accuracy in detecting threshold enter and exit events (Okoniewska, et al., 2012) ." A survey completed by nurses indicated negative views on the system's accuracy. The study did find, however, that location proximity within two meters is not feasible with current technologies.

However, one of the biggest barriers to implementation is the cost to implement. The tags alone are very expensive when one begins to look at all the items that would need to be tagged. In the study about the sponges with RFID tags, all of the sponges would need to be tagged. Hospitals have an incredible number of items that enter the building every day and all that are to be tracked need to be tagged. The study by Wicks, et al, stated, "For a 1000-bed hospital, that could mean tagging 20,000 items per day" (Wicks, Visich, & Li, 2006). While RFID can save money, it must be extremely accurate to be able to cut the cost needed to implement the system. When hospitals are considering RFID, they are also weighing other projects that have recently been completed with the required implementation of electronic medical records and coming in 2015, the implementation of International Classification of Diseases, volume ten (ICD-10) (Coustasse, Tomblin, & Slack, 2013).

A study was conducted by Pantchenko et al, addressing potential interference of RFID with neurostimulators. A neurostimulator is a device that provides stimulation into the brain or other organs to treat epilepsy, depression, incontinence, Parkinsonian tremor, and pain relief. The study addressed RFID emitters with several different frequencies. The test found that one of the neurostimulators was inhibited by RFID emitters in the 134 kHz range. Due to potential conflicts, the study failed to identify the neurostimulator that was unable to function around the 134kHz emitter. When the neurostimulator was inhibited by the emitter, it was unable to perform its function. It is important for someone with the particular neurostimulator to know that RFID emitters can potentially interfere with the function of the device (Pantchenko, Seidman, Guag, Witters, & Sponberg, 2011).

DISCUSSION

RFID certainly has its place in healthcare. Exactly to what extent and for what applications is still uncertain. While supply chain management is the easiest to identify and can be absolutely vital to reducing supply costs, the emerging biosensors can hold potential. The ability for sensors on the skin (or even some implanted under the skin) can hold potential for saving lives. As was discussed earlier with the blood glucose sensor, other sensors could be created to

anticipate a seizure, a heart attack, or even an infection.

Patient tracking can have large implications for patient safety. Some patients who are considered to be flight risks can be tagged with an armband and more easily located within the building. Those considered flight risks often have cognitive deficits whether due to dementia or brain injury. They have poor memory and forget they are in the hospital and do not remember what happened to them. These patients can often be ambulatory with the cognitive deficits which can create increased difficulty with keeping them in their rooms or on the floor. Currently, hospitals are using alarms, but they only work within the confines of the readers. The RFID sensors can be located strategically around the hospital to find the patients. If active tags are utilized, it can be even easier.

Patients are not the only people who can be tracked. Employees can also be tracked. A common complaint from hospital patients is that it takes too long for someone to answer a call light and address patient needs. An RFID system at INTEGRIS Health System analyzes time from when a patient calls for assistance until the time a staff member enters the room. The system also notifies anyone in the hallway via different colored lights what type of healthcare worker is in the room, such as an RN or a nursing assistant. The RFID chips are located in the employee identification badges. The purpose of utilizing employee tracking in this case is not to actually track the employees, but to have data regarding the patient experience. The other benefit of tracking employees, however, is to trace paths. By doing so, a spaghetti diagram can be created to trace the paths of employees and identify inefficiencies. Once those inefficiencies are identified, solutions can be presented to help minimize wasted time. For instance, if a coffee pot is on the end of a hallway and staff members are constantly going back and forth from the coffee pot to get coffee for patients, it would stand to reason that either the coffee pot should be moved to a centralized location or a different system of coffee distribution could be suggested.

Some may argue that tracking employee movement is invading privacy. Whenever there is a new technology, one could make the argument about invasion of privacy. However, that has not stopped employers from utilizing video cameras or from monitoring internet usage. While some employers could take the monitoring too far, most just want to increase productivity of employees. The RFID tracking of employees is not to monitor individual activity, but to look for trends in movement. Employees must realize that if the employer is paying for the service of the employee, they have the right to know where the employee is located and what they are doing. RFID is simply a tool in better managing employee efficiencies.

Hospitals encounter large difficulties with supply chain management. They have storage rooms in virtually all areas of the building. Because there are so many rooms, it is often difficult to keep track of supplies and equipment. Surgical supplies and prostheses are commonly stocked in rooms near the operating rooms. Wheelchairs are located in all areas of the hospital and are often taken by patients and families. Staff is traditionally infamous for stock-piling supplies in hidden areas so they have the supplies when they need them. However, with so many rooms and so many supplies, many of the supplies expire before being used, causing increased expenses to the hospitals. A good RFID system would make

tracking supplies much easier. Labor costs could also decrease by utilizing readers to track stock of supplies. Even if passive tags are utilized, a reader could be utilized to quickly scan the inventory in a supply room, making counting and stocking much simpler.

For larger, more expensive items, active tags can be utilized to track real-time positioning of the equipment. Active tags could be placed on wheelchairs, IV infusers, laptops, scanners, etc. Users could then utilize tracking software to locate supplies within the hospital. Wheelchairs are a common item that must be replaced due to loss and staff members hiding them. Comanche County Memorial Hospital is currently working with students from Cameron University on a project to track laptops in the system. Through the use of tracking technologies, laptops will be able to be tracked and located.

The Joint Commission, a surveying organization for hospitals, has identified several national patient safety goals. These goals have been focused on because of past events causing concern for patient safety. A few examples of the goals are: consistent hand washing, identifying each patient with two identifiers, eliminate transfusion errors, improve the effectiveness of communication among caregivers, and improve the safety of using medications (Hospital National Patient Safety Goals, 2015). Most of these goals can be addressed with the use of RFID. A biosensor could be utilized to indicate an employee washing his hands when he enters a room. A scanner for healthcare workers can cross reference the employee identification badge RFID tag with the RFID tag of a patient to identify the patients. RFID tags can be placed on blood products to easily identify temperature, time and date blood was drawn as well as antigens and blood type. Medication identification can be utilized by RFID tags on medications scanned by the nurse prior to passing to patients. Overall, RFID can have an enormous impact on patient safety.

There are still barriers to address with using RFID in the hospital setting, the largest of which is probably cost. Most hospital organizations have difficulty with the capital investment with an unsure ROI. There are several indicators that RFID can decrease the cost of doing business with increased staff efficiency, patient safety, and minimizing supply costs. However, the initial price tag is large. Processes will also need to be adjusted on applying the RFID tags to products. Hospitals and vendors will both need to work to ensure consistent placement of tags.

Staff attitudes toward RFID will also need to be addressed. Certain front-line healthcare professionals are traditionally skeptical of new technologies in the workplace. They will need to have advanced training to become comfortable with the technology in order to rely on it.

CONCLUSION

Radio frequency identification has terrific potential in industry, particularly in the healthcare industry. There are several applications for RFID, including patient and employee tracking, supply chain management, and biosensors. As RFID becomes more readily available and more businesses in healthcare and other industries utilize the technology more, the cost should decrease. Future generations of RFID will likely eliminate the current discrepancies in reading location. Hospitals can often be on the cutting edge of technology when it comes to saving lives. RFID can help them stay in business so they can continue to do just that.

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AN ASSESSMENT OF A TECHNOLOGY-ENRICHED BRIDGE PROGRAM FOR PROMOTING THE DIVERSITY OF THE DIGITAL FORENSICS WORKFORCE

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ABSTRACT

This study examined the effects of a summer bridge program on underrepresented high school students. A summer bridge program, which was funded by the Oklahoma States Regents of Higher Education (OSRHE) over a three-year period, aimed to promote career awareness of and interest in digital forensics. Participants were administered a pre-survey at the beginning of the bridge program to establish a baseline. Participants were then administered a post-survey at the completion of the bridge program. Differences were compared to form the basis for research questions which the study sought to answer.

Keywords: Career Development, Innovation, Job Shadowing, Model, Simulation

INTRODUCTION

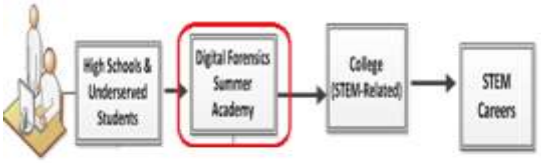
An Emerging & Interdisciplinary STEM Career

As modern-day cybercrimes such as cyber security breaches, terrorism, white-collar crimes, hacking, and identify theft continue to rise, the need for the digital forensics professionals is becoming a national priority (Choo, 2008; U.S. Department of Defense, n.d.). Digital forensics enables law-enforcement professionals to solve cybercrimes with **s**cientific methods, **t**echnological tools, **e**ngineering skills, and **m**athematical equations (**STEM**). According to the Department of Labor (2015), digital forensics is now ranked as one of the top five professions with an annual growth rate of 34% in the nation. A rising demand for digital forensics professionals in Oklahoma shows a growth rate of 39% over the next five years (Oklahoma Employment Security Commission, 2015).

Statements of Problem & Need for a Summer Bridge Program to Promote STEM Participation

Unfortunately, there is a shortage of equitable digital forensics (DF) workforce in Oklahoma in spite of the exponential growth rate with job openings for 190 forensic professionals in the next five years (US Department of Labor, n.d.). One contributing factor is the low STEM participation in Oklahoma in comparison with national averages (Oklahoma State Regents of Higher Education, n.d.). Next, *Cyber Security*, which is part of K-12 curricula, is currently offered as a half-unit, elective course in only a few of Oklahoma high schools. Due to resource and fiscal constraints, this course is often taught with lectures in a traditional face-to-face classroom environment instead of a hands-on approach in a modern-day forensic lab, thus limiting the effectiveness of instruction. These constraints discourage Oklahoma youth from exploring college resources and the immense career opportunities of the DF profession available (National Research Council, 2012; Rising above the Gathering Storm, 2008).

Figure 1. A Collaborative Framework for STEM/DF Career Exploration & Education Pathway



PRIMARY GOAL & OBJECTIVES

To address the shortage of the DF workforce shortage, Oklahoma States Regents of Higher Education (OSRHE) funded a summer bridge program over the 2013-1015 periods. The bridge program aimed to broaden STEM participation and matriculation to and graduation from, college expected outcomes for targeted participants. Program objectives (Table 1) were to be supported by the design, development, and implementation of a CSI Academy. The project team collaborated with the Oklahoma State Bureau of Investigation (OSBI), FBI, and Edmond Police to develop innovative teaching and learning tools, job-shadowing activities, and simulated learning environments that are unavailable in traditional high school classroom settings.

Table 1. The **CSI Academy Objectives & Supporting Activities**

Measureable Objectives
1. Broaden STEM/DF participation by underrepresented Oklahoma students.
2. Promote early awareness of STEM/DF career opportunities & interests.
3. Promote college aspiration with awareness of college planning for the STEM/DF path.
4. Build confidence by linking the CSI Academy with Post-CSI opportunities.

DESIGN PRINCIPLES & THE THEORETICAL FRAMEWORKS

To better prepare today's students for their STEM participation in highly competitive global societies, the bridge program will be grounded with principles and theoretical frameworks in professional literatures relating to STEM careers, technical education, and technological literacy (National Research Council, 2012; Fostering 21st century skills, n.d.; Rising Above the Gathering Storm, 2008). The focus of those literatures is to promote 21st century competencies and transferrable skills that are critical for the youth in our nation to succeed in any STEM-related fields or educational pathways. The following principles and frameworks will be incorporated into the design and the implementation of the CSI Summer Academy in order to support the CSI bridge program objectives.

I. A Collaborative Job-Shadowing & Mentoring Framework for Promoting STEM Participation

To seek relevant work experience for high school students, the CSI bridge program partnered with law-enforcement entities at the city (Edmond Police), state (Oklahoma Fusion Center & Bureau of Investigation), and federal (FBI) levels. The CSI Academy participants were provided with job-shadowing opportunities via guided tours to visit OSBI and Oklahoma Fusion Center. Crime-fighting professionals, who volunteered to serve as mentors, shared how information about terrorism and crime prevention is collected, assessed, analyzed, and disseminated. Having the opportunity to tour facilities typically reserved for elite law enforcement units allows students to explore surroundings that they would otherwise not have access to. Exposure to the CSI Academy can aid younger students in developing an

educational path, visualizing whether forensic science is for them, and clarifying career goals.

II. A Simulated Learner-Centered Framework for Encouraging the STEM-CF Education Pathway

Our nation is at crossroads facing a new digital divide because today's learners live in an online experiential environment where as today's schools do not (Living & Learning with New Media, 2008; Project Tomorrow, 2009). Today's millennial generation, who grew up with digital games and apps, the Internet, and social media, prefers learning through more interactive methods that are available to them anytime and anywhere (Reeves & Minocha, 2011; Springer International Handbook of IT, 2011). Although many high schools have access to modern technologies, teachers prefer using text-based lectures to deliver content.

To supplement text-based lectures which often occur in traditional high school classrooms, the CSI Academy was designed with technology-enriched interventions such as information communication and simulation technologies. The CSI participants were immersed in simulated environments using avatars to role play as forensics professionals and solve modern-day crimes (Figure 2, 3, & 4).

Figure 2. Virtual Police Office

Figure 3. A Virtual Forensics Lab

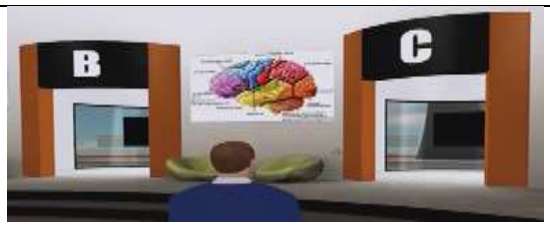


Figure 4: A Virtual Interview Room

While emerging technologies may not address all educational challenges and will not replace all traditional teaching methods, research shows that simulated learning environments can support interactive learning, motivate students to achieve higher educational outcomes, and transform educational practices (Dalgarno, et al, 2010; Fostering learning in the networked world, n.d.). Further, simulation technologies can provide educators with a cost-effective venue for exploring, creating, and reusing permanent learning objects when they are too expensive or impossible to achieve in traditional classroom settings (Brown, 2010; Crellin & Karatzpimo, 2010; Dalgarno et al, 2010).

METHODOLOGY FOR DATA COLLECTION & ANALYSES

Proposed Research Design

The proposed research design was triangulation with a mixed method to analyze qualitative and quantitative data. The timeline was longitude by collecting mixed data over a three-year period. An IRB was pre-approved prior to any data collection.

Target & Sample Population

The general population included high students who attended 256 high schools across the state of Oklahoma. To actively recruit underserved population, the project team targeted high school students who attended the annual STEM conference for Women & Minorities. The sample population consisted of a total of 105 applicants who were chosen by the project team to attend the bridge program. Participants who volunteered to participate in the research study signed a consent form prior to the start of the bridge program.

Research Questions

1. How does a DF bridge program affect student STEM career awareness in relation to ethnicity?

2. How does a DF bridge program affect student STEM career interest in relation to ethnicity?

3. How does a DF bridge program affect student aspiration for STEM education in relation to ethnicity?

Instruments

Both the quantitative and the qualitative data were derived from the CSI Survey as shown in Appendix A. Quantitative data were from closed-ended questions which participants could choose from seven-point Likert Scales (Strongly Agree….Strongly disagree). Qualitative data were derived from the open-ended questions and comment sections.

Data Collection & Data Analysis

Participants were provided with an URL link to complete a pre-survey before the bridge program. The pre-survey resided on a Qualtrics server. After attending the bridge program, participants were administered with a post-survey. Both the pre- and the post-survey were then downloaded into the primary investigator's computer. Table 2 summarizes research dependent variables (DV) and the analytical methods for performing the mixed data analysis.

Table 2. Analytical Method

RQ #	Instrument	Dependent Variable	Analytical Method
RQ 1	CSI Survey	STEM Career Awareness	Descriptive statistics; Thematic Coding
RQ 2	CSI Survey	STEM Career Interests	Descriptive statistics; Thematic Coding
RQ 3	CSI Survey	STEM Education	Descriptive statistics; Thematic Coding

DISCUSSION

To answer the first research question (RQ), Table 3 presented the effects of the bridge program on subgroups of underrepresented population. The difference between the pre-survey and post-survey were compared to form the basis for answering the first RQ. Judging from the positive differences, the DF bridge program was effective in helping students with the all ethnic backgrounds to become more aware of STEM careers.

Table 3. Effects of the Bridge Program on Career Awareness

Ethnicity	Career Awareness		
	Pre-Survey	Post-Survey	Difference
1. Black/ African American	5.33	6.50	1.17

2. Native American Indian	5.25	6.25	1.00
3. Caucasian	5.80	6.29	0.49
4. Hispanic	6.30	6.33	0.03
5. Asian	5.59	6.34	0.75
6. Multiracial	5.75	5.86	0.11

To answer the second research question, Table 4 presented the effects of the bridge program on subgroups of underrepresented population. The difference between the pre-survey and post-survey were compared to form the basis for answering the research question. The DF bridge program was effective in helping students with the majority of diverse background to become more interested in STEM with the exception of the Hispanic and multiracial groups of students.

Table 4. Effects of the Bridge Program on Career Interest

Ethnicity	Career Interest		
	Pre-Survey	Post-Survey	Difference
1.Black/ African American	5.89	6.50	0.61
2. Native American Indian	6.11	6.23	0.12
3. Caucasian	6.05	6.32	0.27
4. Hispanic	6.26	6.21	-0.05
5. Asian	5.96	6.40	0.44
6. Multiracial	6.11	5.86	-0.25

To answer the third research question, Table 5 presented the effects of the bridge program on subgroups of underrepresented population. The difference between the pre-survey and post-survey were compared to form the basis for answering the research question. The data suggests that the Digital Forensics Bridge program is most effective with the African American students to pursue the STEM education and attend college. In contrast, the Digital Forensics Bridge program is least effective with the multiracial students in terms of STEM education.

Table 3. Effects of the Bridge Program on College Aspiration

Ethnicity	College Aspiration		
	Pre-Survey	Post-Survey	Difference
1. Black/ African American	4.78	6.39	1.61
2. Native American Indian	6.00	6.17	0.17
3. Caucasian	5.31	6.05	0.74
4. Hispanic	5.78	6.28	0.50
5. Asian	5.07	6.21	1.14
6. Multiracial	6.33	5.21	-1.12

LEADERSHIP IMPLICATIONS, INTELLECTUAL MERITS, & BROADER IMPACTS

Findings from the bridge program provided the institutional administrators, policy makers, grant seekers, and the research community with insights on how to broaden the STEM participation by targeting and encouraging the underrepresented high school students. The bridge program also provided avenues for researchers to explore innovative teaching strategies, simulate authentic learning environments, create effective cyber-enabled learning resources, and improve technological infrastructure in order to better recruit today's students into the highly skilled and rewarding digital forensics profession.

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Appendix A

An Excerpt of the CSI Academy Survey

Please indicate the extent to which you agree or disagree with the following items.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I am aware of career opportunities in science, technology, engineering, and mathematics (STEM).	○	○	○	○	○	○	○
I enjoy learning STEM.	○	○	○	○	○	○	○
I am interested in pursuing a career in STEM.	○	○	○	○	○	○	○
I am aware of career opportunities specific to forensic science.	○	○	○	○	○	○	○
I am confident that I will be able to succeed in a STEM field.	○	○	○	○	○	○	○
I am interested in pursuing a career in forensic science.	○	○	○	○	○	○	○
I understand what professionals in forensic science do.	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I enjoyed working on a STEM project as part of a team.	○	○	○	○	○	○	○
I gained a better understanding of how forensic science works.	○	○	○	○	○	○	○
I learned more about how STEM are conducted.	○	○	○	○	○	○	○
The field trips were beneficial to my learning.	○	○	○	○	○	○	○
The process of solving a real problem/crime was interesting.	○	○	○	○	○	○	○
I better understand the process of planning for college.	○	○	○	○	○	○	○
I better understand scholarship and grant opportunities available for college.	○	○	○	○	○	○	○

SEARCH ENGINES: THE "LYNCHPINS" OF THE DIGITAL WORLD

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ABSTRACT

In just two decades, consumers and businesses have gone from not having web search engines at all to being highly reliant on them for many daily tasks. Understanding how and why web search engines provide value from a theoretical perspective is critical for the technology makers that need to provide leading search products, as well as to organizations that seek to make the best use of them. This article examines two different technology perspectives from IS literature, digital convergence and digital intermediation, and uses them to provide a theoretical basis for how web search engines provide value to their users. This article also explains how these theories suggest the future evolution of the search industry.

Keywords: Digital convergence, intermediation, Internet, search

Lynchpin: "*Something that holds the various elements of a complicated structure together*"

– A definition from Dictionary.com

INTRODUCTION

In the last two decades web search technologies have gone from a non-existent software category to a mainstay of daily computer use. Google, the leading web search engine, is estimated to handle over a trillion searches a year and over 1 billion unique searchers a month (Sullivan, 2013, 2015). The economics of search engines are also impressive, with Google bringing in US$66 billion dollars in ad revenue in 2014 (Google Finance, 2015). In enterprise search, which provides search software tailored to corporate websites, the software provider Autonomy brought in over US$343 million in 2007 (Autonomy 2008).

Like in many other industries, search-related businesses experience significant competition and the landscape is constantly in motion. The quick rise of search engines and the competitive environment that surrounds them raise several questions. First, why did web search become so popular so fast? Second, why is search such a profitable industry? Third, what can firms do to be successful when competing in the search industry? The position taken in this article is that understanding the value that search engines provide to end users provides answers to these important questions. This article therefore examines how web search technologies provide value from two theoretically-based perspectives. One perspective is that of digital convergence, and the other is digital intermediation. In addition to clarifying how search engines currently create value for end users, these perspectives suggest future changes that are likely to occur within the web search engine industry.

DIGITAL CONVERGENCE SETS THE STAGE FOR NEEDING SEARCH

Digital convergence is an idea first expressed by Nicholas Negroponte in 1978 when he proposed that three leading types of communication – computing, printed publications, and broadcasting – would soon converge with each other (Mueller 1999). Yoffie (1997) further explained digital convergence as many types of products that were previously distinct employing

computer-mediated digital technologies to become connected. In other words, the computer was predicted to be a "lynchpin" that would hold together many previously unconnected products. This relationship, modernized, is demonstrated in Figure 1. Today we can look to products like the iPhone which supports a basket of services including calls, email, photos, and music, and see that Negroponte's vision has been realized.

The First Consequence of Digital Convergence, Too Much Information

As digital convergence has become a reality, one consequence is that large quantities of previously-produced media, such as books, music, and video, have become available to anyone with a computer and an Internet connection. In addition, computing devices have made it easy for millions of people to regularly create new digital content. One striking example of the increased quantity and pace of media creation is the fact that YouTube receives over 300 hours' worth of video every minute (Dormehl, 2015).

The explosion of digital content has created challenges for anyone that would like to search for content in its massive cloud. Anderson and Anderson (2002, p. 57) have stated that "electronic networks offer too much information, aggravating search problems." Search technologies, therefore, are key to helping people find the things they want. Terri Wells, an industry expert from Developer Shed (www.developershed.com) and author of over 250 articles whom I personally interviewed, had the following to say related to search:

> *The web is a wonderful gigantic library, and all the books are on the floor. Search engines are your card catalogs and librarians. If you want to find anything, you have to go to a search engine first. The minute someone gets online, the first site they go to is a search engine, there is no other way.*

As the volume of data grows at an increasing rate, search will become an increasingly critical mediator in the digital world.

The Second Consequence of Digital Convergence, Vertical Disintegration

In the early 1980s, some scholars predicated that digital convergence would lead to the emergence of a single monopoly company that would dominate all forms of media (Wicklein 1979, de Sola Pool 1983). A single network television provider that controlled everything from content production through the devices of content delivery would fit this vision. As many companies are now discovering, instead of a consolidation into a single vertically integrated company, digital convergence has forced firms that were once vertically integrated to a great degree to compete in a highly specialized horizontal market structure that is increasingly diversified. Digitization of media has made it possible for each phase of the value chain of communications including production through distribution to be handled outside of a single company, opening the door to vertical disintegration.

The disintegration of the vertical integration of media companies has led to a segmented value chain with five key parts as shown in Table 1. These segments represent opportunities for specialized products and services within the value chain and each segment is continually characterized by increasing specialization and diversity of offerings (Mueller 1999). As a result of

digital standards such as wmv and mp3 formats that allow for easy creation, manipulation, and transport of media, media companies are discovering that it is necessary to be highly specialized within a given segment to survive.

Table 1. Horizontal Segments of a Converged Media Environment

SEGMENT NAME	EXAMPLES OF PRODUCTS AND SERVICES WITHIN SEGMENT
Content	Information products (text, TV, radio, film, financial information, money, graphic art, Web pages, games, music, photography)
Packaging	Services; bundling and selection of content; addition of integrative and presentational functionality
Transmission	Physical infrastructures for transport (fixed telephone network, terrestrial and satellite wireless, cable TV systems, private LANs and WANs, etc.)
Software/ Manipulation	Intelligence, including processing and storage hardware and software for network and individual terminals
Terminals	Local devices for input and output of signals and information (phone handsets, TVs, PCs, organizers, PDAs, etc.)
Sources: Collins et al. (1997) and Mueller (1999)	

An important segment in the value chain that relates to search engine technologies is the manipulation segment, which Mueller (1999) called the software segment. Among the various types of software that can be implemented in this segment is *middleware*, which facilitates network use or make it more accessible. Intelligent agents that can search a network is one specific example of middleware that Collins et al. (1997) identified. Web search technologies act as both middleware and as an intelligent agent in the digital media environment. The prediction that converged media leads to vertical disintegration appears to be highly accurate, because people looking for particular media content today are in general more likely to go to a search engine than they are to a vertically integrated media source to find it.

SEARCH AND DIGITAL INTERMEDIATION

One of the most important roles that search technologies fill is as a digital intermediary. The following section will describe the economic values provided by digital intermediaries and show that search technologies fit this category. In addition, the impacts of disintermediation—the removal of existing intermediaries—as a result of search technologies will be explored.

Search Adds Value as a Digital Intermediary Service

Merriam-Webster's Dictionary (2008) defines the term *intermediation* as something that comes between, and it is often performed by an *intermediary*, which is defined as a mediator or go-between. Many types of intermediaries are observable in real world contexts. A *financial intermediary*, for example, is one of the most commonly-referenced types of intermediaries and performs intermediation between two or more parties in a financial context. Financial intermediaries include loan brokers and brokerage firms.

From an economic perspective, intermediaries exist because they add value in economic exchanges, as opposed to conventional wisdom which may ascribe their existence to opportunism at the expense of other parties. Table 2 provides numerous examples of valuable services that intermediaries offer that have been identified by researchers.

Table 2. Kinds of Value Provided by Intermediaries According to Thought Leaders

Anderson and Anderson (2002)	Baily and Bakos (1997)	Spulber (1999)
• Provide info about buyers • *Provide info about sellers* • *Provide info about products* • Leverage economies of scope • Forge economies of scale • Create time-place utility • Guarantee quality • *Preserve anonymity* • Tailor goods and services	• *Aggregate* buyer demand, seller products for economies of scale/scope and reduce bargaining asymmetry • Protect buyers, sellers from opportunistic behavior of other participants in market by becoming an agent of *trust* • *Facilitate* market by reducing operating costs • *Match* buyers and sellers	• *Reduce transaction costs* • Pool, diversify risk • *Lower costs to match, search* • Alleviate adverse selection • Mitigate moral hazard and opportunism • Support commitment through delegation
Note: Italicized entries relate to services a search engine can provide		

Each of these lists contains services that are identifiable in search engines (these are italicized for emphasis). For example, Anderson and Anderson (2002) note that an intermediary may *provide information* about *sellers* or *products*. Without search engines, consumers searching for products would in many cases have to communicate through interpersonal means that could be less efficient in acquiring knowledge and that would compromise anonymity.

Search Technologies Create a Basis for Disintermediation

In addition to functioning as digital intermediaries that add value, search technologies also function as agents of disintermediation that displace the intermediaries that preceded them. As early as 1995, researchers discussed the Internet as a possible tool of *disintermediation* (Wigand and Benjamin 1995; Gellman, 1996). The idea behind *disintermediation* is that middle men such as libraries (in the case of information retrieval) can be removed because of the resources that are made available by the Internet.

In what cases will search replace traditional intermediaries such as wholesalers and retailers? According to Spulber (1999), intermediaries exist when they can add economic value. In a competitive market where businesses seek to minimize transaction costs, wherever search can provide a less expensive means of providing a service than an alternative intermediary provides, then it will replace that intermediary. In the case of travel agents, for example, search makes it possible to either go directly to the seller of the travel package or to go through a large, online travel agency that enjoys economies of scale and that can offer lower prices than a local provider can.

Although search has the inherent capacity to replace other intermediaries, it will not always do so. Consider the case of a real estate agent. Despite the many inexpensive online listing services that have come online in the last decade, the real estate agent has not been removed. Among a variety of services they provide are drawing up contracts, resolving disputes, reducing information asymmetries, coordinating legally-required activities, and creating trust. Has the real estate agent eliminated online search as a competitor? No, in fact digital search has become an integral tool both for buyers and sellers in the market for residential real estate in the U.S. Some have described this type of economic activity as a lengthening of the value chain, whereby more intermediaries become part of a new market-based system (Granados et al. 2008). In this case, reduced costs related to searching and matching buyers and sellers allow more intermediaries to exist in the value chain. In summary, with respect to intermediation, a search engine can act as a stand alone intermediary, can displace other intermediaries, and can cause the value chain of intermediaries to lengthen.

CURRENT TRENDS IN INTERNET USAGE RELATED TO SEARCH

Real-world measures highlight increased usage trends on the Internet as it relates to search technologies. Table 3 shows that the search provider Google has increased the proportion of websites it has in the top 20 most visited sites (Netcraft 2015). Simultaneously, several news sites that were highly ranked in 2007 are no longer in the top 20. Table 4 shows that more of the top 10 sites in terms of time spent online are now search engines (Yahoo, Google, Bing, Ask). In the US, the average Internet user currently spends 23 minutes per day on search (see Table 5).

Table 3. The Most Frequently-Visited URLs on the Internet

Ranking of Most Visited Sites on the Web 2007	Ranking of Most Visited Sites on the Web 2015
1. www.google.com (http://) 2. www.google.com (https://) 3. www.yahoo.com 4. www.google.de 5. mail.google.com 6. www.google.co.uk 7. www.google.fr 8. mail.google.com (https://) 9. www.foxnews.com 10. www.google.it 11. www.bbc.co.uk 12. news.bbc.co.uk 13. www.microsoft.com 14. www.google.ca 15. images.google.com 16. search.ebay.com 17. www.google.es 18. www.cnn.com 19. cgi.ebay.com 20. www.google.pl	1. www.google.com (https) 2. www.facebook.com (https) 3. clients5.google.com (https) 4. www.youtube.com (https) 5. plus.google.com (https) 6. accounts.google.com (https) 7. mail.google.com (https) 8. s-static.ak.facebook.com (https) 9. static.ak.facebook.com 10. www.google.com 11. apis.google.com 12. client6.google.com (https) 13. google.fr (https) 14. docs.google.com (https) 15. clients4.google.com (https) 16. www.youtube.com 17. www.google.de (https) 18. googleads.g.doubleclick.net (https) 19. google.co.uk (https) 20. tpc.googlesyndication.com
Source: Netcraft 2015	

Table 4. Where People Spent Their Time Online

2006	2011
1. MySpace	1. Facebook
2. Yahoo!	2. AOL
3. MSN	3. Yahoo
4. eBay	4. Google
5. Google	5. Bing/Msn
6. AOL	6. Youtube
7. Pogo	7. Apple
8. Facebook	8. Microsoft
9.Amazon	9. Wikipedia
10. Craigslist	10. Ask
Note: These data are adapted from Meattle in 2008 and 2008 and Go-gulf.com 2012	

Table 5. Activity types Online in US 2013

Activity Category	Minutes Per Day
1. Social networks	37
2. Email	29
3. Online video	23
4. Search	23
5. Online games	19
6. Blogs	8
7. Online radio	8
8. Online newspaper	5
9. Online magazines	3
10. Other	31
Source: Fitzgerald 2014	

THE FUTURE OF SEARCH

Is a single monolithic company rising that is becoming the digital intermediary for all forms of media? The Google usage trends seem to indicate so, even though this notion disagrees with the predictions of digital convergence related to horizontal segmentation. I conducted two interviews with industry and academic professionals to discuss these issues. One interview was with Bradley King, Marketing Director for Yahoo! Travel Services. He believes that the revenue commanded by the top search engines will cause competitors to multiply. His view predicts a highly competitive horizontal market for search. Another thought leader, Arizona State University Professor of Computer Science and Informatics, Hasan Duvulcu, believes that vertical search engines will flourish. He predicts that highly specialized search applications will become increasingly prevalent and they will be found through other major search engines.

CONCLUSION

Search engine growth and impact has been surprisingly robust over the last two decades, leading to what is known as the search economy (Vise 2005). One reason is that digital convergence has led to overwhelming quantities of information being produced, necessitating tools like search technologies. Also, convergence has led to competitive horizontal market segments in media in which search has excelled. Search engines are also value adding intermediaries. As an intermediaries, search engines compete not only by targeting a specific horizontal segment, but by providing services such as matching buyers and sellers, anonymity, reducing transaction costs, and conferring trust on sellers. The degree to which a search engine excels at intermediation-related services is strongly tied to its success.

What do the preceding theories and trends mean for the future of the search industry? If current trends toward digital intermediation and convergence continue, the impact on retail products is that people may less frequently go directly to commercial sites like eBay, Amazon, and Walmart.com. Instead they may rely on search to find the best products through a single interface. This would result in a

tightening of channel control and put tremendous leverage over commercial websites into the hands of successful search engines. An additional future trend is that specialized search engines are expected to proliferate, and this trend has the potential to weaken the leverage that any single search engine has over commercial websites. However, specialized search engines may themselves be located through the use of the major search engines. It would be wise for researchers and government officials to consider the effects of allowing the specialized search engines to be owned or given preferential treatment by the major search engines in the years ahead. Further research in this area may consider theories of economic efficiencies and regulatory policies for this critical market space.

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Figures

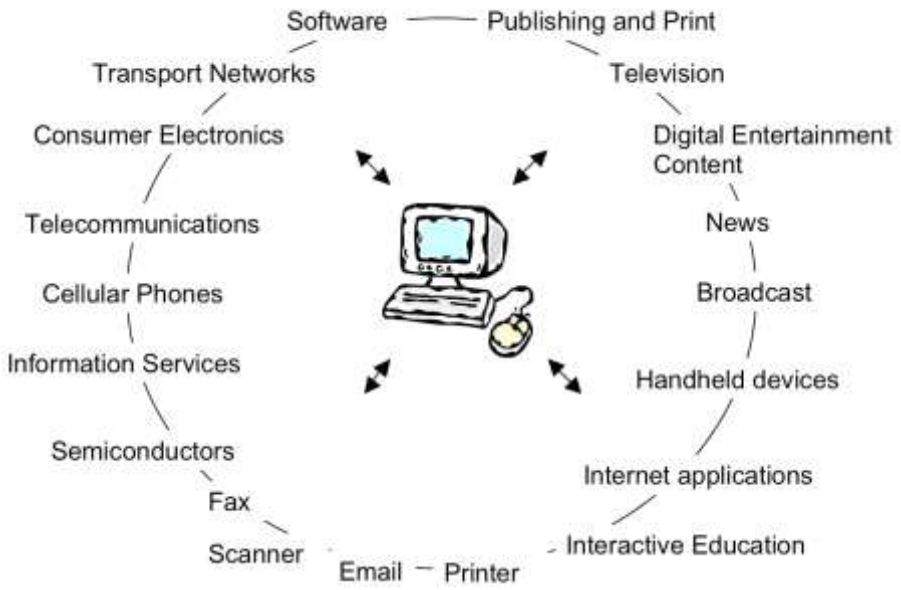

Figure 1. Computer as "Lynchpin" for Previously Separate Products

THE IMPACT OF INTERNET SCREENING ON JOB SEEKERS

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ABSTRACT

The purpose of this study was to explore how the use of Internet screening by employers can impact people seeking employment and to examine the benefits and consequences of employers using such a practice. Historically, employers relied upon a job candidate's résumé, interview performance, professional references, and criminal background check to evaluate a job applicant during the hiring process. Since the arrival of social media, employers now can expand employment screening beyond the traditional means of evaluation to any material that is searchable on the Internet.

INTRODUCTION

Social media has transformed one's ability to communicate. Information is near-instantaneous, and making connections with new people is now easier than ever (Baumhart, 2015). Undoubtedly, social media has made the world smaller. A simple web search of a person's name could point to multiple social media sites within minutes, and a variety of details can be found about someone, including photos and information about marital status, children, race, age, gender, religion, political affiliation, hobbies, and more (Davison, Hamilton, & Bing, 2012).

Many people may be posting personal information on social media sites with the intended audience of friends in mind, but often there is another audience that is not being considered potential employers (Stoughton, Thompson, & Meade, 2013). As an inexpensive alternative to traditional background checks, many employers are turning to Internet screening to evaluate job candidates. Employers often have access to personal information about the candidate that is not accessible during the interview process, and these Internet screenings can produce eye-opening results about a candidate (Miller, Parsons, & Lifer, 2010).

PURPOSE OF RESEARCH

The purpose of this study was to explore how the use of Internet screening by employers can impact people seeking employment and to examine the benefits and consequences of employers using such a practice. The research study answered the following questions:

1. What is Internet screening?
2. What are the benefits and consequences of employers using Internet screening?
3. How does Internet screening impact job seekers?

METHODOLOGY

A blend of primary and secondary research was used in this study. The secondary research included a review of scholarly literature that focused on social media and Internet screening and its impact on the hiring process. A review was also performed of the 2014 CareerBuilder survey that sampled more than 2,000 hiring managers who used social media sites to evaluate job candidates (Grasz, 2014).

The primary research focused on interviews with four hiring managers who were chosen

for the study based on convenience and accessibility. All participants were asked the same questions about the practice of Internet screening during the hiring process. The questions used in the interviews can be found in Appendix A. The managers represented a variety of fields including agriculture retail, civil engineering, information technology contracting, and healthcare management.

There were delimitations and limitations to the primary research in this study. The sampling size was delimited to four participants and may not be representative of larger groups. In addition, the research was limited by generational and gender differences which may have influenced the attitudes of participants and, therefore, influenced the results. Of the four hiring managers, three were male and one was female. The participants represented Generation X, Generation Y, and the Baby Boomers. Lastly, the data were self-reported.

DATA FINDINGS AND ANALYSIS

The following are the findings and analysis from the review of several scholarly articles, a 2014 CareerBuilder survey, and interviews with four hiring managers regarding the practice of Internet screening.

Internet Screening Defined

Internet screening is comparable to background checks in a new medium, except with more invasiveness because both job relevant and job irrelevant information can be gathered by the employer. Traditional background checks may investigate a person's criminal record, credit history, driving record, previous employment, and education; but much more can be learned through an Internet search. A quick review of a candidate's Facebook or Twitter site could reveal an applicant's number of children, marital status, religious affiliation, political views, and hobbies, among other personal information (Davison et al., 2012).

Several approaches to Internet screening include (a) the people directly involved in the hiring decision investigate the candidate's online presence; (b) an employee with no part in the decision-making process performs the Internet screening on the job candidate; or (c) a consumer reporting agency, a third party, performs the Internet screening and then reports to the employer (Reicher, 2013).

The Benefits and Consequences of Using Internet Screening for Employers

Social media allows employers access to information about a potential hire that they would not be allowed to gather during the job interview; and unlike criminal background checks, employers can research a job applicant's social media profile without making the applicant aware (Ebnet, 2012). Through an online search, it is possible for employers to discover information which is usually under the protection of federal employment discrimination laws, including a person's race, religious affiliation, gender, and national origin, which are covered under the Civil Rights Act of 1964; age, which is covered by the Age Discrimination in Employment Act of 1967; and disability status, which is covered by the Americans with Disabilities Act of 1990. This information may be gathered from a profile picture alone, which is usually available to the public on most social media sites and without the option to remove from public view. Additionally, a social media site profile picture gives employers the opportunity to make hiring decisions based

on factors which are not protected by federal law, including sexual orientation, physical attractiveness, and smoking habits (Brown & Vaughn, 2011).

Although tempting for some employers, it is unlawful to ask discriminatory questions during an interview, and even if the application offers job-irrelevant information, the employer is still prohibited from using the information to make a hiring decision (Sprague, 2011). These factors could introduce bias into the hiring process (Brown & Vaughn, 2011).

The practice of Internet screening could reduce the attractiveness of an organization if a large number of applicants are aware of the screening practice, especially if rejected applicants or disgruntled employees turn to Internet message boards or forums targeting job seekers to share details about a bad experience. This public display of dissatisfaction could affect the perceptions of those who may otherwise apply for positions at the company, giving job candidates a glimpse of future treatment and possibly discourage the acceptance of an employment offer. If an applicant does accept a position and is aware of the screening procedure, the likelihood increases for unfavorable attitudes while employed, leading to low job performance and turnover. Additionally, an applicant who feels an invasion of privacy may be more likely to pursue legal action, resulting in costly damages to an organization's reputation, customer loyalty, and shareholder value (Goldman, 2001). Employers should focus on how they treat applicants just as applicants should focus on providing a good impression to employers (Blacksmith & Poeppelman, 2014).

It is nearly impossible to confirm the validity of information found on social media sites, and the information discovered during Internet screening could possibly be misleading or inaccurate. For example, a social media site could be created as a personal attack or practical joke and, therefore, contain completely false information about someone (Weathington & Bechtel, 2012). The information on a job candidate's social media site is not necessarily more accurate than the information provided during an interview or on a résumé. A person may create a social media site with certain viewers in mind, and the site may not be a true reflection of the user's personality. For example, an individual may "fake good" on Facebook if the intended audience is family or potential employers or "fake bad" if the intention is to impress friends or potential mates (Davison, Maraist, & Bing, 2011). In addition, job applicants may be more likely to tailor online behavior to match the evaluation criteria of an employer if aware of the employer's practice of Internet screening (Bangerter, Roulin, & Konig, 2012).

The Impact of Internet Screening on Job Seekers

Many job applicants use social media as an informal means of communication and may leave traces of unfiltered data, not intended for employers, on blogs, tweets and posts on Facebook. This social communication could offer employers a glimpse into the uncensored life of a potential hire and could be used in the evaluation process (Stoughton et al., 2013).

Online content created through social media is often permanent, which can make hiding an online history more difficult (Ebnet, 2012). People who send uncensored messages and photos over Twitter and Facebook are not likely to consider the long-term effects before making such decisions.

The Internet and social media have made communication near-instantaneous, widespread, and indefinitely stored; and erasing online content is often limited if not impossible (Baumhart, 2015).

Users of social media may be overestimating the privacy protection settings on certain sites. For example, Facebook users can decide which audience is able to view their profile; but since anybody who has access to the user's information is able to download it, the information is not as much private or controlled as it is public. Even with the option of privacy settings, not all Facebook users want to use them (Ebnet, 2012).

It is suggested that some people, especially college students, prefer to use social media to express themselves and make connections with similar people. It is also believed that some Facebook users intentionally misrepresent themselves as a means of gaining social acceptance (Peluchette & Karl, 2009). In a recent study, people with unprofessional social media sites not only lost more job opportunities, but also were offered a lower salary than those individuals with professional, family-oriented social media sites (Bohnert & Ross, 2010).

Social media sites, such as LinkedIn, are designed as professional environments for people to network with colleagues and prospective employers and to share information about employment history and education. On the opposite side are social media sites like Facebook and Twitter which are designed as more casual environments for people to connect with friends and family and to share information about one's social life. These types of personal sites are not designed with colleagues or prospective employers in mind (Stoughton, Thompson, & Meade, 2015).

Internet Screening Can Hurt Job Seekers

In a recent survey by CareerBuilder, more than 2,000 hiring managers were asked to identify what they found during an Internet screening that led to the elimination of a job candidate from consideration of employment. The top reasons included postings of provocative or inappropriate photographs or information (46%), postings of drinking or drug use (41%), badmouthing previous employer or fellow employee (36%), displaying poor communication skills (32%), posting discriminatory comments (28%), and lying about qualifications (25%), as can be seen in Figure 1 (Grasz, 2014).

The primary research in this study focused on interviews with four hiring managers who represented the fields of agriculture retail, civil engineering, information technology contracting, and healthcare management. Three managers frequently used social media as a screening tool and one manager did not practice and did not have plans to practice Internet screening. The hiring managers gave the following reasons for practicing Internet screening: to save time and help reduce the number of candidates to interview, to find out if the job candidate is lying about résumé, to find out if the job candidate is badmouthing current employer, to get a real-life perspective of the job candidate, and to determine a job candidate's character, as can be seen in Figure 2.

According to the hiring managers, the following was found on social media sites of potential hires that led to the elimination of the candidate from consideration: poor communication skills, lack of professional networks, postings of scantily-dressed photos, disrespectful comments, badmouthing previous employer, and lack of

real-world experience, as can be seen in Figure 3.

The CareerBuilder survey also identified what employers found during an Internet screening that led to them hiring a job candidate. The most common reasons were: appeared to be a good fit within the company culture (46%), background information supported professional qualifications for the job (45%), social media site conveyed a professional image (43%), well-rounded and showed a wide range of interests (40%), great communication skills (40%), and creative (36%), as can be seen in Figure 4 (Grasz, 2014).

According to the hiring managers, the following was found on social media sites of potential hires that led to the candidate being hired: good communication skills, a professional profile, site consistent with résumé qualifications, proof of real-world experience, well-rounded, and creative, as can be seen in Figure 5.

The shared reasons for passing on a job applicant in the CareerBuilder survey and in the interviews with the hiring managers were: inappropriate photos, badmouthing, poor communication skills, and disrespectful comments. The CareerBuilder survey found that drinking/drug use was the second highest reason for employers to pass on an applicant; but in the interviews with hiring managers, drinking/drug use was not a reason at all. In the interviews with hiring managers, the lack of real-world experience was a reason for passing on an applicant that was not found as a top reason by the CareerBuilder survey.

The interviews with the hiring managers and the CareerBuilder survey also found similar reasons for hiring an applicant after an Internet screening, including the following: good fit with company culture, information supported qualifications on the résumé, professional site, well-rounded, creative, and good communication skills. The CareerBuilder survey found that being a good fit with the company culture the highest for managers to hire an applicant, but in the interviews with the hiring managers, fit was not a reason at all. The interviews with the hiring managers found that proof of real-world experience was a top reason for hiring a candidate, but was not a top reason found in the CareerBuilder survey.

CONCLUSIONS

The number of employers using social media sites to evaluate job candidates during the hiring process is growing quickly. While résumés and interview performance still remain the major determining factors in the hiring process, many employers are using Internet screening in addition to or as an alternative to background checks. Through Internet screening, employers often learn information about job candidates that they would not be able to learn during the job interview. Many people are unaware of the long-term effects that inappropriate material on social media sites can have on future job opportunities and of the importance of properly managing privacy control settings on social media sites. The line between public and private information in cyberspace is often blurred, and the issue of fairness with using Internet screening is a common debate. Employers could face potential consequences of using such a practice, including discrimination lawsuits, negative attitudes of the job candidates involved in the screening, and damages to an organization's reputation.

RECOMMENDATIONS

Based on the findings in this study, it is recommended that social media users practice self-censorship when posting content to personal sites like Facebook and Twitter. Social media users should be aware that personal sites may not be treated as a private environment by employers, and since employers are increasingly using Internet screening in the hiring process, any inappropriate content could lead to a job candidate's elimination of consideration. Ultimately, users should understand the limitations to and the usefulness of using privacy control settings on social media sites.

It is recommended that employers consider the consequences of practicing Internet screening as an evaluation tool in the hiring process. An employer should understand that information on social media sites may be misleading or inaccurate and that Internet screening could potentially introduce bias into the hiring process. Finally, employers should be aware of federal laws that protect applicants from discrimination and of recent legal issues that question the lawfulness of Internet screening.

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Appendix A: Interview Questions Asked of Hiring Managers

1. Do you screen the social media sites of job candidates as part of the hiring process?
2. If no, do you plan to use Internet screening practices in the future?
3. If yes, what are your reasons for practicing Internet screening?
4. What have you found on social media sites of potential hires that promoted you to eliminate them from consideration?
5. What have you found on social media sites of potential hires that made you more likely to hire them?

Appendix B: Figures

Figure 1.
CareerBuilder Survey: Top Reasons Employer Passed on Applicant

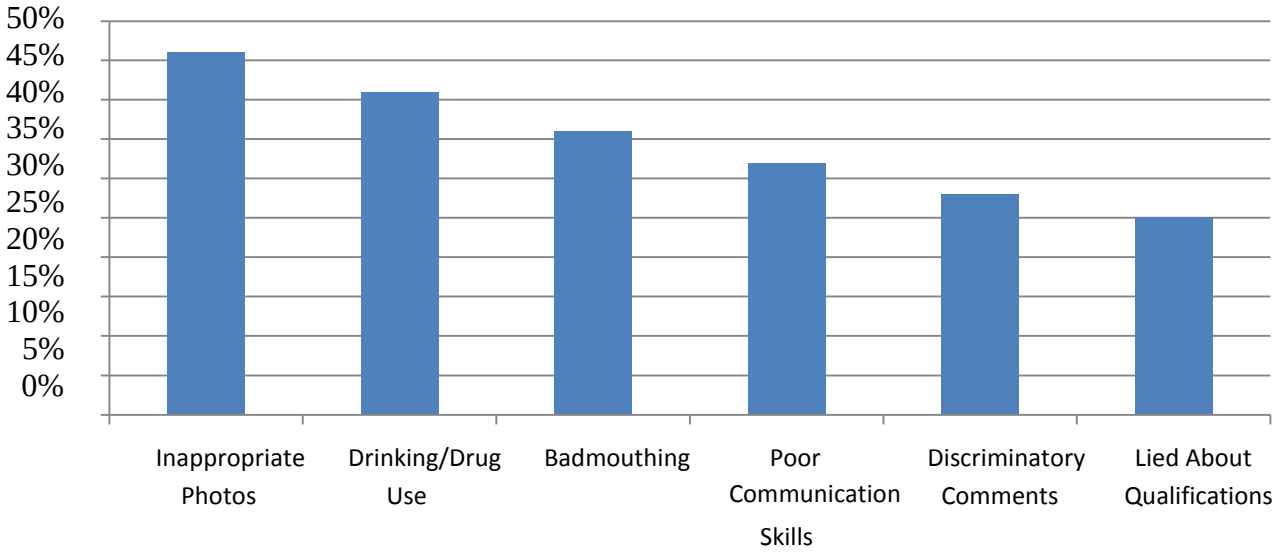

Figure 2.
Interviews with Hiring Managers about Internet Screening:
Reasons for Practicing Internet Screening

Represented Professional Field	Top Reason(s) for Practicing Internet Screening
Agriculture Retail	Internet screening is not practiced
Civil Engineering	To save time by reducing number of candidates to interview
Healthcare Management	To find out if candidate is lying on résumé or badmouthing
Information Technology Contracting	To get real-life perspective & determine character of candidate

Figure 3.
Interviews with Hiring Managers about Internet Screening:
Top Reasons Employer Passed on Applicant

Represented Professional Field	Top Reason(s) for Passing on Applicant
Agriculture Retail	Internet screening is not practiced
Civil Engineering	Poor communication skills; lack of professional networks
Healthcare Management	Scantily-dressed photos; disrespectful comments; badmouthing
Information Technology Contracting	Lack of real-world experience

Figure 4.
CareerBuilder Survey: Top Reasons Employer Hired Applicant

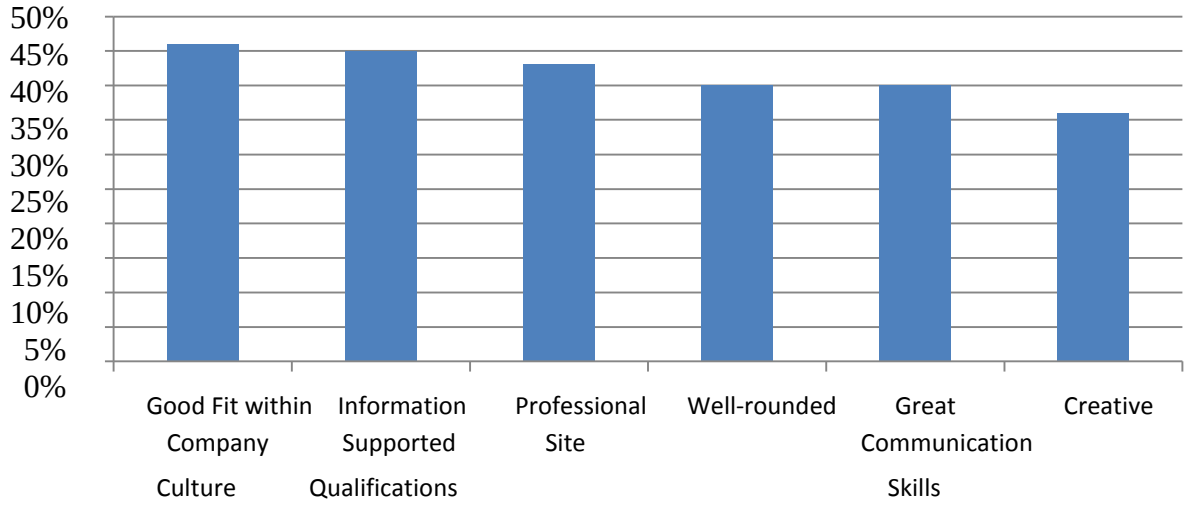

Figure 5.
Interviews with Hiring Managers about Internet Screening:
Top Reasons Employer Hired Applicant

Represented Professional Field	Top Reason(s) for Hiring Applicant
Agriculture Retail	Internet screening is not practiced
Civil Engineering	Good communication skills
Healthcare Management	Professional profile; site consistent with résumé qualifications
Information Technology Contracting	Proof of real-world experience; well-rounded, creative

INFORMATION AVAILABLE FOR PROSPECTIVE ONLINE STUDENTS ON UNIVERSITY WEBSITES

Sherry Rodrigue, Nicholls State University
Ronnie Fanguy, Nicholls State University
Lori Soule, Nicholls State University
Betty Kleen, Nicholls State University

INTRODUCTION

As more and more colleges and universities add online formats for degree completion in addition to their more traditional face-to-face delivery, a university wishing to research its own online structure and procedures has many programs to investigate. Websites of hundreds of schools can be studied for layout and content best practices, as well as internal design for online degree administration, academic services, and student services offered to online students.

More bachelor's degrees have been awarded in business than in any other discipline in recent years, according to the National Center for Education Statistics (2013). Based on research related to demand for such a program, the authors' mid-sized public university in the south also added a fully online business degree within the past 18 months. (This timeline represents timing of paper written in September, 2015.) The business major was added to the offerings in the University's online degree program structure that is currently in its fourth year of operation.

Given the number of well-established online degree programs in the country, the authors' university initially looked at many materials and websites to help those tasked with designing both operational procedures and structure of the original online division. Given the subsequent student response to the online programs, the University is now beginning a review to determine whether any procedures and structures need to be modified to support the growth potential. As an example of why it is time to question such structure, the enrollment in the online business degree program now represents approximately one-third of all students enrolled in fully online programs at the University. Some other issues have also emerged, including the following: a single faculty member within the Computer Information Systems department advises all the online business degree students; in addition to advising needs, students continue to have questions that suggest certain administrative, student, and academic information is not getting to them expediently; students are not allowed to self-enroll in courses. Both administrators and faculty are questioning whether best practices are being employed in all aspects of the online programs.

LITERATURE REVIEW

Much has been written about online programs at the postsecondary level over the past fifteen years. Today a simple web search can identify numerous articles presented in easy-to-understand terms that help guide a student in how to pick the right online degree program and school ("A step-by-step guide to choosing an online degree"; "how to choose the right online education

program"). Sheehy (2012), writing for US News, also helps students distinguish the good from the bad schools and programs. Articles such as the above focus on the need for prospective students to consider issues such as school accreditation, program offerings, credit for prior courses, ability to transfer courses completed online to other schools, quality of support service, academic counseling, financial aid information without "pushy" counselors, technical support, and even completion rates and student reviews.

Other literature related to online education focuses on various administrator and administrative structure of successful online programs (Alexander, 2015; Allen & Seaman, 2013; Buckley & Narang, 2014; Chambers, 2004; Davis, 2011; Hoey, McCracken, Gehrett, & Snoeyink, 2014; and Kuruvilla, Norton, Chalasani, & Gee, 2012). Consistent themes in these articles support the need for careful design of administrative structures and academic structures that best support online learners to ensure quality programs and good completion rates. Yet other articles focus more directly on the importance of supporting online students through the student services aspect of a postsecondary institution (Crawley, 2012), and importance of effective student-advisor interaction to retain online students (Gravel, 2012; Ragin, Burrell, & Flowers, 2014).

Effective orientation for online learners has received less attention in the literature, although Cho's developmental study (2012), reported on the usefulness of a four-module student orientation program. The modules included (1) the nature of online learning, (2) how to learn in a course management system, (3) technical requirements students must have/meet, and (4) learning skills and motivations students need to succeed in online learning.

Various organizations also provide annual "best schools" lists, including best online schools, which can also provide helpful information to prospective online learners. One such organization is thebestschools.org, which provides in-depth rankings and generates a listing of "The 50 Best Online Colleges" (2015). Using a multicriteria evaluation, thebestschools.org balances such things as academic excellence, a student's return on investment, and other indirect or secondary benefits in determining these rankings. Factors such as scholarly strength of faculty, online teaching methods, tuition costs, reputation, awards, financial aid, and range of degree programs were also considered in this ranking system. The most recent list largely encompasses traditional campus-based schools that now also offer totally online degrees instead of those for profit schools offering online degrees only. The majority of the schools on the 2015-2016 list are public institutions.

PURPOSE OF THE STUDY

Because of the abundance of literature related to establishing and maintaining effective online degree programs and the abundance of websites of postsecondary institutions supporting online programs, the authors assessed that a review of schools identified as top online schools could potentially provide examples of best practices, procedures, and structure which could in turn help the researchers identify suggestions for change at their university.

The authors elected to review websites of the top 50 online universities as identified by thebestschools.org. Once this project was underway and shared with an administrator group on campus, a university-wide committee became interested in learning of the findings.

METHODOLOGY

The Nicholls State University online program website provides the following links: welcome, online degrees available, courses and schedule, tuition and fees, calendar, apply for admissions, frequently asked questions, where to go (lists where to go for help for numerous issues), student resources, video tutorials, and a "is Nicholls Online Right for Me" quiz (Nicholls Online, http://www.nicholls.edu/online). Considering those links, as well as the types of questions the business faculty advisor reports students raising throughout a semester, the authors created a list of website comparison factors and entered them into a spreadsheet to be used for data gathering. The authors also devised a coding system to use in recording data collected at the various sites. Drawing from thebestschools.org's 2015 listing of the 50 top online schools, 50 schools were used in the study. The authors chose this list in part because the focus is on recognizable colleges and universities in various states that are also known for their face-to-face, traditional structure for degree programs. The complete list of schools and their identified websites provided by thebestschools.org can be found in Appendix A.

Each of the authors completed a review of one-fourth of the schools; once data were collected, the authors met to identify questions and/or inconsistencies in the data collection prior to data analysis. The study did not investigate academic excellence or return on investment of the schools reviewed. The focus of the study was to identify common and best practices concerning such things as program structure and conveyance of important information for prospective online students.

FINDINGS

Using the list of "The 50 Best Online Colleges for 2015-2016" as researched and rated by www.thebestschools.org, the authors reviewed all 50 websites and recorded findings on an Excel worksheet containing the list of programs and topics to be researched. All 50 schools offered various bachelor's degrees through online programs, with 94 percent also offering various master's degrees, and 58 percent offering doctoral degrees. Over three-fourths (78 percent) of the schools also offered various post baccalaureate and post graduate certificates through their online programs.

As a means of testing how quickly a prospective student might find a school's website, a Google search was conducted using "online degrees in [state]." As reported in an earlier presentation (Rodrigue, Fanguy, Soule, & Kleen, 2015), 68 percent of the schools were listed as the first result for their state, and the other 32 percent were somewhere on the initial results page. In that same paper, the authors reported that when each school's website was reviewed, 50 percent of the schools listed the online program on the main webpage. When looking to see if the online program was located on a drop-down menu on the main school webpage, 58 percent of

the schools did have the online program listed.

The authors' university invites online students to connect with the school's community through Facebook, Twitter, and YouTube, and another question in the study gathered information as to what social media other universities were using to connect with online students. As reported in an earlier presentation (Rodrigue, Fanguy, Soule, & Kleen, 2015), only 84 percent clearly listed social media in use within the online programs site, with Facebook (84 percent), Twitter (78 percent), and YouTube (64 percent), being the most often used. One school in particular clearly identified the use of an online community specifically for distant learners.

Another important segment of the research addressed in this paper looked at each school's website to address whether a school provided prominent information on key topics of importance to prospective students, either through a main FAQ section or clearly identified links from a main online program page. These topics had been identified by the authors as important questions prospective students want to read about and research on their own before actually selecting their final choice of an online school and program. The websites were reviewed to determine what information students could find by themselves, before committing their name and contact information to an email information request and a potential "hard sell" by an institution's staff. Topics included financial aid, admissions, transfer credits, course completion structure (such as quarter, semester, or short term), fees due, data of next term, advising, registration, and drop dates.

In this current paper presentation, the authors chose to provide an extended comparison beyond simple counts and percentages of the 50 schools in total. Table 1 provides a comparison on topics available at (1) the authors' university, (2) the percentage of the entire 50 schools researched, (3) the percentage of schools 1-10 of the 50 schools list, and (4) the percentage of schools 41-50 of the 50 schools list. As Table 1 displays, financial aid help or FAQs (92 percent) and admission information or FAQs (88 percent) were typically offered. Although readily available guidelines found in numerous articles on the web concerning choosing an online school remind students to check for transfer credit capability and fees, less than 75 percent of the school websites provided this information for prospective students. Only a little more than half even identified dates of next term in an easy to find manner. The majority of the websites, 98 percent, provided a contact phone number, while only 14 percent provided a specific contact name or office with which the student could communicate. Emails were apparently preferred so they could perhaps be monitored or addressed by more than a single staff person. Providing immediately accessible information about the graduation process is apparently not a high priority for many online programs.

When comparing the top 10 schools on the list (1-10) to the bottom 10 (41-50) for items reported in Table 1, there was not much difference found. The topics with the most variance was registration; 8 of the 10 top schools provided information while only 3 of the 10 bottom schools did. The authors' school compared favorably to the 50 best schools, providing information about 9 of the 11 topics listed.

Table 1: Information Readily Available for Prospective Students without Phone Calls or Email Inquiry

Topic	NSU	50 Best Schools	Schools 1-10	Schools 41-50
Financial Aid	Y	92%	10	9
Admission	Y	88%	10	8
Fees Due	Y	74%	10	9
Transfer Credit	N	64%	5	7
Registration	Y	64%	8	3
Advising	Y	56%	5	6
Dates of Next Term	Y	54%	6	8
Drop Dates	Y	54%	6	5
Graduation Process	N	30%	3	1
Contact Phone No.	Y	98%	10	9
Contact Office/ Person	Y	14%	1	1

The authors' university follows a short-term structure of five eight-week sessions, with classes beginning in January, March, June, August, and October for the online degree programs; this information is clearly presented in the online program webpage. This structure has created some challenges for faculty, and some question whether this structure should be changed to simply match the regular 15-16 week semester structure. A review of the 50 best online schools revealed that 50 percent offered special online terms, while 56 percent followed a typical university semester term (a few schools offered flexibility of either typical semester terms or special online terms depending on program selected). In some instances the information was not readily available unless a prospective student placed a phone call or sent an email inquiry.

Since the popular literature also suggests that prospective students research to identify what technology would be required to complete a school's online degree and the level of support available, a section of the overall analysis looked at various online training for the technology available on the websites. The authors' university provides several training videos that prospective online students can review, including use of the course management system, time management tips, computer skills, communication strategies, and access for the Banner system and email. As displayed in Table 2, the most frequent training provided by the 50 schools focused on the specific course management system the students would be using for their coursework. Sixty-eight percent of the schools provide prospective students with information about the course management system (CMS), either as an overview of how to use the specific CMS of the school, or even a demonstration online course. Slightly more than 50 percent provided a variety of other training support, and slightly less than 50 percent provided some training related to registration for coursework. When comparing the top 10 schools on the list (1-10) to the bottom 10 (41-50), several areas were significantly different. More of the top 10 schools provided website assistance with registration and email, while more of the bottom 10 schools provided website assistance with login help and general online training concepts.

Table 2: Types of Support Readily Available for Prospective Students without Phone Calls or Email Inquiry

Type of Support	*NSU*	*50 Schools*	*Schools 1-10*	*Schools 41-50*
Course Management System	Y	68%	8	8
Login	Y	64%	6	9
Training	Y	52%	5	9
Registration	N	48%	8	3
Email	Y	36%	5	1

Because the authors were initially concerned about the advising load of one business faculty member for all business majors, specific degrees offered in a totally online format and advising procedures were also researched on each website. In addition to several non-business degrees, the authors' university currently offers a single business degree, business administration, in a fully online format. As Table 3 displays, 76 percent of the 50 best online schools offered an online MBA. At the undergraduate level, the most popular degree was a general business (or generalist business administration), with 60 percent of schools offering that degree. The degrees of computer information systems (CIS), management (MNGT), marketing (MKTG), and accounting (ACCT) were available at 54 percent, 52 percent, 46 percent, and 40 percent of the schools, respectively. The degrees of finance (FINC) and economics (ECON) were only available at 16 percent and 10 percent, respectively. When comparing the top 10 schools on the list (1-10) to the bottom 10 (41-50), differences were found in availability of Management and Marketing degrees; significantly more were offered at the schools ranked 41-50. Economics was the only degree offered at 2 of the 10 top schools and not at any of the bottom 10 listed schools.

Table 3: Types of Business Degrees Awarded

Business Degrees	**NSU**	**50 Best Schools**	**Schools 1-10**	**Schools 41-50**
MBA	N	76%	9	9
General Business	Y	60%	6	6
CIS	N	54%	7	6
MNGT	N	52%	2	10
MKTG	N	46%	1	6
ACCT	N	40%	2	3
FINC	N	16%	1	1
ECON	N	10%	2	0

The authors researched two questions concerning advising and registration. The first question focused on whether there was a dedicated advisor for online business students. Again, this information was not readily available on all school websites. Twenty-eight percent of the schools did have a dedicated business advisor while 36 percent did not. The information available to prospective students did not reveal whether the dedicated business advisor was a full-time advisor (staff) or a faculty member. The availability of a dedicated online advisor could not be determined at the remaining 36 percent of the schools without a specific email inquiry or phone call.

Table 4: Online Advising for Business Students and Student Registration

	NSU	**50 Best Schools**	**Schools 1-10**	**Schools 41-50**
Dedicated advisor for business students?				
Yes	Y	28%	1	3
No		36%		1
Unknown		36%	9	6
Student self-enrollment in courses?				
Yes		58%	8	3
No	N	4%		1
Unknown		36%	2	6

A related question concerned whether students were able to self-enroll in their courses; online students are not permitted to self-enroll at the authors' university. Fifty-eight percent of the 50 schools did allow students to self-enroll while 4 percent clearly did not. The process of a student being able to self-enroll could not be determined at 36 percent of the schools. When comparing the top 10 schools on the list (1-10) to the bottom 10 (41-50), in only 1 of the top 10 schools was an advisor for business students clearly identified, while 4 of the bottom 10 schools listed such an advisor. In addition, 8 of the top 10 schools allowed students to self-enroll in courses in

the online program, while it was only clear that 3 of the bottom 10 had that capability.

CONCLUSIONS, IMPLICATIONS, AND FUTURE RESEARCH

As online programs continue to grow in colleges of business, schools will choose different approaches for administration, academic structure, and student advising/registration. As this study revealed, not all schools directly advertised the use of social media as a way for students to follow the university and keep up with postings. Although the majority of the 50 schools researched did provide answers to some of the key frequently asked questions such as admissions, registration, financial aid, and schedules, by no means was the information easy to find in all instances. Many schools omitted information regarding some of the key questions, creating a situation where a student would have to submit an email inquiry or place a phone call for more information. While the authors' university provided information for 9 of the 11 topics, information about transfer credits was not specifically present. Prospective online students could find a variety of training videos and/or information sheets on many of the websites, but some schools provided little or no materials, missing an opportunity to help a prospective student feel confident about the student support the university might provide to online students. The authors' university had a good variety of videos and also provided a quiz prospective students could take to help them determine if they were a good fit for online learning.

In an era of shrinking state budgets to support higher education, the number of faculty available to help with advising and actual registration of students in courses is often shrinking, especially since faculty are being asked to do more than ever before in many cases. Initial investigation of the websites of online business programs reveals that advising approaches vary among schools, but more than half do allow online students to self-register in courses, thus reducing staff and/or faculty time involvement in this aspect of online learning.

Since the authors' university online degree web page does not directly address the issue of transfer credits, one specific recommendation would be to add some information on this topic to the materials prospective students can review, especially since that is a topic the articles in the more popular literature suggest a student should research prior to selecting a program. Since the information about advisors and self-registration capabilities were not readily identified in approximately one-third of the websites, more depth of research should be conducted to better determine how these processes are handled in more schools.

Based on this initial review of the 50 best online schools' websites, no single approach is deemed a best fit for all online programs. The authors' next component of this research stream will be to design a set of interview questions to be addressed in individual phone interviews with the appropriate online learning administrators at each of the 50 schools whose websites were reviewed in this study. This will allow more depth of understanding concerning such issues as frequency of communication with online students and specifics of policies and procedures not identified through visual

review of the websites. The authors will also work with a university-wide committee to determine what additional questions they would recommend adding to the interview scripts. Results of the interviews will be incorporated into a report for the University, as well as incorporated into future research articles for publication.

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APPENDIX A

List of Schools Researched and their Website Addresses

List obtained from: www.thebestschools.org/rankings/best-online-colleges/

1. Penn State World Campus, www.worldcampus.psu.edu
2. University of Florida distance Learning, www.distance.ufl.edu
3. UMass Online, umasonline.net/
4. Boston University, www.bu.edu/online/
5. Northeastern University, northeastern.edu
6. Indiana University, IU Online, online.iu.edu
7. Arizona State University, ASU Online, asuonline.asu.edu/
8. Florida State Univ. Office of Distance Learning, www.fsu.edu
9. Drexel University, Drexel Online, www.drexel.edu
10. Oregon State University, OSU Ecampus, ecampus.oregonstate.edu
11. Rochester Institute of Technology, RIT Online, rit.edu/ritonline/
12. Washington State University Global Campus, globalcampus.wsu.edu
13. Mizzou Online, University of Missouri, online.missouri.edu
14. Colorado State University-Global Campus, https://csuglobal.edu
15. University of Central Florida, ucf.edu
16. Liberty University Online, https://www.liberty.edu/ms/libertyonlinedegrees/
17. Robert Morris University, RMU Online, rmu.edu
18. Univ. of AL Birmingham, UAB Online, https://www.uab.edu/students/acdemics/item/959-online-courses

19. University of Minnesota Crookston, www1.crk.umn.edu
20. Northern Arizona University, NAU-Extended Campuses, ec.nau.edu/OnlineDegrees.aspx
21. Florida Institute of Technology, Florida Tech University Online, floridatechonline.com
22. University of North Dakota, und.edu
23. Everglades University, evergladesuniversity.edu/index.asp
24. University of Illinois Springfield, uis.edu
25. Western Kentucky University, wku.edu
26. Regis University, regis.edu
27. Missouri State University, missouristate.edu
28. New Mexico State University, nmsu.edu
29. Fort Hays State University, Virtual College, fhsu.edu/virtualcollege/
30. University of Louisiana at Monroe, ulm.edu
31. Lewis University, lewisu.edu
32. Huntington University, huntington.edu
33. University of Southern Mississippi, usm.edu
34. Indiana Wesleyan University, indwes.edu
35. California Baptist University, CBU Online, cbuonline.edu
36. Regent University, Regent Online, regent.edu/academics/online_courses/regent_online_overview.cfm
37. Upper Iowa University, uiu.edu
38. Champlain College, champlain.edu
39. Dakota State University (in Madison, SD), dsu.edu
40. University of Memphis, UM Online, Memphis.edu/uofmonline/
41. Lamar University, lamar.edu
42. Florida International University, fiu.edu
43. East Carolina University, ecu.edu
44. Nova Southeastern University, nova.edu
45. Brenau University, brenaudegree.com
46. Saint Leo University Online, online.saintleo.edu
47. Limestone College, limestone.edu
48. Kennesaw State University, Kennesaw.edu
49. Old Dominion University, odu.edu/#prospective
50. Concordia University-Saint Paul, csp.edu

EXAMINING THE RELATIONSHIPS OF UNIVERSITY STUDENT CHARACTERISTICS AND MOTIVATION IN A BLENDED DIGITAL LITERACY COURSE USING THE KELLER ARCS MOTIVATION MODEL

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ABSTRACT

The purpose of this study was to examine student motivation in a blended learning digital literacy course and its relation to non-performance-based and performance-based student characteristics. The study consisted of 136 student participants enrolled in a blended learning digital literacy course at a Midwestern university. The Keller ARCS Motivation Model served as the theoretical framework for the study. The model is divided into four categories: Attention, Relevance, Confidence, and Satisfaction (Keller, 2010). The model further provided the Course Interest Survey, a situational instrument designed to measure motivation in each of the four categories in an Instructor-led course. Data for the study was provided through the administration of the Course Interest Survey to voluntary student participants and through data obtained from the research setting. The study examined the four motivational categories (attention, relevance, confidence, satisfaction) and how they related to non-performance student characteristics (age, gender, academic rank, race/ethnicity), pre-course performance student characteristics (pre-course digital literacy, high school GPA, ACT score), and post-course performance student characteristics (post-course digital literacy, change in digital literacy).

INTRODUCTION

University enrollment growth in the United States is expected to increase by nearly 14% in the next decade (Hussar & Bailey, 2014). Driving this increase in enrollment may be attributed to employers' demand for graduates. In 2009, it was reported that approximately 55% of employment in the United States required postsecondary education and was expected to continue to rise in the near future (Oblinger, 2012). This increase in enrollment, along with innovations in technology and systems, has encouraged universities to expand and deviate from two course types: on-campus and online, to four course types: traditional, web-facilitated, blended/hybrid, and online (Allen & Seaman, 2013). The main distinction between these types of courses is the amount of content delivered online. Traditional courses deliver no content online, while web-facilitated courses deliver up to 29% of the course content online. Blended courses deliver up to 79% of content online, and online courses deliver 80% or more of the content online.

This study focused on the blended course type, commonly referred to as blended learning. Blended learning is the most preferred learning model for college students (Dahlstrom, Walker, & Dziuban, 2013). This term is defined as "the range of possibilities presented by combining Internet and digital media with established classroom forms that require the physical co-presence of teachers and students" (Friesen, 2012). While blended learning can deliver a large portion of content online (up to 79%), the reduced face-to-face time is important to blended learning (Allen, Seaman & Garrett, 2007; Sahare & Thampi, 2010).

In order to examine motivation in the blended digital literacy course, the Keller ARCS Motivation Model provided the framework to measure motivation and was one of the first motivation models to apply motivational factors to learning environments regardless of the mode of delivery (Smith & Regan, 2004). Keller (2006) lists four factors of motivation: Attention, Relevance, Confidence, and Satisfaction. These motivational factors, along with student characteristics, were analyzed in the study to examine the possibilities of certain student characteristics being related to motivational measures from the Keller ARCS Motivation Model.

Statement of the Problem

Technology has expanded and enhanced the traditional learning model in higher education. With a new generation of students armed with digital literacy skills, the learning environment has become increasingly complex, technological, and varied. Although motivation-based research on online and other models has occurred, at the university level no research could be found on the relationships of student characteristics and motivation in a blended learning model. Understanding the components of student motivation through Keller ARCS Motivation Model that could identify student sub-groups may assist faculty in planning better content delivery and instructional design for student engagement, motivation, course completion, and degree attainment.

Purpose of the Study

The purpose of this study was to examine the possible relationships of university student characteristics and perceived motivation in a blended digital literacy course. By examining these possible relationships, faculty may gain a better understanding of how student characteristics may impact motivation in a blended course design. This study attempted to increase understanding of motivation in today's university students, as well as help to provide a process for faculty to examine motivational levels of students in a blended course design in relation to student characteristics.

Significance of the Study

University students beginning their education in colleges and universities are considered members of a technology-enhanced generation (Barton & Skiba, 2006; Palfrey & Gasser, 2008; Martinez, 2009; Koutropolous, 2011). This has changed the way universities are delivering content to students along with a restructuring of the learning environment (Craig, 2007). At the research setting, all courses require the use of web-based technologies, regardless of the learning model used.

The results of this study can assist university faculty in course design and evaluation at the research setting and at other universities. By providing data and insight into university student motivation for initiatives, the results can also inform strategic planning initiatives in technology acquisition and use at the research setting and beyond.

Limitations of The Study

Participants may have shared desirable responses instead of honest responses with the researcher due to the researcher being an instructor at the university.

Students may have developed adequate knowledge and use of available web-based technologies beyond the content of the

course, and may not have been motivated by the course.

Participants existed only within the on-campus population of the university. Virtual students may not perceive the same motivational elements as on-campus students, and the findings may not pertain to all populations of students due to the nature of the survey instrument.

This study was conducted at a Midwestern University; the research findings may not be transferrable to other universities.

This study may only provide a small glimpse into the complexities of motivation. Other student characteristics may exist that have a significant impact upon the results.

Some on-campus university students may have been excluded from the study due to an insufficient number of class sections being offered for enrollment.

Some students may have dropped the course before the survey was administered. This could have been due to lack of motivation by the course and would not be included in the findings.

Delimitation of the Study

The researcher limited the population of the study to on-campus university students, as the on-campus sections of the digital literacy course were the only sections that used a blended learning model.

LITERATURE REVIEW

The Digital Native

Technology has become a foundational part of postsecondary education and has forced universities to change, adapt, and innovate into new areas through new instructional designs (Craig, 2007; Pritchett, Wohleb, & Prichett, 2013). Incorporating technology into the learning environments has not been without reason. Students in postsecondary education today consist of digital natives, or those that can inherently use technology (Prensky, 2001). These students have used technology in many aspects of their lives, for their entire lives, including learning (Barton & Skiba, 2006; Palfrey & Gasser, 2008; Martinez, 2009; Koutropolous, 2011). Considered anyone born after 1980, digital natives react well to technology-infused learning environments and typically possess an array of technology skills (Prensky, 2001; Palfrey & Gasser, 2008; Allen & Seaman, 2014). However, these digital natives vary largely when demographical factors are considered, such as race, gender, location, socioeconomic status, and educational background (Koutropoulos, 2011). The challenge for faculty is how to motivate these ‘new’ students in the ‘new’ learning models.

Integrating Technology into New Learning Models

With technology use as a common characteristic for digital natives, the new university students, courses are being redesigned and enhanced to accommodate technology. Using technologies such as wikis, learning management systems, interactive modules, web-based tools, laptops, tablets, etc., educators have been able to enhance motivation and student learning in the United States (Hazari, North, & Moreland, 2009), Australia (Shih, 2011) and the United Kingdom (Prescott, 2014). As faculty become more skilled with these technologies, the average faculty reported high technology use (72%) and a positive attitude towards technology (70%) (Allen and Seaman, 2014).

For this study, the focus was on a blended learning course. The term *blended learning* involves the "range of possibilities presented by combining internet and digital media with established classroom forms that require the physical co-presence of teacher and students" (Friesen, 2012, p.1). Blended learning implements a slightly different approach to instructional design than web-facilitated and traditional learning. Not only does the instruction include more than 29% (up to 79%) of the content to be delivered by web-based technologies, it also reduces the amount of face-to-face instruction that occurs in the course (Allen & Seaman, 2014). Reduced face-to-face time is an essential part of blended learning (Allen, Seaman & Garrett, 2007; Sahare & Thampi, 2010). An important reason for the focus on blended learning is that it is the most preferred learning model for college students (Dahlstrom, Walker, & Dziuban, 2013).

Keller ARCS Motivation Model

The final form of the Keller ARCS Motivation Model incorporates four main categories to assess motivation, and these include attention, relevance, confidence, and satisfaction (Keller, 2010). This theory, or model, was evolved from the Expectancy-Value Theory developed by John Atkinson in 1964, and first used in education in 1983 to explain how motivation can relate to expected values and outcomes (Eccles, 1983). The final categories in the Keller ARCS Motivation Model were created by moving 'value' to the beginning of the model and dividing value into two categories, attention and relevance). 'Expectancy' became confidence, and satisfaction was added to the end of the model (Keller, 1987).

Keller (2010) referred to Attention as the most important category of the Keller ARCS Motivation Model, as without attention the other categories cannot be attained. Keller (2010) further defined attention as "Capturing the interest of learners; stimulating the curiosity to learn" (p. 45). Attention is divided into three main constructs: perceptual arousal, inquiry arousal, and variability. Perceptual arousal refers to simple changes in an environment, wherein inquiry arousal is a deeper sense of arousal, which is typically associated with mystery or knowledge-seeking behavior. Variability, on the other hand, refers to the variations that may be present or become present in the environment. This definition of Attention suggests that the blended learning environment may provide attention-based motivation to students. In previous research students have reacted positively to blended learning (Uğur, Akkoyunlu, & Kurbanoğlu, 2009; Echo360, 2011), suggesting that blended learning as a course design could increase Attention for typical university students.

Relevance is defined as "meeting the personal needs/goals of the learner to affect a positive attitude" (Keller, 2010, p. 45). It should be noted that relevance refers to perceived needs and not to the actual needs of the learner. Relevance contains three constructs: goal orientation, motive matching, and familiarity. Goal orientation pertains to the ability of the Instructor and/or the learning environment to establish an association between the goals of the learner (present or future) and the course in question. The positive attitude that a student feels in a learning environment and how comfortable the student feels in that environment matches the person's motives. This is referred to as motive matching. Familiarity is defined as the ability for a student to connect prior learning experiences

to the learning experiences that will/did occur in the course. In a blended learning design populated by digital natives, familiarity may be most applicable construct. The most preferred learning model for students today is the blended learning model (Dahlstrom et al., 2013). The first two constructs, goal orientation and motive matching, are highly dependent on the learner. Familiarity is more dependent upon the learning environment design than goal orientation and motive matching. Net Generation learners are considered to have an aptitude towards technology (Barton & Skiba, 2006), and by design a blended learning course incorporates a substantial set of technology through the use of web-based technologies.

"Helping the learners believe/feel that they will succeed and control their success" is the definition of confidence (Keller, 2010, p. 45). Confidence is created through the use of learning requirements, success opportunities, and personal control. Learning requirements can exist in different forms, but generally let the student clearly know what is expected of them during the course. Success opportunities are slightly different than learning requirements. While a learner may be required to complete an assignment, the assignment can also be a success opportunity. The balance is to provide learners with opportunities that alleviate boredom, but are not too challenging to likely cause failure. Personal control refers to how much control the learner has over the learning experience. A learning experience occurs in the learning environment, but is separate from the environment. Typically, the Instructor has control over the learning environment, but should attempt to allow the learner to have as much control over the learning experience as possible (Keller, 2010). A blended learning course, like virtually all other courses, consists of learning requirements. These requirements will outline the possibilities of success opportunities throughout the course. A blended learning course is different from other courses in the area of personal control. While possibly not having as much control as a completely online, self-paced course, a blended learning course can provide more personal control to learners through the use of the web-based technologies.

Satisfaction is defined as "reinforcing accomplishment with rewards (internal and external)" (Keller, 2010, p. 45). Satisfaction is composed of natural consequences, positive consequences, and equity. Natural consequences, as a construct, describe the processes a learner goes through in a course. During a course, a learner should develop new skills and have the opportunity to put those skills to use. 'Naturally', a learner should be able to perform tasks at the end of the course they could not perform at the beginning of the course. Another form of natural consequences also occurs through the use of praise. Positive consequences, on the other hand, can be similar to praise but in the form of rewards. These rewards can consist of mostly anything that provides positive recognition for achievements, etc. during the course. Equity is based on the previous two constructs, and is based on the idea that the consequences, when compared to other learners, are equitable. A reward or praise will provide less satisfaction if it is perceived by the recipient that it is 'lesser' than a reward received by another learner for reaching a comparable goal or achievement (Keller, 2010).

This motivation model also provides researchers with survey instruments in order to measure and assess motivation overall and within the four categories. The instrument used in this study was the Course

Interest Survey. The survey was modified with permission and designed to provide motivational scores of students in the blended learning digital literacy course examined in the study. The Course Interest Survey was designed by Keller to help measure students' reactions to instructor-led instruction. This survey was not designed to measure generalized levels of motivation, but instead, is designed to measure levels of motivation within a specific course. The survey consists of 34 questions, and can be analyzed based on each category of the Keller ARCS Motivation Model. The Course Interest Survey is modifiable, and can be scored using different scales. In this study, a 4-point scale from Strongly Disagree to Strongly Agree was used. The instrument can be scored in slightly different ways, depending on the goals of the researcher. Each value in the scale should be assigned a point value, and those points can be summed to provide a measure for each category. However, not all categories contain the exact same number of questions, so to compare categories, average scores can be used instead. Some questions on the survey are reversed scored to provide a less biased approach for the survey.

Blended Learning and Motivation

At the time of the literature review, a search on the ProQuest Dissertations and Theses database found 19,831 results for "student motivation." However, only 68 results were found with the addition of "blended learning" and "ARCS". Of these 68 results, none could be found that specifically focused on blended learning at the university setting. However, some studies on student motivation and blended learning do exist and were reviewed.

A blended learning environment is characterized as an environment with significant amount of course material delivered online with reduced face-to-face instruction (Allen & Seaman, 2013). The concept of blended learning, relative to research, is still new. Bluic, Goodyear, and Ellis (2007) suggested in their review that research on blended learning was rare before the 21st century. Research on blended learning in relation to motivation is relatively new. However, some studies have been conducted to examine motivation in blended learning.

In a 2009 study by Ugur, Akkoyunlu, and Kurbanoglu of 31 senior students in Turkey, the study revealed that the use of blended learning was considered highly positive in their learning environment. This study used a comparative – casual to examine the relationship between learning styles and views on blended learning. Data was collected using an information form, Kolb's Learning Style Inventory, a Scale On Learners' View On Blended Learning And Its Implementation Process, and open-ended questions. Student participants were enrolled in a blended section of an information literacy course. Descriptive statistics, and covariance analysis were used to find the results of the study.

Other research has shown similar results. A 2011 study by Echo360, a major software and lecture capture company, surveyed 11 major institutions located throughout the world found that of 2,420 student respondents, 84% agreed that blended learning improved their understanding of course material. The same study also found that 72% of students liked the flexibility of blended learning, and 68% would recommend peers to take a course using a blended learning format.

A recent research dissertation that examined blended learning in higher education

focused on students from underrepresented populations in a community college environment (Perlas, 2010). The traditional course sample consisted of 49 students, compared to 40 students in the blended course. These students were defined as academically disadvantaged, first generation college students and financial-aid eligible. The mixed methods dissertation researched motivational categories similar to the Keller ARCS Motivation Model, but did not use the Keller ARCS definition of the categories. Instead, Carey's Academic Motivation Profile definitions were used. These alternate themes of attention, relevance, confidence, and satisfaction were very similar to Keller ARCS Motivation Model categories. The study compared a traditional course and a blended course and found no statistical difference in motivation at the $p < .05$ level in all four categories of the Keller ARCS Motivation Model. However, the qualitative research found that the blended course did provide a positive impact of providing motivation to students. The qualitative research was conducted as a focus group with four participants. This suggests that although a blended course may not currently provide significant results in motivation for a special population of students, qualitative research did provide the possibility that motivation exists from a blended learning model.

At the community college level, Johnson (2012) studied first-year business students' motivational perceptions using a case study analysis of 18 first-year business students and 3 faculty members in an online course setting for his dissertation. The Keller ARCS Motivation Model was used as a theoretical framework in the dissertation. As one of the first research dissertations at the community college level to explore the motivational factors of the Keller ARCS Motivation Model through the perceptions and experiences of students and faculty, Johnson's research was able to find coded themes for each motivational category based on the perceptions of motivation of the students. In attention, variability was found to be the significant theme. Variability in this dissertation referred to the variability in the instructional items used in the course. In relevance, the significant theme was providing choices to students in the course. In confidence, the significant theme was progression of difficulty. Finally, in satisfaction, the significant theme was the ability for students to practice activities prior to grading. Johnson suggests in his research that further research should be conducted, particularly studies that focus on learning management systems and other settings.

At the university level, the researcher could find only one dissertation of the Keller ARCS Motivation Model and student motivational perceptions (Ogawa, 2008). The dissertation incorporated a mixed methods approach in a survey of 320 students regarding their graduate teaching assistants. Once the quantitative analysis was complete, Ogawa then used this data to select graduate teaching assistants based upon the most positive results from the survey. These graduate teaching assistants were then qualitatively researched to find relevant themes for instructional practices of the graduate teaching assistants based upon the Keller ARCS Motivation Model. Four common themes were found among the graduate teaching assistants. These themes included course coordinator/orientation, oral and written reflection, modeling of the undergraduate assistant that taught the present assistant as a student, and modeling of the supervisor of the teaching assistant. Two of these themes suggest that motivational behaviors can be passed from a mentor to student. Although the themes developed as a whole suggested the Keller

ARCS Motivation Model can improve instruction and do not pertain to students or course models, the researcher suggested that further Keller ARCS Motivation Model research should be conducted.

These studies and dissertations provide valuable insight into blended learning and motivation. Blended learning is perceived as a positive experience by students (Ugur et al., 2009) and is perceived to improve learning (Echo360, 2011). Blended learning has shown to provide motivation in qualitative research as well (Perlas, 2010). In online courses, variability, choices, progression, and practice all were perceived to increase student motivation (Johnson, 2012). For instructors, using the motivational practices from previous mentors may also influence the motivation of students (Ogawa, 2008). Although insightful, further research is needed to understand the impacts of blended learning on the motivation of students, the use of instructional technologies in these environments, and how student characteristics may influence motivation.

RESEARCH METHODOLOGY

This study used a quantitative research design. A quantitative design is typically conducted by measuring concepts with scales that provide numeric values, and then use statistical computations to test hypotheses (Zikmund, Babin, Carr, & Griffin, 2010).

Data Collection

Data was collected from available data (university and course data) and from collected data through the distribution of the Course Interest Survey. IRB permission was obtained prior to data collection, and all participation was voluntary in the study. Available data was collected through the learning management system and consisted of performance scores for participants. These scores consisted of a pretest administered at the beginning of the course and a posttest at the end of the course, both using the Atomic Learning Technology Skills Assessment (ALTSA). The ALTSA test is a standardized test that aligns with ISTE NETS-S 2007 standards (Atomic Learning, 2013). Other available data for the study was made available to the researcher through participant consent. Collected data consisted of surveys that were administered to voluntary participants in the course. The total 'population' of students (as defined by the Course Interest Survey that limits the population to one course with one instructor (Keller, 2010)), totaled 240 students. Of these students, 170 agreed to participate in the study, ultimately leading to available data for 136 participants.

Research Setting

The research study was conducted at a medium-sized, four-year public Midwestern university that had a 2014 enrollment of 13,411 students. Of these students, 36.6% were classified as on-campus students while 73.4% were classified as virtual students. This research setting is home to 28 academic departments and offers both bachelors and masters degrees on-campus and online. The undergraduate student population totaled 85.3% of the university student population in 2014. Of the undergraduate student population, 56% were declared as White, 5% declared as Hispanic, 4% declared as African American, and 1% as Asian. 31% of students were declared as simply "International". In the undergraduate population, 59% were female, and 41% were male. It was also reported that within the undergraduate population, 50% of students

referred to Kansas as their home and 31% of students declared another country besides the United States as their country of origin. The average age of an undergraduate student was 24 (Fort Hays State University College Portrait, 2014).

Research Questions

Research Question 1: Do statistically significant relationships exist between non-performance student characteristics (age, gender, academic rank, race/ethnicity) and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course?

Ho 1.1. There are no statistically significant differences between student age and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

Ho 1.2. There are no statistically significant differences between student gender and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

Ho 1.3. There are no statistically significant differences between student academic rank and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

Ho 1.4. There are no statistically significant differences between student race/ethnicity and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

Research Question 2: Do statistically significant relationships exist between pre-course performance student characteristics (pre-course digital literacy, high school GPA, ACT score) and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course?

Ho 2.1. There are no statistically significant differences between student pre-course digital literacy and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

Ho 2.2. There are no statistically significant differences between student high school GPAs and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

Ho 2.3. There are no statistically significant differences between student ACT scores and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

Research Question 3: Do statistically significant relationships exist between post-course performance student characteristics (post-course digital literacy, change in digital literacy) and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course?

Ho 3.1. There are no statistically significant differences between student post-course digital literacy and Keller ARCS Course Interest Survey scores for Attention, Relevance,

Confidence, and Satisfaction in a blended digital literacy course.

Ho 3.2. There are no statistically significant differences between student change in digital literacy and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

Data Analysis

A quantitative analysis was used in the study based upon the research questions and the structure/availability of the data. Multiple one-way multivariate analyses of variances (MANOVAs) were used to determine significant differences. If found, an ANOVA and Scheffe post hoc tests were used to further define these differences.

Multiple one-way multivariate analyses of variances (MANOVAs) were used to determine if significant differences existed between the dependent and independent variables. If significant differences were found, an ANOVA and Scheffe post hoc tests were used to further define these differences. For each research question, the seven assumptions of a MANOVA were considered. A MANOVA should satisfy the following assumptions to provide valid results (Hair, Black, Babin, & Anderson, 2014):

1. Independence of observations. To reach this assumption, each participant was located in only one group, with no participants in multiple groups for each MANOVA.
2. Adequate sample size. To reach this assumption, over 50% of the population was used in the study.
3. No univariate or multivariate outliers. To reach this assumption, univariate outliers were identified using boxplots. A boxplot is a graphical display that shows the median and quartiles as a box, and shows more extreme values as highlighted points outside the box (Trochim & Donnelly, 2008). Multivariate outliers were identified using a Mahalonobis distance test. A Mahalonobis distance test can identify multivariate outliers by assigning a 'distance' to each value, that is then compared to an acceptable distance (McLachlan, 1992). Values with a larger distance are considered outliers.
4. Multivariate normality. To reach this assumption, normality was assessed and addressed for each group of the independent variables in relationship to the dependent variables using a Shapiro-Wilk Test. The Shapiro-Wilk Test can identify non-normal distributions if the significance of the test is $p<.05$ (Razali & Wah, 2011).
5. Linear relationship. To reach this assumption, scatterplots were used to examine the linear relationship between variables. A scatterplot is a graphical representation of data points based on two variables using a X and Y axis. A linear relationship is established if the data points form a 'line' within the scatterplot (Utts, 2005).
6. Homogeneity of variance-covariance matrices. To reach this assumption, a Box's M test of equality of covariance was used.
7. No multicollinearity. To reach this assumption, correlations were assessed between the dependent variables.

Assumption 1 was addressed in the study by making each unique participant a member of

only one group. Assumption 2 was addressed by including a majority of the population in the study. Assumptions 3, 4, and 5 were described within each variable. Assumption 3 was assumption 7 is described below, and assumption 6 is addressed within the research question results.

Motivational Measures

Attention: Scores for Attention were compiled from the average score for questions 1, 4 (reversed), 10, 15, 21, 24, 26 (reversed), and 29. The mean score for all participants in Attention was .97, with a standard deviation of .473.

Relevance: Scores for Relevance were compiled from the average score for questions 2, 5, 8 (reversed), 13, 20, 22, 23, 25 (reversed), and 28. The mean score for all participants in Relevance was 1.60, with a standard deviation of .436.

Confidence: Scores for Confidence were compiled from the average score for questions 3, 6 (reversed), 9, 11 (reversed), 17 (reversed), 27, 30, and 34. The mean score for all participants in Confidence is 1.67, with a standard deviation of .437.

Satisfaction: Scores for Satisfaction were compiled from the average score for questions 7(reversed), 12, 14, 16, 18, 19, 31(reversed), 32, and 33. The mean score for all participants in Satisfaction is 1.34, with a standard deviation of .463.

Overall: The overall score consisted of the average of all scores within the Course Interest Survey. The mean score for all participants overall is 1.40, with a standard deviation of .372.

A bivariate analysis was conducted on the four dependent variables of Attention, Relevance, Confidence, and Satisfaction in order to address possible concerns of multicolinearity. A bivariate analysis analyzes two variables to identify the possible relationship between the variables (Babbie, 2009). All correlations analyzed displayed a moderate correlation between variables, suggesting no multicollinearity.

There was no multicolinearity between Attention and Relevance, as assessed by Pearson correlation ($r=.644$, $p < .05$).

There was no multicolinearity between Attention and Confidence, as assessed by Pearson correlation ($r=.276$, $p <.05$).

There was no multicolinearity between Attention and Satisfaction, as assessed by Pearson correlation ($r=.631$, $p<.05$).

There was no multicolinearity between Relevance and Confidence, as assessed by Pearson correlation ($r=.444$, $p<.05$).

There was no multicolinearity between Relevance and Satisfaction, as assessed by Pearson correlation ($r=.689$, $p<.05$).

There was no multicolinearity between Confidence and Satisfaction, as assessed by Pearson correlation ($r=.682$, $p<.05$).

Non-Performance Characteristics

Age: Participants ranged in age from 18 to 50, with 17.6% age 18, 40.4% age 19, 24% age 20, 14% age 22, 2.2% age 23, .7% age 24, .7% age 25, .7% age 27, and .7% age 50. Three participants did not report their age. The average age based upon 133 values, was 19.84 with a standard deviation of 3.015. The data values of age were divided into 5 groups, age 18, 19, 20, 21, and 22+ for preparation for statistical analysis.

Gender: The participants were 42.6% male, 47.8% female, and 9.6% unknown. Participants were grouped into 3 groups (Male, Female, Unknown) for statistical analysis

Academic Rank: Participants in the study were 47.1% Freshmen, 30.1% Sophomores, 11.8% Juniors, 6.6% Seniors, and 2.2% Other. Other was removed from the study as 'other' contained a very small group of participants and was not a category of investigation for the study. Participants were grouped as reported, based upon rank.

Race/Ethnicity: The participants were 81.6% White/Caucasian, 3.7% Hispanic or Latino, 3.7% Black or African American, 2.2% Asian, 1.5% American Indian or Alaska Native, .7% Native Hawaiian or Other Pacific Islander, and 6.6% chose not to disclose a race/ethnicity. Participants were grouped as reported.

Pre-course Performance Characteristics

ACT Score: ACT scores were provided for the study by the university with permission from the participants. The average ACT score for 114 of 136 participants was 21.85, with a standard deviation of 3.58. Participants were grouped by ACT scores in groups 15 and below, 16-17, 18-19, 20-21, 22-23, 24-25, 26-27, 28-29, and 30 and above.

High School GPA: High School GPA was provided for the study by the university with permission from the participants. The average high school GPA for 105 of 136 participants was 3.40, with a standard deviation of .486. Participants were grouped by high school GPA in groups, 2.25 and below, 2.26-2.5, 2.51-2.75, 2.76-3.00, 3.01-3.25, 3.26-3.5, 3.51-3.75, and 3.76-4.00.

ALTSA Pretest Scores: Participants completed the ATLSA pretest at the beginning of the blended digital literacy course. These scores were obtained from the Instructor of the course with permission from the participants. The average pretest score of 131 of 136 participants was 71.95, with a standard deviation of 11.694. Participants were grouped by pretest ALTSA scores into groups 50 and lower, 51-55, 56-60, 61-65, 66-70, 71-75, 76-80, 81-85, 86-90, 91-95, 96-100.

Post-course Performance Characteristics

ALTSA Posttest Scores: Participants completed the ALTSA posttest at the end of the blended digital literacy course. These scores were obtained from the Instructor of the course with permission from the participants. The average pretest score of 125 of 136 participants was 78.75, with a standard deviation of 9.059. Participants were grouped by the same groups as pretest ALTSA scores for analysis.

Change in Digital Literacy Scores: The change in digital literacy was calculated by subtracting the posttest ALTSA score from the pretest ALTSA score. This value gives the overall improvement or decline of a participant after completing the blended digital literacy course. The average change in digital literacy of 121 of 136 participants was 6.64, with a standard deviation of 9.392. Participants were grouped by the change in ALTSA scores into groups -10 and below, 9.99 to 0.00, 0.01 to 10, 10.01 to 20, and 20.01 and above.

RESULTS

Research Question 1: Do statistically significant relationships exist between non-performance student characteristics (age, gender, academic rank, race/ethnicity) and

Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course?

Ho 1.1. There are no statistically significant differences between student age and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

A one-way multivariate analysis of variance was conducted to determine the relationship of on-campus student age and motivational scores of Attention, Relevance, Confidence, and Satisfaction on the Keller ARCS Course Interest Survey. Preliminary assumption checking revealed that Attention, Relevance, and Confidence were normally distributed, as assessed by Shapiro-Wilk test (p>.05). Satisfaction was found to contain two univariate outliers, as assessed by boxplots, that remained in the study. A Mahalonobis distance (p>.001) found no multivariate outliers. Linear relationships were confirmed among dependent variables by age group, as assessed by scatterplot. No multicollinearity existed between dependent variables, and there was homogeneity of variance-covariance matrices, as assessed by Box's M test (p=.339). The differences between age groups and the combined dependent variables was not statistically significant, F(16, 512) = .696, p < .05; Wilks' Lambda = .917; partial Eta Squared = .021. The null hypothesis Ho 1.1 was not rejected.

Ho 1.2. There are no statistically significant differences between student gender and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

A one-way multivariate analysis of variance was conducted to determine the relationship of on-campus student gender and motivational scores of Attention, Relevance, Confidence, and Satisfaction on the Keller ARCS Course Interest Survey. Preliminary assumption checking revealed that Attention, Relevance, Confidence, and Satisfaction were normally distributed for unknown gender, as assessed by Shapiro-Wilk test (p>.05). Attention, Confidence, and Satisfaction were normally distributed for male gender, as assessed by Shapiro-Wilk test (p>.05). After removal of a multivariate outlier, Satisfaction was normally distributed for female gender, as assessed by Shapiro-Wilk test (p>.05). No univariate outliers were found, as assessed by boxplot. A Mahalonobis distance (p>.001) found one multivariate outlier that was removed from the gender study. Linear relationships were confirmed among dependent variables by gender, as assessed by scatterplot. No multicollinearity existed between dependent variables, and there was homogeneity of variance-covariance matrices, as assessed by Box's M test (p=.543). The differences between gender and the combined dependent variables was not statistically significant, F(8, 258) = 1.094, p < .05; Wilks' Lambda = .935; partial Eta Squared = .033. The null hypothesis Ho 1.2 was not rejected.

Ho 1.3. There are no statistically significant differences between student academic rank and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

A one-way multivariate analysis of variance was conducted to determine the relationship of on-campus student academic rank and

motivational scores of Attention, Relevance, Confidence, and Satisfaction on the Keller ARCS Course Interest Survey. Preliminary assumption checking revealed that Attention, Relevance, and Satisfaction were not normally distributed for freshmen, and Satisfaction was not normally distributed for Seniors, as assessed by Shapiro-Wilk test (p>.05). Univariate outliers were identified with boxplots, and remained in the study as they were within two standard deviations of the overall means. A Mahalonobis distance (p>.001) found one multivariate outlier that was removed from the academic rank study. Linear relationships were confirmed among dependent variables by academic rank except "Other", as assessed by scatterplot. "Other" was removed from the study due to lack of a linear relationship. No multicollinearity existed between dependent variables, and there was homogeneity of variance-covariance matrices, as assessed by Box's M test (p=.323). The differences between academic rank and the combined dependent variables was statistically significant, F(12, 323.073) = 2.426, p < .05; Wilks' Lambda = .796; partial Eta Squared = .033. Follow-up ANOVAS showed that Confidence was statistically significant (F(3, 125) = 3.899; p<.05; partial Eta Squared = .086). A Scheffe post hoc test showed that for Confidence, Seniors had statistically higher mean scores (.4799) than Freshmen (p<.05). The Ho 1.3 null hypothesis was rejected.

Ho 1.4. There are no statistically significant differences between student race/ethnicity and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

A one-way multivariate analysis of variance was conducted to determine the effect of on-campus student race/ethnicity and motivational scores of Attention, Relevance, Confidence, and Satisfaction on the Keller ARCS Course Interest Survey. Preliminary assumption checking revealed that Attention, Relevance, and Satisfaction were not normally distributed for white/Caucasian, and Confidence for 'choose not to disclose', as assessed by Shapiro-Wilk test (p>.05). Confidence and Satisfaction were found to contain two univariate outliers in the 'choose not to disclose' group, as assessed by boxplot. The outlier was removed from Confidence while the outlier in Satisfaction remained in the study due to being within two standard deviations of the population. A Mahalonobis distance (p>.001) found one multivariate outlier. The outlier was removed. Linear relationships were confirmed among dependent variables by race/ethnicity group except American Indian or Alaska native and Asian, as assessed by scatterplot. These two groups were removed due to low sample size and no linear relationship. No multicollinearity existed between dependent variables, and there was homogeneity of variance-covariance matrices, as assessed by Box's M test (p=.043). The differences between race/ethnicity groups and the combined dependent variables was not statistically significant, F(12, 320.427) = .857, p < .05; Wilks' Lambda = .920; partial Eta Squared = .027. The null hypothesis Ho 1.1 was not rejected.

Research Question 2: Do statistically significant relationships exist between pre-course performance student characteristics (pre-course digital literacy, high school GPA, ACT score) and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course?

Ho 2.1. There are no statistically significant differences between student pre-course digital literacy and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

A one-way multivariate analysis of variance was conducted to determine the relationship of on-campus ALTSA pretest scores and motivational scores of Attention, Relevance, Confidence, and Satisfaction on the Keller ARCS Course Interest Survey. Preliminary assumption checking revealed that Relevance, Confidence, and Satisfaction were not normally distributed in some groups, as assessed by Shapiro-Wilk test ($p>.05$). A total of five univariate outliers were found, as assessed by boxplot. Three outliers were removed as they were more than two standard deviations from the mean of the respective area. A Mahalonobis distance ($p>.001$) found no multivariate outliers. Linear relationships were confirmed, as assessed by scatterplot. No multicollinearity existed between dependent variables, and there was homogeneity of variance-covariance matrices, as assessed by Box's M test ($p=.179$). The differences between ALTSA pretest scores and the dependent variables was not statistically significant, $F(36, 391.473) = 1.253$, $p < .05$; Wilks' Lambda = .665; partial Eta Squared = .097. The null hypothesis Ho 2.1 was not rejected.

Ho 2.2. There are no statistically significant differences between student high school GPAs and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

A one-way multivariate analysis of variance was conducted to determine the relationship of on-campus student high school GPAs and scores of Attention, Relevance, Confidence, and Satisfaction on the Keller ARCS Course Interest Survey. Preliminary assumption checking revealed that Relevance, Confidence, and Satisfaction were not normally distributed in some groups, as assessed by Shapiro-Wilk test ($p>.05$). One univariate outlier was found in Confidence group 3.01 – 3.25 and removed. A Mahalonobis distance ($p>.001$) found no multivariate outliers. Linear relationships were confirmed, as assessed by scatterplot. No multicollinearity existed between dependent variables, and there was homogeneity of variance-covariance matrices, as assessed by Box's M test ($p=.010$). The differences between High School GPA and the dependent variables was not statistically significant, $F(28, 336.738) = 1.320$, $p < .05$; Wilks' Lambda = .687; partial Eta Squared = .090. The null hypothesis Ho 2.2 was not rejected.

Ho 2.3. There are no statistically significant differences between student ACT scores and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

A one-way multivariate analysis of variance was conducted to determine the relationship of on-campus student ACT scores and motivational scores of Attention, Relevance, Confidence, and Satisfaction on the Keller ARCS Course Interest Survey. Preliminary assumption checking revealed that Relevance, Confidence, and Satisfaction were not normally distributed in some groups, as assessed by Shapiro-Wilk test ($p>.05$). One univariate outlier was found in Relevance, as assessed by boxplot, and

removed. A Mahalonobis distance (p>.001) found no multivariate outliers. Linear relationships were confirmed, as assessed by scatterplot. No multicollinearity existed between dependent variables, and there was homogeneity of variance-covariance matrices, as assessed by Box's M test (p=.167). The differences between ACT scores and the dependent variables was not statistically significant, F(32, 455.197) = 1.097, p < .05; Wilks' Lambda = .760; partial Eta Squared = .066. The null hypothesis Ho 2.3 was not rejected.

Research Question 3: Do statistically significant relationships exist between of post-course performance student characteristics (post-course digital literacy, change in digital literacy) and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course?

Ho 3.1. There are no statistically significant differences between student post-course digital literacy and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

A one-way multivariate analysis of variance was conducted to determine the relationship of ALTSA posttest scores and motivational scores of Attention, Relevance, Confidence, and Satisfaction on the Keller ARCS Course Interest Survey. Preliminary assumption checking revealed that Relevance, Confidence, and Satisfaction were not normally distributed in some groups, as assessed by Shapiro-Wilk test (p>.05). Some Three univariate outliers were found, as assessed by boxplot. The three outliers were removed. A Mahalonobis distance (p>.001) found no multivariate outliers. Linear relationships were confirmed among dependent variables, as assessed by scatterplot. No multicollinearity existed between dependent variables, and there was homogeneity of variance-covariance matrices, as assessed by Box's M test (p=.004). The differences between ALTSA posttest scores and the dependent variables was not statistically significant, F(32, 414.631) = 1.133, p < .05; Wilks' Lambda = .734; partial Eta Squared = .074. The null hypothesis Ho 3.1 was not rejected.

Ho 3.2. There are no statistically significant differences between student change in digital literacy and Keller ARCS Course Interest Survey scores for Attention, Relevance, Confidence, and Satisfaction in a blended digital literacy course.

A one-way multivariate analysis of variance was conducted to determine the relationship of the change in ALTSA pretest and posttest scores and motivational scores of Attention, Relevance, Confidence, and Satisfaction on the Keller ARCS Course Interest Survey. Preliminary assumption checking revealed that Confidence was not normally distributed in one group, as assessed by Shapiro-Wilk test (p>.05). No outliers were identified, as assessed by boxplot. A Mahalonobis distance (p>.001) found no multivariate outliers. Linear relationships were confirmed among dependent variables, as assessed by scatterplot. No multicollinearity existed between dependent variables, and there was homogeneity of variance-covariance matrices, as assessed by Box's M test (p=.589). The differences between changes in digital literacy and the dependent variables was not statistically significant, F(16, 345.858) = .914, p < .05; Wilks' Lambda = .882; partial Eta Squared = .031. The null hypothesis Ho 3.2 was not rejected.

DISCUSSION

Research Question One

Research question one focused on non-performance student characteristics. These characteristics included age, gender, academic rank, and race/ethnicity. These characteristics were described as 'non-performance' to indicate that the measures obtained were not based upon performance.

Age was found to not have a significant relationship with the Keller ARCS Motivation Model Categories, Attention, Relevance, Confidence, and Satisfaction. While the participants ranged in age from 18 to 50, 97% of the participants reported an age of 23 or under, and the average age was 19.84. At the research setting, the student population is reported to have an average age of 24 (Fort Hays State University College Portrait, 2014). The lower mean age of 19.84 in the study is consistent with the research setting. An introductory, freshmen level course is likely to have a lower mean age than a higher level course.

Gender was found to not have a significant relationship with the Keller ARCS Motivation Model Categories of Attention, Relevance, Confidence, and Satisfaction. The participants in the study reported 42.6% male, 47.8% female, and 9.6% unknown/other. At the research setting, the entire student population was reported as 41% male, and 59% female (Fort Hays State University College Portrait, 2014). The results of the study are fairly consistent, but have a lower reported percentage of females.

Academic rank was found to not have a significant relationship with the Keller ARCS Motivation Model Categories of Attention, Relevance, and Satisfaction. A significant relationship was found between academic rank and Confidence ($F(3,125) = 3.899$; $p<.05$; partial Eta Squared = .086). A Scheffe post hoc test resulted in Seniors having statistically higher Confidence mean scores (.4799) than Freshmen. The higher Confidence score for Seniors may be attributed to Seniors having more experience in the university system compared to Freshmen. Confidence is typically created through the use of learning requirements, success opportunities, and personal control (Keller, 2010). Seniors, by nature, will have had more success opportunities and experience with learning requirements and personal control. The participants in the study were 47.1% Freshmen, 30.1% Sophomores, 11.8% Juniors, 6.6% Seniors, and 2.2% Other. Academic Rank data was not available from the research setting. However, with nearly 50% of the participants classified as Freshmen, and the other ranks decreasing in percentage for each rank, this level of freshmen participants seems consistent to general expectations of a freshman-level course.

Race/ethnicity was found to not have a significant relationship with the Keller ARCS Motivation Model Categories, Attention, Relevance, Confidence, and Satisfaction. Participants of the study reported race/ethnicity as 81.6% White/Caucasian, 3.7% Hispanic or Latino, 3.7% Black or African American, 1.5% American Indian or Alaska Native, 0.7% Native Hawaiian or Other Pacific Islander, and 6.6% chose not to disclose a race/ethnicity. At the research setting, the undergraduate population was reported as 56% White, 5% Hispanic, 4% African American, 1% Asian, and 31% international (Fort Hays State University College Portrait, 2014). The participants of the study contained a higher population of White/Caucasian students compared to the research setting. However, at the research

setting 31% were reported as "international" race, which could be any race and change the proportions of race. When comparing the university students to the study participants for all other categories besides White/Caucasian, the numbers are consistent.

When comparing all the non-performance student characteristics of participants with those of the university, the population of the blended digital literacy course was similar to that of the research setting's overall population. This suggested that the participants of the study were possibly representative of the overall student body.

Research Question Two

Research question two focused on pre-course performance student characteristics. These characteristics included pre-course digital literacy, high school GPA, and ACT score. These characteristics were described as 'pre-course' to indicate that the measures obtained were based upon performance measures that were measured before the actual course was administered.
Pre-course digital literacy was found to not have a significant relationship with the Keller ARCS Motivation Model Categories, Attention, Relevance, Confidence, and Satisfaction. Pre-course digital literacy was determined by the Atomic Learning Technology Skills Assessment (ALTSA), a standardized exam based upon the ISTE NETS standards. The average score for 131 of the 136 participants was 71.95%, with a standard deviation of 11.694. No comparison data was available to the researcher in order to compare to previous semesters, national averages, etc.

High school GPA was found to not have a significant relationship with the Keller ARCS Motivation Model Categories, Attention, Relevance, Confidence, and Satisfaction. High school GPA data for the participants was provided by the research setting for 105 of the 136 participants. The average high school GPA for the 105 participants was 3.40 with a standard deviation of .486. Over 68.3% of participants had a high school GPA above 3.0. No comparison data was available to the researcher to compare participants to the overall student population of the research setting. However, the Nation's Report Card: America's High School Graduates reported the national high school GPA of graduates as 3.0 (Nord, Roey, Perkins, Lyons, Lemanski, & Schuknecht, 2011). The increase of participant high school GPA as compared to the 2011 average may be due to the high school GPA inflation of graduates discussed in the Nation's Report Card.

ACT scores were found to not have a significant relationship with the Keller ARCS Motivation Model Categories, Attention, Relevance, Confidence, and Satisfaction. ACT score data for the participants was provided by the research setting for 114 of the 136 participants. The average ACT score for the 114 participants was 21.85 with a standard deviation of 3.58. Over 47.4% of participants had an ACT score higher than 21. No comparison data was available to the researcher to compare participants to the overall student population of the research setting. However, according to the ACT website, the national composite ACT score average in 2013 was 20.9 (ACT, 2013). The participants in the study had a slightly higher (.95) ACT score average than the national average.

Research Question Three

Research question three focused on post-course performance student characteristics. These characteristics included post-course

digital literacy and change in digital literacy. These characteristics were described as 'post-course' to indicate that the measures obtained were based upon performance measures that were measured after the actual course was administered.

Post-course digital literacy was found to not have a significant relationship with the Keller ARCS Motivation Model Categories, Attention, Relevance, Confidence, and Satisfaction. The post-course digital literacy measure was obtained by re-administering the Atomic Learning Technology Skills Assessment (ALTSA) at the end of the course. The average posttest score for 125 of the 136 participants was 78.75 with a standard deviation of 9.059. No comparison data was available to the researcher in order to compare to previous semesters, national averages, etc.

Change in digital literacy was found to not have a significant relationship with the Keller ARCS Motivation Model Categories, Attention, Relevance, and Satisfaction. Change in digital literacy was a calculated measure, obtained by subtracting pretest scores from posttest scores on the ALTSA assessment. This measure was available for 121 of 136 participants, as not all participants completed both exams. The average change in digital literacy was 6.64 with a standard deviation of 9.392. This suggests that a small increase in digital literacy was obtained, on average, for participants in the course. However, this increase was not significant to the motivational categories measured by the Course Interest Survey. The increase may have occurred to testing, or the possibility of scoring higher on a repeated exam (Creswell, 2009). Testing is typically minimized with a significant length of time between exams. Due to the length of time (approximately one semester) between testing dates, 'testing' as a threat to internal validity is likely to not have occurred.

Keller ARCS Motivation Model Course Interest Survey Scores

The overall motivational score consisted of the average of all scores on the Course Interest Survey (CIS). The mean overall score on the CIS was 1.4. The CIS maximum score in this study is 3, and the minimum score is a 0. The standard deviation was .372. The survey consisted of 4 responses (Strongly Disagree to Strongly Agree), with a score of 0 representing no motivation, and a score of 3 representing maximum motivation. The mean score of 1.4 falls almost exactly in the middle, suggesting a mixture of motivation and non-motivation. However, the overall score can be greatly affected by Attention, the most important category, as without Attention the other categories can be 'lost' to participants. Attention is first needed before the other categories of motivation can be realized (Keller, 2010). The survey was further divided into the separate categories of Attention, Relevance, Confidence, and Satisfaction.

Attention scores were compiled from the average score on 8 attention-based questions. The average score for participants in Attention was .97 with a standard deviation of .473. This score is low, or signifies that participants did not feel Attention was reached at a motivational level. The 'low' score in Attention signifies that the scores in the other categories may not be as accurate. When combined with the pre-course digital literacy mean of 71.95 and the small increase in change in digital literacy of 6.64, this suggests that the small increase may be due to students already being familiar with the content of the course

and possibly finding the content non-motivating as it pertains to Attention.

Relevance scores were compiled from the average score on 9 relevance-based questions. The mean score in Relevance was 1.60 with a standard deviation of .436. This score is slightly higher than the overall mean and suggests that the course did provide relevance. Research has shown that digital natives do relate positively to blended learning (Echo360, 2011) and technology (Barton & Skiba, 2006; Koutropolous, 2011) – both present in the learning environment of the study.

Confidence scores were compiled form the average score on 8 confidence-based questions. The mean score in Confidence was 1.67 with a standard deviation of .437. This score is also higher than the overall mean for motivation. This suggests that the course has a clearer layout of requirements, and provides success opportunities for students.

A significance was found between Seniors and Freshmen academic ranks in Confidence. Seniors typically scored higher in Confidence than Freshmen. This is likely due to the experiences and familiarity a Senior would have developed from previously completed courses. These experiences may have developed a better view of what is expected throughout the course for Seniors.

Satisfaction scores were compiled from the average score on 9 satisfaction-based questions. The mean score in Satisfaction was 1.34 with a standard deviation of .463. This score was lower than the mean of the overall score, and suggests that satisfaction was low in the course. A lower score in Satisfaction would suggest that the effort students put into the course may have been not rewarded as expected. Satisfaction can also exist in the form of praise and recognition, which may have not existed in the course, or did not exist to the extent that was expected from the students.

RECOMMENDATIONS

Research Setting

At the research setting, a blended learning course design is used to administer an introductory level digital literacy course. Better understanding of the characteristics of students that are the population of the course may aide in a more effective course that motivates students at an early level of their university academic career. The following are recommendations for the research setting.

Increase Attention: The study showed that the lowest score of all categories in the Course Interest Survey was Attention. Attention is considered the most important of the categories, and all categories can affect each other (Keller, 2010). Attention does pertain to how the content of a course is presented. Motivational strategies to help increase student attention include changes in instruction, such as the inclusion of video, discussions, and team projects. Humor can also be incorporated to break-up the instruction. Real-world examples and discovery learning may also increase student attention. Other items include problem-solving exercises, simulations, games, and group projects. Other data in the study revealed a pre-course digital literacy mean score of 71.95 and a mean increase in digital literacy of 6.64. The content of the course may be ‘on-level’ with the students’ previous knowledge of digital literacy, and the content need revamped or updated to provide opportunity for an increase in digital literacy for students. While some learning is

occurring in the course, presenting the current content in a different manner that grabs attention, or including new content that is more interesting to students may be a more effective approach.

Equip new university students with more Confidence. In the study a significance was found between Seniors and Freshmen in the area of Confidence. Seniors, in general, felt more confident through the course than Freshmen. Confidence pertains to the learning requirements, and although the highest score, Freshmen scored lower than Seniors. Freshmen may want to better understand course structures and how university study works before the course to be more on par with Seniors. A recommendation would be to have Freshmen enroll in a 'university success' course that explains the various learning models and what to expect from university courses before beginning the blended digital literacy course.

Introduce new or revamp existing rewards/praise: Participants of the study reported a lower level of Satisfaction. Satisfaction relates to the reward system in a course, including grades, feedback, etc. As the second lowest score, this signifies that participants did not receive the rewards they were expecting. A recommendation to increase the satisfaction of the course is to review the current grading and feedback process and look for areas of improvement. This may be changing feedback, if applicable, from a perceived negative tone to a perceived positive tone, and implementing a reward/praise system for students.

Explore the blended course model. The current course model utilizes 1 hour of instruction for face-to-face delivery per week. It may be beneficial to review the amount of content that is delivered traditionally versus online. The current percentage of content delivery is between 30% to 79%, but is unknown to the researcher. One of these delivery models may be less motivating to students. By lessening the amount of content delivered through the less motivating model, motivation may be increased.

Examine current 'test-out' procedures. The course in the study may want to offer, if not already available, a test-out exam for the course. Of the participants, 27.4% scored higher than 80 on the pretest of digital literacy. Having a test-out procedure would allow students that already have skills and knowledge of digital literacy to avoid having to participate in what would likely be a non-motivating course. This would also allow more students that would benefit from the course to enroll in the course, or reduce the overall size of the courses to allow more faculty/student interaction. If a test-out procedure currently exists, it may want to be examined or promoted to allow higher digital literacy scoring students an opportunity to bypass the course

Future Studies

While research exists on the blended learning model, little research exists on the relationship of blended learning and student motivation. The following opportunities exist for future investigations:

Incorporate qualitative elements: This study was a quantitative study by design. Qualitative elements could be used in future studies to possibly explore and identify areas of motivation (or the lack of motivation) beyond the capabilities of the Course Interest Survey. The qualitative elements could help explain the scores of the Course

Interest Survey and provide more insight as to why the scores are either higher or lower.

Utilize multiple learning models: The Course Interest Survey used in this study is limited to the Instructor, but it is possible for Instructors to teach in multiple learning models. Examining courses taught by the same Instructor that use a mix of models such as traditional, web-facilitated, blended, and/or online, may provide insight to which learning model is most effective in terms of motivation. Finding a course model that is more motivational than the others may allow for changes in the other learning models.

Use the process in this study on multiple courses: Although the courses can't be compared using Course Interest Survey scores, a course that exhibits higher motivation than other courses can be analyzed by the categories of the Keller ARCS Motivation Model to help identify possible course elements that provide motivation for students. These elements can then be incorporated into other courses and examined to see if they indeed increase the motivation of students in the other courses.

Examine other student characteristics: The characteristics examined in this study were available to and chosen by the researcher, but other characteristics may exist that have a significant relationship to motivation.

Use an alternative scale for measurement: The Course Interest Survey is flexible in design, and allows the researcher to use different scales. This study used a 4-point scale (from Strongly Disagree to Strongly Agree). A scale that provides a larger range, such as a 7-point scale, could allow for a larger range of motivation than what was presented in the study.

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DETERMINING THE EFFECTS OF TUTORING MODALITY ON MIS STUDENT PERFORMANCE, COURSE EVALUATION, AND ATTRITION RATE

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INTRODUCTION

According to the U.S. Department of Education, the demand for online courses has more than doubled in the last decade. Information communication and cloud-based technologies enable higher education institutions to offer college students flexible schedules and access to educational content without time and location constraints (Saba, 2005; Singh & Bernard, 2004).

While advanced technologies present new opportunities for traditional brick-and-mortar higher education institutions to offer online courses, faculty who upload text-based lectures or PowerPoint slides into course management systems, such as Blackboard or Desire to Learn (D2L), may not create multi-sensory e-learning environments to address student learning styles adequately (Alshare, Kwun, & Grandon, 2006; Cheng 2009, 2010, 2011, 2012, 2013; Lessen & Sorensen, 2006). As a result, online courses are often plagued with high attrition rates and low satisfaction with learning (Beaubouef & Mason, 2005; Britt, 2006; Singh & Bernard, 2004; Zhang, 2004).

PURPOSE STATEMENT

To fill the gap in literature, this study examines the impact and effectiveness of online tutoring on students, and seeks to determine if online tutoring has more of an effect on student performance than face-to-face (F2F) classes. By analyzing student performance data, success rate and satisfaction rate, we have a better understanding about which areas of online tutoring work well and which areas need improvement.

LITERATURE REVIEW

The Internet has infiltrated our lives and all aspects of daily activities, including education. Traditional methods of knowledge acquisition and distribution in brick and mortar higher education institutions are enhanced by new online knowledge-based courses that include online tutorials, e-learning and distance learning (Chen, Gupta, & Hoshower, 2006; Picciano, 2006; Santosa, 2015). The Internet, YouTube, Google, and social networks have changed the way today's youth interact and learn both formally and informally.

Opponents of online tutorials believe that in certain situations, students need cues that can only be provided in a classroom setting, such as paralinguistic cues influencing student understanding of course materials (Santosa, 2015). Thus, the lack of F2F interaction between instructors and students may cause loss of attention from students.

Research also shows a positive relationship between student self-regulation and interactivity in an online learning environment (Delen & Liew & Willson, 2014). Students need better self-directed, interactive learning experiences with richer learning environments that contrast with the typical less interactive classroom so that

they can be engaged in the course (Zhang et al., 2006). Educators created a series of online video-based tutorials, also known as eTutors, for their online course modules using software like Camtasia to equalize learning as might be experienced in a F2F class, thus improving student learning and addressing diverse student learning styles (Kuzma, 2010). eTutor cultivates a multisensory learning environment to better address student learning styles and just-in-time assistance for completing project assignments outside of class (Allain & Williams, 2006; Cheng, 2008 & Miller; Cheng, 2009a, 2009b, 2009c, Cheng & Epplin, 2011; Cheng & Swanson, 2011; Cheng, 2012; Cheng, 2013; Cheng, 2014; Waterhouse, 2005). When online tutorials are technologically, contextually, and pedagogically addressed, past research shows that eTutor increases online student learning outcomes by one letter grade when compared to students who used text-based learning materials for the business disciplines of accounting, finance, and management information systems (MIS) (Cheng, 2010, 2011, 2012, & 2014).

TECHNOLOGICAL FRAMEWORK

Global companies, such as IBM, GE, and Motorola, utilize information communication technology (ICT) to deliver web-based training modules to employees acquiring new skills (Huynh, Umesh, & Valacich, 2003; Brown, 2010; Galagan, 2001; Munzer, 2002; Pantazis, 2002; Salopek, 2003; Schank, 2002). Due to recent advances in ICT and artificial intelligence, web-based education systems have become complementary and viable alternatives to traditional classroom teaching (Tekin, 2014). College professors use ICT and learning management systems, such as D2L, to deliver globally accessible course content via cloud-based tutorials to full-time, working students without time and location constraints.

CONTEXTUAL FRAMEWORK

College professors implement computer-assisted instruction, computer-based training, web-based training, or web-based instruction to interact with learners and mediate through ICT by using materials such as readings, assignments, and instructions (Alavi & Leidner, 2001, p.2; Huynh, Umesh, & Valacich, 2003). Educators who create online video-based tutorials cultivate a multisensory learning environment and better address student learning styles (Cheng, 2010, 2012, & 2014; Kuzma, 2010). For the online MIS courses, Table 1 summarizes cloud-based tutorial modules that were developed by a MIS instructor and research assistant prior to the start of this proposed study. By addressing students' auditory, visual, and kinesthetic learning styles, these multimedia-based tutorials, created using Camtasia, provide students with sounds, videos, and hands-on cues, and equalize the online learning experience.

Table 1. Cloud-based Tutorials for Helping Online Students with Microsoft Excel Assignments

Online Tutoring Module #	Assign to	Completed by
#1 How to create formulas in Microsoft Excel?	RA	March 15, 2015
#2 How to use reference figures to calculate data?	RA	March 15, 2015
#3 How to create what if analysis?	RA	March 17, 2015

#4 How to create different types of charts from data?	RA	March 29, 2015

PEDAGOGICAL FRAMEWORK

A primary e-learning advantage is that students "control when and where to learn." Compared to traditional students, online students have higher grade point averages (GPAs), have taken more online courses, spend more time on their courses, expect better performance in their courses, have better technical competencies, and have more positive opinions of e-learning (Holsapple, C., Lee-Post, A., 2006). Cloud-based tutorials allow college professors to tailor learning modules, giving students different ways to learn in a virtual environment based on the learners' technical competency, online experiences, and subject knowledge rather than the one-size-fits-all paradigm for learning material (Benson; Frumkin; Murphy, 2005). Teacher attributes, such as awareness of own thinking, accuracy seeking, open-mindedness, taking a position, and sensitivity to others, influence how faculty and learners interact in online environments (Cheung & Hew 2010).

Learning Style

Students adapt differently to web-based learning, and it is necessary to evaluate student learning styles to assess their e-learning performance (Huang, E., Lin, S., Huang, T., 2012). Different learning styles exist, including auditory, kinesthetic and visual. Providing students with interactive tutorials and instructions through multimedia, enables them to study and learn independently at their own pace with their preferred style of learning.

Ethnicity

A variety of studies on cultural dimensions for online learning have been conducted, including the impact of the learners' cultural demographics on cognitive development and learning outcomes, self-perceptions and learning experiences of cross-cultural learners, and cultural disconnection in the multi-cultural online learning setting (Ke, F., Kwak, D., 2013). Smith and Ayers (2006) conducted case studies of online learning and found that student groups with a high-context culture were disadvantaged in a web-based learning environment designed with a low-context culture. Individualists seem to prefer the web-based, interactive medium of communication while collectivists prefer a face-to-face interaction class environment (Anakwe, U., 1999).

Gender

Gender differences in the online learning process should also be examined. Gender differences may influence student aptitudes while biological and social factors explain the origins of these behavioral and information processing differences (Gonzalez-Gomez, F., Guardiola, J., Rodriguez, O., Montero, M., 2012). Research suggests that male students are more willing to use and learn about computers than female students due to their interest in technology. Students need to exercise control over their learning activities in terms of pace, depth, content coverage, type of media accessed, and time spent on studying, as online learning environments allow students to have more flexibility in their learning activity arrangements (Hung, M., Chou, C., Chen, C., Own, Z. 2010).

Student readiness to adopt e-learning becomes an important aspect when transitioning from the F2F classroom environment. Student maturity may play an important role in their monitoring, managing, controlling, and motivation relative to online learning due to juniors and

seniors exhibiting significantly greater self-efficacy for online learning than freshmen and sophomores. (Hung, M., Chou, C., Chen, C., Own, Z. 2010).

PROJECT METHODS, PROCESSES & PROCEDURES

Research Design

This research utilized an exploratory design, and the data analysis method was mixed. Both qualitative and quantitative data were collected from primary and secondary sources (Table 2). Primary data were derived from a survey and student Microsoft Excel assignment grades. Secondary data included student evaluations and attrition rates. The research proposal, along with an application, was submitted to and approved by the University of Central Oklahoma's Institutional Review Board (IRB) prior to data collection. **The following sections include only primary data analysis.**

Table 2. Data Collection Timeline

Data Collection	Phase	Dissemination
Primary Data	Phase I - Fall 2015	Spring 2016
Secondary Data	Phase II - Spring 2015	Summer 2016

Target & Sample Population

The target population included students who self-enrolled in online Management Information Systems (MIS) courses during the 2015 - 2016 academic year at the University of Central Oklahoma. The target population included two online MIS sections which were taught by the same instructor using the same textbook for the fall semester. One section was a 16-week course while the other section was an 8-week block course. The population included students who voluntarily participated in the proposed study. Participants signed a consent form to comply with IRB requirements prior to data collection.

Instruments & Statistical Procedures

Appendix A provides a copy of the student survey used to collect primary data. Research questions were answered using descriptive statistics.

Research Questions

RQ#1: To what degree do the cloud-based tutorials affect MIS online student performance in relation to learning style?

RQ#2: To what degree do the cloud-based tutorials affect MIS online student performance in relation to ethnicity?

RQ#3: To what degree do the cloud-based tutorials affect MIS online student performance in relation to gender?

RQ#4: To what degree do the cloud-based tutorials affect MIS online student performance in relation to the number of online courses taken?

RQ#5: To what degree do the cloud-based tutorials affect MIS online student performance in relation to student self-reported Microsoft Excel competency?

RQ#6: To what degree do the cloud-based tutorials affect MIS online student performance in relation to classification?

DATA ANALYSIS

The first research question is: **"**To what degree do the cloud-based tutorials affect MIS online student performance in relation to learning style?" Table 3 outlines the findings.

Table 3. Student Performance in Relation to Learning Style

Learning Style	Frequ -ency	Sub total	Aver -age	Med -ian
Auditory	2	191	96	95.5
Kinesthetic	16	1462	91	98.5
Visual	28	2587	92	93.0

The second research question is: **"**To what degree do the cloud-based tutorials affect MIS online student performance in relation to ethnicity?" Table 4 outlines the findings.

Table 4. Student Performance in Relation to Ethnicity

Ethnicity	Frequ -ency	Sub total	Aver -age	Med -ian
African American	3	265	88.3	85
Asian	6	557	92.8	96
Caucasian	27	2462	91.2	98
Hispanic	6	537	89.5	97
Multiracial	2	196	98.0	97
Native American	1	43	43.0	43
Other	2	180	90.0	90

The third research question is: "To what degree do the cloud-based tutorials affect MIS online student performance in relation to gender?" Table 5 outlines the findings.

Table 5. Student Performance in Relation to Gender

Gender	Frequ -ency	Sub total	Aver -age	Med -ian
Female	23	2044.5	88.9	95
Male	24	2195.0	91.5	98

The fourth research question is: **"**To what degree do cloud-based tutorials affect MIS online student performance in relation to the number of online courses taken?" Table 6 outlines the findings.

Table 6. Student Performance in Relation to Number of Online Courses Taken

Online Courses Taken	Frequ -ency	Sub total	Aver -age	Med -ian
0	2	191	95.5	95.5
1	5	452	90.4	99
2	7	610	87.14	85
3	8	750	93.75	95
4+	25	2236.5	89.46	98

The fifth research question is: **"**To what degree does the cloud-based tutorials affect MIS online student performance in relation to student self-reported Microsoft Excel competency?" Table 7 outlines the findings.

Table 7. Student Performance in Relation to Microsoft Excel Competency

Excel Level	Frequ -ency	Sub total	Aver -age	Med -ian
Entry	23	2132	92.69	98
Interme -diate	20	1749.5	87.48	95.5
Advan- ced	3	258	86	83
None	1	100	100	100

The sixth research question is: "To what degree do the cloud-based tutorials affect MIS online student performance in relation to classification?" Table 8 outlines the findings.

Table 8. Student Performance in Relation to Classification

Classification	Frequency	Sub total	Average	Median
Junior	25	2020	80.8	95
Senior	21	1851.5	88.2	96
Sophom-ore	1	100	100	100

Contribution to the Fields of Computer Science and Management Information Systems (MIS)

Research findings provide college faculty and administrators insights on how tutoring modality affects student performance in online MIS courses. Future studies should explore factors affecting MIS student performance in an online environment, such as 24/7 technical support/help desk, faculty online teaching experience, and student self-efficacy (motivation). Exploring these factors can deepen the understanding of institutional, professional, and personal impact on student learning outcomes, satisfaction with learning, and course completion, thus helping educators improve pedagogy by using multimedia and cloud-based technologies to further create effective teaching and learning tools so that online students can succeed in online classes.

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Appendix A
Student Survey

1. My preferred learning style is:
   - Auditory (listening)
   - Visual (seeing)
   - Kinesthetic (hands-on)

2. How many online courses have you taken (UCO + elsewhere)?
   - 0
   - 1
   - 2
   - 3
   - 4 or more

3. What do you consider your competency level with Microsoft Excel?
   - None
   - Entry level
   - Intermediate level
   - Advanced level

4. What do you consider your competency level with Microsoft Access?
   - None
   - Entry level
   - Intermediate level
   - Advanced level

5. What is your gender?
   - Male
   - Female

6. What is your race/ethnicity?
   - African American/Black
   - Asian
   - Caucasian, non-Hispanic
   - Hispanic
   - Native American
   - Multiracial
   - Other

7. Please indicate your classification.
   - Freshman
   - Sophomore
   - Junior
   - Senior

8. What is your major?

   _____

COMMUNITY COLLEGE STUDENTS' TEXTBOOK PREFERENCES: EXAMINING OPEN SOURCE AND E-BOOK INNOVATION IN HIGHER LEARNING

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ABSTRACT

Many factors influence higher education affordability. Rising tuition costs, changes to financial aid qualifications, costs associated with room and board, and textbook costs contribute to increases in higher education expense--which put higher education pursuits out of reach for some. Cost-savings through innovation are increasingly important in order to keep higher education affordable. Making traditional texts available as e-books for purchase or rent is one measure to control rising textbook expenditures for students. Open Education Resources (OER) are materials that are publicly available, most often at no cost, which is certainly a reduction in textbook cost passed on to students. While institutions are adopting these innovations at different rates, there is much to consider about student preferences and experiences related to electronic learning materials as it impacts text adoption, pedagogical best practices by faculty, and implications for learning outcomes beyond student experience. This paper reports findings from a study of the preferences of students from a community college.

INTRODUCTION

More and more students are financially unable to acquire, or deliberately choose to go without course textbooks. A variety of commercial and noncommercial initiatives have been developed to enhance learning success. Faculty are beginning to experiment with freely available and licensed library materials as a substitute for costly commercial textbooks and course packaged textbooks. The results thus far are promising. Some courses can be delivered today using only "freely available" learning resources, some using a mix of fee based and free, while others cannot be delivered using any freely available resources at all due to a lack of availability. (Buczynski, 2006; Caswell, Henson, Jensen, & Wiley, 2008).

E-BOOKS AND OPEN EDUCATION RESOURCES (OERS)

Previous research has demonstrated that the experience of reading e-books is not equivalent to reading textbooks, and might impair the adoption of cost-reducing innovations. When factors influencing preference for e-books as well as reported use of e-book content was examined, it was determined that students do not prefer e-books over textbooks regardless of their gender or computer skill. Participants who had previously used an e-book still preferred print texts for learning. Despite the ability to easily access supplemental content through e-books via hyperlinks and other features, students were more likely to use special features in print books than in e-books. (Woody & Daniel, 2010).

Given the limited understanding of the factors that drive students' attitudes and willingness to use new or innovative devices for learning, a study by Lai (2011) found that usefulness, convenience, compatibility, and perceived enjoyment significantly contribute to dedicated e-textbook acceptance.

In contrast to the type of material that is characterized as commercially distributed text and student learning material, early forms of Open Educational Resources (OER) were defined as, "The open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes" (UNESCO, 2002, p. 43). The term first came to use in 2002 at a conference hosted by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). The most-used definition of OER has been developed to reflect, "Open Educational Resources are digitized materials offered freely and openly for educators, students and self-learners to use and re-use for teaching, learning and research" (Organization for Economic Cooperation and Development, 2007, p. 132). To further clarify this, OER is said to include:

- Learning Content: Full courses, courseware, content modules, learning objects, collections and journals.
- Tools: Software to support the development, use, re-use and delivery of learning content including searching and organization of content, content and learning management systems, content development tools, and on-line learning communities.
- Implementation Resources: Intellectual property licenses to promote open publishing of materials, design principles of best practice, and localization of content. (OECD, 2007, p. 30-31)

Educators and policymakers around the globe are attracted to the promise of OERs to provide equal access and open licensed educational materials for students, teachers, and scholars alike. (Hewlett Foundation Education Program, 2010; Wiley, Green, & Soares, 2012). It is still early days for the OER movement and at the moment it is not possible to give an accurate estimation of the number of on-going OER initiatives, but innovation in this area continues around the world.

RISING COSTS AND THE IMPACT OF INNOVATION

Textbook issues are particularly important in light of considerable debate that has recently transpired concerning the cost of textbooks. In 2005, California Public Interest Research Group (CALPIRG) found that students at California public universities spent about $898 on average in 2004-2005 academic year, and predicted that with a growth rate of 6% per year costs would reach $1,009 in the 2006-2007 academic year and that would make up 6.1% of a four year public university tuition. The report also indicates that students with the opportunity to rent e-books spend less than previous estimates--on average between $130 and $240 *per year* (CALPIRG, 2005). A recent national survey of higher education institutions across the United States indicates students spend an average of $1,122 annually on textbooks and course materials (College Board, 2014).

State and federal lawmakers have identified textbook prices as a significant concern for students, and have sought to legislate solutions to offer relief (Higher Education Act of 2008). Since 2004, at least 34 states have proposed more than 100 bills related to textbook expenses. According to Berry, Cook, Hill, and Stevens (2011), proposed bills have included suggestions such as eliminating state sales tax on textbooks, recommending rental programs, improving the process of financial aid distribution as it affects textbook purchase and providing guidelines for the various textbook stakeholders – students, faculty, colleges, bookstores, and publishers. However, the literature has yet to develop a solid study of cost while considering quality of material or student achievement (Hilton, Wiley, & Bliss,

2012). A deficit of knowledge prevails in helping students determine whether OERs are appropriate for all courses (Hilton, Gaudete, Clark, Robinson, & Wiley, 2013).

METHODOLOGY

A survey about textbook preferences was administered to students at a community college in the eastern portion of the United States. The community college offers both traditional face-to-face instruction, as well as distance learning. The survey instrument contained a combination of Likert-Scale, multiple choice, and yes/no questions which were summarized using frequency distribution and percentages. SPSS was utilized during the data analysis process for cross tabulations for comparison purposes. The survey instrument requested information about student expenditures for class materials as well as student use of e-books, traditional materials, and open education resources. The respondents were also asked to provide information about purchasing habits of materials, device use and preference, implications of financial aid status, and text material purchases.

FINDINGS

Of the 202 respondents to the survey, 114 were male and 88 were female. Thirty-one respondents declared themselves as business majors, and 171 respondents were from other majors. The data analysis included frequency distributions and cross-tabulations. The findings were as follows:

When asked to indicate how much students spent for textbooks in the current semester, students indicated expenditures that were much lower than the average costs cited in the literature. As Table 1 indicates, most (72.2 percent) of the students surveyed are spending less than $450 for textbooks for a semester. Nearly 45 percent of the students report spending less than $300 for a single semester. Utilizing $561 as a national average of what students spend per semester based on the $1,122 annual expenditure figure reported by College Board, students appear to be spending less than average (2014).

TABLE 1 - Student Expenditures

Text Cost Range	Frequency	Percentage
<=$150	31	15
$151-300	59	29
$301-450	56	28
$451-600	40	20
$601-750	9	5
>=$751	7	3
Total	202	100

While findings might suggest that total expenditures are decreasing for a majority of the students, the survey responses indicate that text cost contributes to student perception of higher education affordability. Fifty-seven of the 202 respondents (28.2 percent) indicated the textbook cost would greatly impact their ability to attend an institution of higher learning. (See Table 2).

TABLE 2 - Impact of Text Cost on Affordability

	Student Expenditure	Percentage
Greatly	57	28
Somewhat	72	36
Slightly	44	22
Not at all	29	14
Total	202	100

In response to the question, "Have you ever chosen not to purchase a textbook because of its cost?" 120 respondents answered "no" while 82 of the 202 respondents indicated they have chosen not to purchase course materials because of cost. (See Table 3).

TABLE 3 - Have You Ever Chosen Not to Purchase a Textbook Because of Its Cost?

	Frequency	Percentage
Yes	82	41
No	120	59
Total	202	100

One could reasonably expect to see those students reporting the greatest impact to be at the highest spending levels. However, only 9 students in the $601-750 interval indicated they were greatly impacted by textbook costs, as shown in Table 4. Whereas, 29 of the respondents did not consider the cost of text materials to impact affordability.

TABLE 4 - Cross Tabulation of Expense and Impact on Affordability

	Expense					Total
	<=150	$150-300	$301-450	$451-600	$601-750	
Greatly	6	12	16	14	9	57
Somewhat	10	23	18	15	6	72
Slightly	6	18	16	4	0	44
Not at all	9	6	6	7	1	29
Total	31	59	56	40	16	202

E-BOOKS AND OER

According to Table 5, 93% of respondents indicated satisfactory or higher experience with e-book rental. Since there were only eight unsatisfactory responses, it appears most students who rent are at least satisfied with that experience.

TABLE 5 - Student Satisfaction with e-Book Rental

	Frequency	Percentage
Excellent	16	13
Very Good	42	35
Satisfactory	55	45
Not satisfactory	8	7
TOTAL	121	100

Interestingly, however, while students indicated general satisfaction, only 24 students indicated "yes" they would prefer to have e-books for all their textbooks. Forty one students answered "no" to this question, while 55 students indicated a "maybe/depends on the class" response. (See Table 6).

TABLE 6 - If Possible, Would You Prefer to Have E-Books for All of Your Textbooks?

	Frequency	Percentage
Yes	24	12
No	41	20
Maybe/Depends	55	27
N/A	82	41
Total	202	100

TABLE 7 - What Type of Device do you use to read e-books?

	Frequency
Laptop/Computer	74
Kindle/Nook/other e-reader	12
Phone	31
iPad	16
Other tablet	13

*Multiple responses were given

Students using e-books also indicated that laptops/computers are more often used to read e-books than any other device option provided. While many students possess phones with the capacity to support e-book use, only 31 students responded that they use a phone-type device. Respondents were asked to indicate all devices which applied. (See Table 7).

When asked if students were familiar with Open Source or OERs, 168 students, or 84 percent, answered no, while 33 answered yes. This may indicate that more education about OERs would raise student awareness. It is possible that OERs are in use and students do not distinguish this type of delivery modality from other electronic deliveries, though the non-commercial, and often "free" nature of OERs could have implications for affordability perception if it were better understood.

LIMITATIONS AND FUTURE RESEARCH

This study provided research on a population that has not been the subject of significant focus. The researchers were precluded from making generalizations to a broader population of community college students because this pilot study was limited to one community college, which is geographically located in the eastern part of the country. A larger population of community colleges could be sampled to provide results more reflective of the greater community college environment across the country and include analysis of student demographics.

Also, while this study explores the perceptions, satisfaction, adoption, and cost-savings of students in a community college, there is additional exploration that could be undertaken to evaluate quality of the text material and impact of cost-lowering initiatives on learning outcomes, or the perceptions students have about assurance of learning with electronic materials--OERs or otherwise.

New studies, conducted periodically which evaluate the rate of OER adoption, efficacy in terms of learning achievement, cost-savings, and student satisfaction could prove useful to the developing body of knowledge in this area. Additional studies will be needed to enhance the review of literature for the use of textbooks, e-books, and OER for instructional purposes.

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IDENTIFYING JOB FOCUS AND COURSE PRIORITIES IN IS CURRICULUM DEVELOPMENT USING ONLINE JOB ADVERTISEMENTS

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ABSTRACT

Assuming a goal of undergraduate programs is student placement, courses in an IS curriculum must ensure IS graduates are competent in the fundamental skills that match the needs of the IT job market. As a part of a curriculum revision process, this study examined online Information Technology (IT) job advertisements using content analysis and compared them to the IS 2010 model curriculum. The study found that network administrator, application development, and application support were the top three jobs representing 81% of the available IT jobs. The findings suggest that while softer skills (e.g., communication, problem solving, personal, research, and team) are important elements in a curriculum and account for 24% of the qualifications, technical skills predominate. Those technical skills, viewed from the perspective of the eleven prioritized courses, account for 66% of the qualifications. The other 10% of the qualifications identified in job postings are predominately non-course related items (e.g. education level, experience, etc.). The findings suggest that courses in an IS curriculum must ensure IS graduates are competent in fundamental technical skills that match the IT job market and those courses must integrate the softer skills to ensure that those skills can be effectively brought to bear once the graduate is employed in an organization.

Keywords: IS skills; IS curriculum; IS careersIntroduction

To survive in today's increasingly competitive environment, organizations must assess and change the way that they manage information (Bell, Mills et al. 2013). Graduates from Management Information Systems (MIS)

programs must be able to apply the knowledge and skills they have learned immediately upon graduation when they enter the workplace (Huber and Watson 2013). Therefore, providing organizations with graduates that can demonstrate currently required industry skill sets is of high importance (Bullen, Abraham et al. 2009, Bell, Mills et al. 2013).

This study is intended to enable refinement of an undergraduate Information Systems (IS) curriculum for a metropolitan university in the state of Arkansas, USA. The goal for the curriculum refinement is to ensure that students are prepared for entry into the IS industry by aligning the curriculum with the industry required skills. Therefore, the research questions for this study are:

- What IT jobs currently predominate?
- How are IS courses aligned with the predominate qualifications required by those jobs?

This article proceeds as follows. The next section reviews prior studies on the evolution of IS skills, the history of IS curricula development, and the need for ongoing input from industry. The literature review is followed by a discussion of the methodology used to identify and analyze

jobs and job qualifications. Then after a description of the findings, the findings are analyzed. The study's limitations are then discussed, which are followed by the conclusion.

LITERATURE REVIEW

Studies have been conducted over the last four decades to examine the IS skills required by industry. In the 1970s, studies primarily focused on the importance of technical skills (White 1970). In the 1980s, studies identified an increasing interest in business communication skills, as well as the previously described technical skills (Albin and Otto 1987). In the 1990s, studies described the importance of "soft" skills, those interpersonal, business, and team focused skills, required to perform IS jobs (Richards, Yellen et al. 1998). In the 2000s, studies began to show a bit more diversity in required skills by identifying project management, enterprise resource planning, and security and important required skills (Kim, Hsu et al. 2006). These studies indicate an ongoing evolution in the skills required to perform IS jobs.

Just as the skills required to perform IS jobs continue to evolve, so should the curriculum of undergraduate and graduate programs in academic institutions. In the 1970s, the Association of Computing Machinery (ACM) curriculum committee for computer education for management made undergraduate and graduate curriculum recommendations (Ashenhurst 1972, Couger 1973). Changes to these initial curriculums were recommended in the 1980s (Nunamaker, Couger et al. 1982). The 1990s resulted in the IS 1997 model curriculum (Davis, Gorgone et al. 1997). The 2000s produced two model curriculums the IS 2002 (Gorgone, Davis et al. 2003) and the IS 2010 (Topi, Valacich et al. 2010). The IS 2010 model curriculum is the model currently used in curriculum development. Even though the curriculum continues to evolve, there is almost always a gap between what is required by industry and what is produced by academic programs. There is a long perceived gap between what is produced by academic institutions and what is needed by industry (Trauth, Farwell et al. 1993). This perceived skill gap persists to the present (Kim, Hsu et al. 2006, Eom and Lim 2012). This ongoing skill gap establishes the need for an ongoing review and evolution of academic program curriculum and while the model curriculums provide one input to the process of curriculum development, it is important to enhance the model with input from the practitioner community (Huber and Watson 2013).

METHODOLOGY

One way to gain input from the practitioner community is to review job advertisements used in the recruiting process. This study investigates online job advertisements and compares them to IS 2010 curriculum. First, a content analysis of online job advertisements was performed to identify job types and qualification types. Once completed, the job type and qualification type findings were compared to the IS 2010 model curriculum to identify gaps and overlaps in course offerings.

Content Analysis

Content analysis of online job advertisements was performed. Content analysis is a method of making replicable and valid inferences from text to the text's context (Krippendorff 2004). The goal of content analysis is to provide a numerically based summary of a chosen message set and is appropriate for the summary of any message pool (Neuendorf 2002). The

analysis was performed in three steps: pulled, filtered, and coded. The jobs were first pulled from online job advertising websites. Then the jobs were filtered to remove irrelevant postings. Lastly the jobs and qualifications were coded to enable summarization and inferences.

Online advertised jobs were pulled from four major job posting websites (Dice.com, Indeed.com, LinkedIn.com, and Monster.com). The four websites were chosen based on a ranking of unique monthly visitors using an average from three different web traffic analytics websites: Similarweb.com, Quantcast.com, and Compete.com. Dice received a higher priority because of its focus on information technology jobs. The jobs were pulled based on three criteria: location, posting date, and search term. The location criteria for jobs pulled was set to Arkansas. The posting date criteria of jobs pulled was set to thirty days prior to when pulled on September 18-19, 2015. The final criteria limited jobs pulled by using "Information Technology" as the search term.

The initial job pull resulted over a thousand IT jobs. Many of these jobs were irrelevant to the study due to job miscategorization and non-IT jobs having technology qualification requirements. Correcting the issues from the initial job pull required that the pulled jobs be filtered. Some examples of the jobs removed from the study's dataset included: sales opportunities, entrepreneurial opportunities, etc. After this initial filtering, a convenience sample of 100 jobs was selected for use in this study. The sample of jobs was loaded into a Microsoft Access database for content analysis.

Content analysis was performed by coding Jobs and Qualifications into categories. The coding summarized the jobs and qualifications. Each job was categorized to one and only one Job Type. This coding generalized job sub-specialties such as Java Developer, Web Developer, and .NET Developer among others into a single Application Developer category. The job description and qualifications were used to confirm job type. This resulted one hundred jobs being categorized into ten job types. Each Qualification was categorized to one and only one Qualification Type. The coding of Qualifications also generalized sub-specialties, particularly tool and technology related qualifications, such as C++, Java, PHP, Ruby, and .NET into a Programming Qualification Type. The results of this data coding are presented in the Analysis section of this article.

Curriculum Comparison

The content analysis was compared to IS 2010 model curriculum. Job Types from the analysis were compared to Career Tracks in the IS 2010 curriculum. Also, Qualification Types from the dataset were compared to IS Courses in the IS 2010 curriculum. In some cases a Qualification Type was listed more than once when it could be identified that the Qualification Type encompassed more than one IS Course. The objective of the comparison was to identify overlaps and gaps between the current IS job market and the recommended IS curriculum. The results of this comparison are described in the Analysis section of this article.

FINDINGS

The results of data coding can be summarized in two tables. Fifteen-hundred and twenty-eight qualifications were categorized into twenty-four qualification types. The Qualification Type coding is summarized in order of Qualification count in Table 1. One hundred jobs were

categorized into ten categories, which are summarized in order of Job Count in Table 2.

Table 1: Qualification Types

Qualification Type	Qualification Count	Percent
Networking	266	17%
Programming	236	15%
Project Management	118	8%
Communication	117	8%
Design	100	7%
Personal	92	6%
Database	90	6%
Problem Solving	90	6%
Education	83	5%
Team	64	4%
Requirements	63	4%
Security	35	2%
Package	33	2%
Industry	27	2%
Data Analysis	26	2%
Experience	23	2%
Testing	22	1%
Reporting	13	1%
Mobile	13	1%
Training	6	0%
Business	5	0%
Research	3	0%
Sales	2	0%
Performance	1	0%
Total	**1528**	**100%**

The coded data was compared to the IS 2010 curriculum (Topi, Valacich et al. 2010). The first comparison was between Job Types from the data to the Career Tracks from the IS 2010 curriculum (see Table 3). Seven of the seventeen Career Tracks (41%) matched the Job Type data, but 59% of Career Tracks are not readily apparent in the data. Some of the unmatched Career Tracks are suggested by the data, particularly in the qualifications of some of the other job types, but those Career Tracks are not explicitly identified in the data. Additionally, seventeen percent of the Job Types are not readily apparent in as a Career Track. Again, some of the unmatched Job Types are suggested by the data, but not explicitly identified as a Career Track.

Table 2: Job Types

Job Type	Job Count
Application Developer	54
Network Administrator	14
Application Support	13
Business Analyst	7
Architect / Designer	5
Data Analyst	3
Database Administrator	1
Project Manager	1
Security Administrator	1
Tester	1
Total	**100**

The second level of analysis compared the Qualification Types to the IS Courses provided by the IS 2010 curriculum (see Table 4). Thirteen (72%) of the IS 2010 IS Courses match a Qualification Type, or a subset of a Qualfication Type. This leaves 28%, or five, of the IS Courses that do not match a Qualfication Type. There is a larger mismatch from the Qualification Type perspective as 54%, or 13 of 24, of the Qualification Types are not readily apparent in IS Courses. This mismatch illustrates that 34%, 526 of 1528, qualifications are not readily apparent in IS Courses.

ANALYSIS

Based on the data, there are ten basic job types. Of those ten Job Types, there are three Job Types that account for about 81% of the jobs found in the data. Those jobs are

marked with an "*" in Table 3. These three jobs are an opportunity to focus the local curriculum. The goal of this focus would be to ensure that students will be qualified for those jobs at graduation.

There are thirteen Qualification Types with no matching IS Course (see #1 in Table 4) that account for 34% of Qualifications found in the data (see #3 in Table 4). Education and experience Qualification Types should be removed from the analysis since they are concerned with levels of education (e.g., Bachelor degree or equivalent) and years of experience (e.g., 3-5 years' experience) as those are not curriculum related items. Business and industry Qualification Types should also be removed from the analysis since business functions (e.g., Social enterprise management) and industry expertise (e.g., Healthcare experience is preferred) are contexts that are typically taught outside of a strictly IS curriculum. Communication (e.g., excellent written and verbal communication skills), problem solving (e.g., Problem solving and troubleshooting skills), performance (e.g., tune applications), personal (e.g., Attention to detail), research (e.g., Exceptional research skills), and team (e.g., Team player) Qualification Types need to be considered in the analysis in some way. The training Qualification Type (e.g., Assists in planning, preparation, and conducting seminars on software, hardware, network or other computer related topics) is not considered a gap since it is assumed that training course development and delivery skills would be considered outside the scope of a typical IS curriculum. The mobile Qualification Type (e.g., Familiarity with mobile user-experience best practices) should be considered a gap, but is probably explainable by recognizing that mobile computing is a relatively new trend.

There are five IS Courses with no matching Qualification Types (See #2 in Table 4 for summary view), which include: "Foundations of IS", "Strategy, Management and Acquisition", "Collaborative Computing", "Social Informatics", and "Knowledge Management". The "Foundations of IS" course does not provide specific qualifications to the IS graduates, but it is a course taught across the College of Business to all business majors. The "Strategy, Management, and Acquisition" course is a core IS 2010 curriculum course, but based on this data, it contributes little to qualifications identified with technology jobs. The data also provides little evidence that "Collaborative Computing", "Social Informatics", and "Knowledge Management" courses contribute to qualifications identified with technology jobs.

LIMITATIONS

The study was initiated as a part of a university curriculum revision process in the state of Arkansas, USA. The data collection was limited to the state where university is located. While the findings are appropriate for the university in the IS department's curriculum decision, it limits the generalizability of the findings across the fifty U.S. states. A valuable area for future research would be to replicate the study for more, or larger, geographic regions.

The study is based on data acquired for a single point in time. The small dataset allowed manageable manual manipulations and coding that would not have been possible with a larger dataset without an automated process. Future research should encompass a longitudinal study to monitor changes in required skills over time within the state and the implementation of web

crawlers and text mining tools to facilitate the study of larger datasets.

Lastly, this study investigated the job types and qualification types on which a university IS curriculum should be focused. Future research should use the available data to more fully define the identified courses. For example, there are two-hundred and thirty-six qualifications for the Programming course that can help define the course's objectives, tools, and projects.

CONCLUSION

In conclusion, the study provides insight into available jobs, required skills, and course priorities. The findings suggest that today's IT job market is still predominately technical with 81% of the jobs being network administrator, application development, and application support. The findings suggest that while softer skills (e.g., communication, problem solving, personal, research, and team) are important elements in a curriculum and account for 24% of the qualifications, technical skills predominate. Those technical skills, viewed from the perspective of the eleven prioritized courses, account for 66% of the qualifications. Therefore, assuming a goal of undergraduate programs is student placement, courses in an IS curriculum must ensure IS graduates are competent in fundamental technical skills that match the IT job market and those courses must integrate the softer skills to ensure that those skills can be effectively brought to bear once the graduate is employed in an organization.

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TABLES

Table 1: Job Type to Career Track Mapping

(* identifies top jobs by job count)

Career Track	Job Count	Job Type
Application Developer	54	**Application Developer***
Network Administrator	14	**Network Administrator***
Business Analyst	7	**Business Analyst**
Architect	5	**Architect / Designer**
Security and Risk Manager	1	**Security Administrator**
Database Administrator	1	**Database Administrator**
Project Manager	1	**Project Manager**
	13	**Application Support***
	3	**Data Analyst**
	1	**Tester**
Asset Manager		
Auditing and Compliance Specialist		
Business Process Analyst		
Consultant		
Database Analyst		
e-Business Manager		
ERP Specialist		
Operations Manager		
User Interface Designer		
Web Content Manager		
Total	**100**	

30% (3 of 10) of Job Types are not readily

17% (17 of 100) of Jobs not readily apparent as a Career

59% (10 of 17) of Career Tracks are not readily apparent in Job Types

Table 2: IS Course to Qualification Type Mapping

(symbol + marks Core IS Courses) (symbols * and ** mark duplicates)

IS Courses	Qual Count	Qualification Type
Infrastructure+	266	**Networking**
Application Development	236	**Programming**
Project Management+	118	**Project Management**
Enterprise Architecture+	100	**Design****
Data and Information Management+	90	**Database**
Systems Analysis and Design+	59	**Requirements***
Security and Risk Management	35	**Security**
Enterprise Systems	33	**Package**
Data Mining / Business Intelligence	26	**Data Analysis**
Audit and Controls	22	**Testing**
Information Search and Retrieval	13	**Reporting**
Business Process Management	4	**Requirements***
Human-Computer Interaction	0	**Design****
	117	**Communication**
	92	**Personal**
	90	**Problem Solving**
	83	**Education**
	64	**Team**
	27	**Industry**
	23	**Experience**
	13	**Mobile**
	6	**Training**
	5	**Business**
	3	**Research**
	2	**Sales**
	1	**Performance**
Foundations of IS+		
Strategy, Management, and Acquisition+		
Collaborative Computing		
Social Informatics		
Knowledge Management		
Total	**1528**	

(#1) 54% (13 of 24) of Qualification Types are not

(#3) 34% (526 of 1528) of Qualifications are not readily apparent in IS

(#2) 28% (5 of 18) of IS Courses are not readily apparent

SOCIAL MEDIA COMMUNICATION USAGE PREFERENCES IN HIGHER EDUCATION: DIFFERENCES BASED ON MODE OF LEARNING DELIVERY

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ABSTRACT

Social Media use among the population in general is on the rise. According to the Pew Research Internet Project (2014), 74% of adults use social networking sites. When divided by age groups, 90% of users between the ages of 18 and 29 use social networking sites to communicate with family, friends, or follow their favorite people, places, groups, or communities. How does this apply to the higher education setting? This study analyzes social media usage and perceptions during the Fall 2014 semester for student taking courses in both online and face-to-face environments in an attempt to show if mode of learning influences perceptions.

INTRODUCTION

Higher education has been greatly impacted by the Internet, e-commerce, and social networking. There are multiple reasons why this impact is so prominent in higher education but two of the most important ones are the changes in student population preferences and the changes in delivery media. Students currently entering the higher education classroom in a traditional manner, meaning directly from high school, have been termed Millennials, the Net generation, and digital natives (Emeagwali, 2011; Haag & Cummings, 2010). These students do not know a time without the Internet or technology. In fact, 89 % of these students use the Internet at least once a week, with 34% using the Internet more than once every day (Haag & Cummings, 2010). Much research has been done to determine whether these students expect to see technology used in the higher education classroom and whether they feel mastering technology is important to their future. Most have determined that this generation truly does embrace technology (Smith, 2012).

Research has also stated that students see the university setting as social and they tend to use many different social media tools to communicate with student, faculty, and simply remain in-touch so to speak with what is going on around them (Haddon, 2003; Vrocharidou, Anatoli, & Efthymiou, 2012). The problem that faculty are faced with is, would it benefit the classroom setting to incorporate social media tools in the course curriculum? Students' perceptions on social media tools in general will play a part in answering this question. Thus, the purpose of this study is to analyze perceptions and use of social media tools such as Facebook, Twitter, and Instant Messaging for social and educational purposes among online and face-to-face students in the higher education setting, specifically to determine if perceptions vary based on the method of course delivery, online versus face-to-face.

SOCIAL MEDIA USE

Current research focuses on incorporating social media tools in either the online

environment or the face-to-face environment but rarely addresses both. Brownson (2014) discusses embedding social media tools in online courses and the little effort that it takes to do so. He states that a few links added to an online course can create a more dynamic, interactive learning environment for students that leads to higher student satisfaction (Brownson, 2014). Wei, Chen, and Kinshuk (2012) discussed a common problem in online classroom environments: student isolation. Their research showed that by using social media a faculty member could greatly increase the social presence of an online student. The study highlighted how an increased social presence had significant effects on student learning. Kim, Kwon, and Cho (2011) looks into how social media plays into distance education. Three different studies were conducted to see how social media could be used to bridge the psychological gap many online students feel in "missing out" from the social interaction of a traditional classroom. The study ultimately shows that courses which include a social media component (be it a class discussion, Facebook, or blog) go far to bridge this gap online students feel.

Evans (2014) researched Twitter as an engagement and communication tool for undergraduate Business students in a face-to-face environment. His research, based on a 12-week study, determined Twitter was effective as a communication and engagement tool for the current population of students. He also addressed the fear of some faculty that using a tool such as this to disseminate information would lead to a drop in attendance. It was shown that using Twitter did not effect attendance of students in this case (Evans, 2014).

Piotrowski (2015) addresses Web 2.0 technologies to create a top-notch learning environment for business students in higher education. This study addresses much research reported from many areas on the benefits of incorporating these technologies into curriculum such as the cheap cost, the flexibility of the tools, and the fact these tools offer a dynamic learning environment (Piotrowski, 2015). While it's argued this creates a great learning environment for the students many times faculty concerns are overlooked. Veletsianos, Kimmons, and French (2013) explored social networks from the viewpoint of the instructor. They focused on how social networking can be integrated into an existing courseware application. They stated that instructors have very high expectations of social media and its use in a classroom environment, and are often disappointed by the limitations they find in existing platforms and systems. McEwan (2012) looked at teaching with social media in public sites such as Facebook and private or niche sites (developed for the use of specific groups). Faculty like the idea of having a separate site from their personal one for use in classroom environment and for student-teacher interaction, and closed sites like this provide that (the idea of keeping work as work and a personal life separate). Malesky and Peters (2012) attempted to define a framework of what could be considered appropriate professional behavior for students and professors on social media sites. A survey, responded to by 459 students and 159 faculty members, concluded that student and faculty views on social media are vastly different, with over a third of the students and a quarter of the faculty feeling it was inappropriate for faculty members to even have pages on social media.

Another group of studies have analyzed the perceived ROI of Social Media Integration in the classroom. Wilson (2013) looks at social media from the perspective of

communication. It seems that many students and faculty use social media such as Facebook, Dropbox, OneDrive, Google Drive, and others, however most are not using any of these tools in a collaborative sense. Many faculty and students, for example, have Facebook pages but are not using them in any kind of an education sense. Cao, Aijan, and Hong (2013) applied structural analysis to using social media for educational outcomes. Their numbers showed that faculty used some social media tools, especially those like YouTube to enhance classroom environments. Around 88 percent of the faculty in America had placed at least one video into the LMS (learning management system) for various courses. Schroeder, Minocha, and Schneider (2010) discuss threats and opportunities in using social media (social software) in higher education environments. They looked at twenty different social media initiatives in the United Kingdom, and performed an analysis to determine common strengths and weaknesses in all of them. The general research showed that while social media can widely add to a higher education environment, users must be careful as not everyone has the same level of social media skills.

METHODOLOGY

In the 2014 – 2015 academic year, students in nineteen class sections in the School of Business at a four-year higher education institution were surveyed. The nineteen class sections were divided between ten fully online sections and nine face-to-face sections. Sections had different levels of social media usage and web 2.0 technologies embedded in the class documents and requirements (Facebook feeds, twitter feeds, and interactive apps) as alternative means of communication with the students along with the already existing email and course management system. Students were made aware of the alternative communication media and encouraged to "follow" or sign up; this participation was completely optional. 10 sections were not fitted with the web 2.0 technologies. During the semester, professors in the courses fitted with the web 2.0 technologies used both venues (static and web 2.0) to disseminate course information and announcements to the students. Professors in the other courses (not web 2.0) communicated with students using the traditional methods (course management system announcements, email, discussion boards, etc.).

A survey was developed following the social gratification and gratification opportunity scale by Dimmick, Ramirez, Wang, and Lin (2007) to measure the student's preferences, and social usage of static and web 2.0 technologies. To measure the academic utility of static and web 2.0 technologies, a survey instrument based on the findings of previous research was developed (Dahlstrom et al. 2013; Ellison et al. 2008; Flanagin & Metzger, 2001; Jones 2002). Furthermore, for institutional purposes, a student valuation of the in-house email system and frequency of use were measured.

Different collectors were developed for each one of the different classes included in the study. Each instructor placed the collector in the form of a URL either in the Learning Management System used by the institution (Moodle) or sent the collector directly to the students via email. Survey was open and available for the last 20 days of the semester. Deadlines were added at the discretion of each instructor. Each participant was asked to provide consent as required by IRB. All participants were over 18 years of age.

For the statistical tests completed on this

survey, SPSS was used. A variable differentiating between online and face-to-face sections was created. Certain other variables were recoded into new variables for comparison purposes (to differentiate between non-responses and responses in the negative). This variable was then used in conjunction with variables from the survey in a crosstab. With this crosstab, z-scores were used to compare column proportions and SPSS provided an indicator of significance at the 0.05 level.

RESULTS

A total of 350 responses were received from these nineteen class sections, with 348 responses indicating they agree to be used in the study. Of those 348 responses, 218 were gathered from a student enrolled in an online section with 130 being gathered from student enrolled in a face-to-face sections. These responses may be duplicated as students could be enrolled in multiple sections and answered the survey multiple times. Students could be enrolled exclusively online, exclusively face-to-face, or in a mixture of mode of delivery. A future study may further differentiate between exclusively online and exclusively face-to-face students. However, this study focuses on the differences between students responding from an online section versus a face-to-face section in regards to social media communication preferences.

One of the basic tenets of many statistical analyses is the fact correlation does not equal causation. Thus, the first analysis to be completed for this study is to compare the demographics of the students for each grouping. This comparison can be then used to inform the other results and indicate other possible factors which may cause differences between sections. Table 1 shows the differences between the two groups.

As one can see from Table 1, some significant and interesting differences exist between the students responding from an online section versus those students responding from a face-to-face section. Another study can delve further into some of these differences, but some of the differences are significant (significance tested at the 0.5 level) and should be given consideration as to their effect on the results. As compared to students responding from face-to-face sections, students responding from online sections (1) are significantly older, (2) are significantly more female, (3) have significantly different groupings of GPAs at the higher levels (3.5 and above GPA), (4) have significantly different classification groupings in all areas (except the junior classification), and (5) are significantly more likely to be part-time. Thus, these significant differences in demographics could be an indicator that any differences between social media communication preferences may be attributable to demographics as opposed to mode of delivery. However, with that statement being said, a correlation between mode of delivery and social media communication preference could still be used with the mode of delivery being used as a "placeholder" for an underlying demographic.

As previously stated, this study is concerned with differences in social media communication preferences between a student responding from an online section and a student responding from a face-to-face section. The results provide a foundation to make decisions on how social media can be incorporated in both face-to-face and online sections. Thus, three key questions/areas are considered: general use of social media websites, academic use of social media websites, and preference in regards to use of social media websites in courses.

To provide an overall baseline of usage, students were asked "How do use the following social media networking websites?" As shown in Table 2, students chose from an array of options as well as social media networking websites. Table 2 illustrates the usage of social media networking websites for students responding from face-to-face sections while Table 3 illustrates the same information for students responding from online sections. Chart 1 provides a useful visual representation of the usage (or non-usage) of the various social media websites. One of the interesting takeaways from this chart is the fact while students from online sections are taking a class online, they are as a group using every social media website, except Google Plus, LinkedIn, and Pinterest, less than their peers responding from face-to-face sections. They also check or send e-mail more than their peers responding from face-to-face sections. Interestingly, if one performs a comparison of column proportions on each social media website comparing students who explicitly say they did not use the website versus students who said they did use the website in some way, eight of the social media websites had a significant difference (measured at the .05 level) between students responding from an online section and students responding from a face-to-face section – Twitter, Vine, Instagram, SnapChat, YikYak, LinkedIn, Pinterest, and Tumblr. As previously mentioned, all of these social media websites except LinkedIn and Pinterest are used more by students responding from a face-to-face section.

While the above analysis provides a baseline of usage, further analysis is needed as far as the usage of social media websites for academic purposes. Table 4 shows the usage of certain social media websites for academic purposes for students responding from a face-to-face section while Table 5 shows the same information for students responding from an online section. If one calculates the percentage of students responding who never use the particular social media website, one will again see the percentage of students saying they never use a particular social media website is higher for every option, except Google Plus, LinkedIn, Pinterest, and e-mail. Chart 2 provides a good visual representation of that information. However, while the basic percentages are different, another comparison of column proportions on social media websites between students who say they never use the website for academic purposes responding from face-to-face sections versus students who say they never use the website for academic purposes responding from online sections reveals only one social media website (Instagram) with a significant difference (at the 0.05 level) between the two groups. Thus, for most of the social media websites, no significant difference exists as far as academic usage between students responding from face-to-face sections versus students responding from online sections.

However, this lack of a difference could reflect the actual opportunity to use these social media websites in an academic setting. While some sections implement Web 2.0 technologies, other sections do not implement Web 2.0 technologies. In addition, even in sections which implement Web 2.0 technologies, not all possible social media websites are used. Thus, the preference of students in regards to using social media in courses was analyzed. Chart 3 provides a visual representation of the preference of students in regards to using social media in courses. A final comparison of column proportions on preference for social media usage in courses between students responding from face-to-face courses and students responding from online

courses reveals no significant difference (at the 0.05 level) between the two groups.

DISCUSSION

This study reveals some interesting information regarding differences between students responding from online and face-to-face courses. Comparisons of column proportions were conducted on demographics, general usage of social media websites, academic usage of social media websites, and preference for social media usage in courses.

As previously stated, significant differences exist between the two populations. For example, online students are generally older, more likely to be female, and more likely to be part-time. These demographic differences could explain some of the differences present in some of the other column proportion tests. While these underlying demographics may indeed be the cause of some of the differences, one could still use the results of the survey to make some informed decisions in the use of social media websites in the classroom.

One way to make an informed decision about the use of social media websites in the classroom is to review the use of social media websites in students' general activities. This analysis showed a significant difference in the use of eight social media websites between students responding from online sections and students responding from face-to-face sections. Twitter, Vine, Instagram, SnapChat, YikYak, and Tumblr are all used significantly more by students responding from face-to-face sections. In contrast, LinkedIn and Pinterest are used significantly more by students responding from online sections.

However, general use of a social media website does not mean a student is using the website for academic purposes. When this analysis is completed, only one social media website (Instagram) has a significant difference between the two groups. Furthermore, the final analysis regarding preference of use in the classroom shows no significant difference between the two groups. Thus, while the students may have differences in their underlying demographics as well as their general use of social media website, this study indicates no significant difference in their actual desire to use social media websites in the classroom.

CONCLUSION

In conclusion, this study provides several insights in the difference between students responding from face-to-face sections and students responding from online sections. First, this study corroborates the existing evidence of students having some key underlying demographic differences between the two groups. Secondly, students responding from face-to-face sections seem to use certain social media websites while students responding from online section seem to use different social media websites. Thirdly, in regards to academic use, students from the two groups seem to have the same usage, except for Instagram. Finally, the two groups do not have a significant difference in regards to their preference for use of social media in the academic setting. In conclusion, while this study provides evidence of differences between the two groups and their general usage of social media websites, the study also shows (with one exception) no differences between academic usage of social media websites and preference for usage of social media websites in the academic setting. Thus, based on this study, educational practitioners who wish to use social media websites in the

academic setting can do so with the knowledge no differentiation is generally apparent between the online population and the face-to-face population. However, the educational practitioner should be mindful of the significant differences in general usage and their effects on the skills and access needed for the academic environment.

The usage of social media in the academic environment as well as the differences between students in an online environment and face-to-face environments are current topics in the academic arena which need to be investigated further. Future studies should further delve into one or both of these topics.

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Table 1: Demographic Comparison

	Responses From Face-to-Face Sections (n=130)	Responses From Online Sections (n=218)
Percentage of Students 20 and Under	57.3% (n=124)	7.2% (n=194)
Percentage of Students 25 and Under	87.9% (n=124)	46.9% (n=194)
Percentage of Females	33.9% (n=124)	53.1% (n=194)
Percentage of Students with 3.0 or Higher GPA	68.5% (n=124)	50.5% (n=194)
Percentage of Upperclassmen	45.2% (n=124)	94.3% (n=194)
Percentage of Full-time Students	96.0% (n=124)	77.3% (n=194)

Table 2: Usage of Social Media Networking Websites – Students Responding From Face-to-Face Sections

How do you use the following social media networking websites?															
Answer Options	**Facebook**	**Twitter**	**Vine**	**Instagram**	**SnapChat**	**YikYak**	**Remind**	**Google Plus**	**YouTube**	**LinkedIn**	**Pinterest**	**tumblr**	**Check or send email**	**Don't use**	**Response Count**
Stay in touch with friends and/or family	87%	31%	4%	48%	40%	3%	1%	9%	5%	2%	3%	2%	36%	4%	118
Make new friends I have never met in person	36%	31%	8%	38%	19%	2%	0%	3%	7%	0%	1%	4%	4%	44%	118
As a forum to express my opinions and views	51%	35%	3%	25%	12%	15%	1%	1%	7%	0%	3%	5%	8%	31%	118
Share photos, music, videos, or other work	72%	34%	14%	58%	41%	3%	0%	5%	27%	0%	5%	11%	16%	9%	118
For professional activities (job networking, etc.)	36%	11%	1%	8%	3%	1%	0%	8%	6%	11%	0%	0%	40%	34%	118
Communicate with classmates about course related topics	53%	22%	2%	15%	11%	6%	2%	1%	0%	0%	0%	0%	46%	19%	118
Communicate with instructors about course-related topics	14%	3%	1%	2%	2%	0%	2%	1%	0%	0%	0%	0%	68%	26%	118
Other	23%	9%	8%	11%	11%	7%	2%	5%	21%	1%	6%	3%	14%	57%	118
I don’t use this	3%	27%	42%	24%	21%	43%	58%	45%	17%	51%	48%	51%	5%	43%	118
													answered question		**118**
													skipped question		**12**

Table 3: Usage of Social Media Networking Websites – Students Responding From Online Sections

How do you use the following social media networking websites?															
Answer Options	**Facebook**	**Twitter**	**Vine**	**Instagram**	**SnapChat**	**YikYak**	**Remind**	**Google Plus**	**YouTube**	**LinkedIn**	**Pinterest**	**tumblr**	**Check or send email**	**Don't use**	**Response Count**
Stay in touch with friends and/or family	89%	21%	3%	32%	17%	1%	1%	7%	5%	3%	5%	0%	42%	3%	178
Make new friends I have never met in person	32%	18%	2%	21%	4%	1%	0%	3%	6%	8%	5%	1%	2%	53%	178
As a forum to express my opinions and views	52%	28%	2%	18%	6%	3%	1%	4%	4%	2%	6%	2%	8%	33%	178
Share photos, music, videos, or other work	74%	24%	8%	48%	17%	1%	0%	6%	20%	2%	17%	3%	22%	10%	178
For professional activities (job networking, etc.)	30%	8%	0%	7%	3%	0%	0%	6%	5%	31%	0%	0%	38%	27%	178
Communicate with classmates about course related topics	38%	11%	1%	9%	4%	1%	1%	5%	1%	0%	0%	0%	61%	20%	178
Communicate with instructors about course-related topics	16%	2%	0%	3%	1%	1%	1%	1%	1%	1%	1%	0%	73%	20%	178
Other	22%	9%	2%	8%	4%	3%	1%	5%	21%	3%	8%	1%	21%	54%	178
I don’t use this	6%	37%	52%	33%	48%	61%	62%	46%	20%	38%	40%	59%	5%	36%	178
													answered question		**178**
													skipped question		**40**

Chart 1: Comparison of Social Media Usage Between Online and F2F

How do you use the following social media networking websites?														
Answer Options		**Facebook**	**Twitter**	**Vine**	**Instagram**	**SnapChat**	**YikYak**	**Remind**	**Google Plus**	**YouTube**	**LinkedIn**	**Pinterest**	**tumblr**	**Check or send email**
F2F - Used in Some Way		97%	65%	34%	73%	73%	34%	6%	26%	75%	19%	23%	18%	95%
Online - Used in Some Way		96%	52%	19%	61%	37%	10%	5%	30%	71%	47%	39%	8%	97%
F2F - Not Used		3%	35%	66%	27%	27%	66%	94%	74%	25%	81%	77%	82%	5%
Online - Not Used		4%	48%	81%	39%	63%	90%	95%	70%	29%	53%	61%	92%	3%
F2F n		110	92	76	101	91	77	72	72	72	74	74	73	97
Online n		169	135	114	149	132	119	114	115	114	125	117	113	148

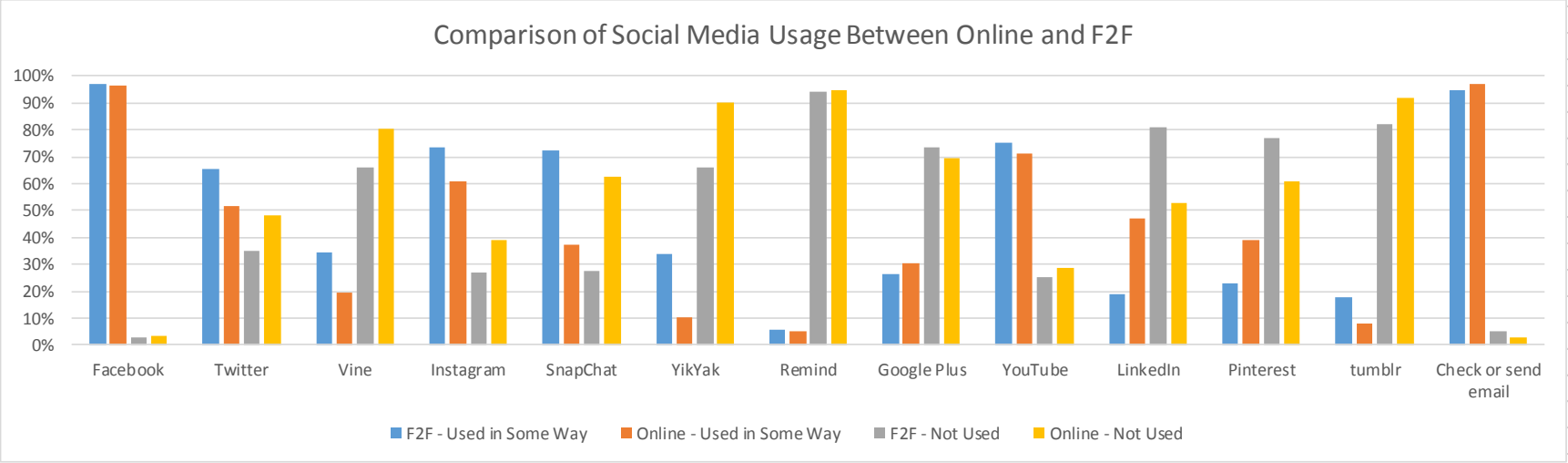

Table 4: Usage of Social Media Networking Websites for Academic Purposes – Students Responding From Face-to-Face Sections

How often do you use the following for academic purposes?								
Answer Options	**Never**	**Once Per Year**	**Once per semester**	**Monthly**	**Weekly**	**Several times per week**	**Daily**	**Response Count**
Facebook	74	5	5	8	13	9	4	118
Twitter	104	1	1	5	4	1	2	118
Vine	114	0	0	2	1	0	1	118
Instagram	104	0	3	4	4	2	1	118
SnapChat	107	0	0	4	4	1	2	118
YikYak	111	1	0	2	1	1	2	118
Remind	110	0	1	3	2	1	1	118
Google Plus	107	0	1	3	4	3	0	118
YouTube	62	3	8	18	11	10	6	118
LinkedIn	111	0	2	3	1	0	1	118
Pinterest	114	1	0	2	1	0	0	118
Tumblr	114	0	0	2	1	1	0	118
Check or send email	25	0	2	2	15	22	52	118
						answered question		**118**
						skipped question		**12**

Table 5: Usage of Social Media Networking Websites for Academic Purposes – Students Responding From Online Sections

How often do you use the following for academic purposes?								
Answer Options	**Never**	**Once Per Year**	**Once per semester**	**Monthly**	**Weekly**	**Several times per week**	**Daily**	**Response Count**
Facebook	115	6	16	17	12	5	7	178
Twitter	166	1	4	3	1	1	2	178
Vine	175	0	1	2	0	0	0	178
Instagram	170	0	1	3	2	2	0	178
SnapChat	170	0	3	1	2	1	1	178
YikYak	173	0	0	4	1	0	0	178
Remind	172	0	1	3	2	0	0	178
Google Plus	159	0	6	3	3	4	3	178
YouTube	104	4	13	26	18	11	2	178
LinkedIn	167	1	2	6	2	0	0	178
Pinterest	170	0	2	6	0	0	0	178
Tumblr	174	0	2	2	0	0	0	178
Check or send email	23	0	0	4	18	36	97	178
						answered question		**178**
						skipped question		**40**

Chart 2: Comparison of Academic Social Media Usage Between Online and F2F

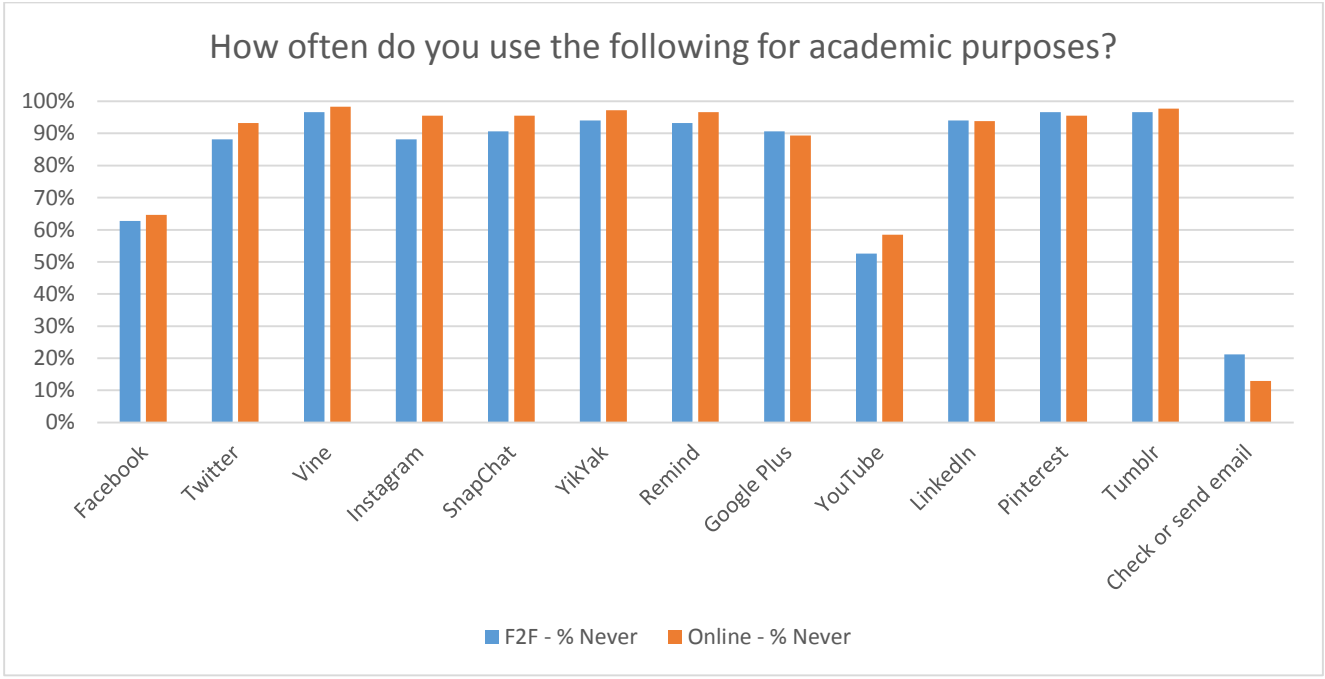

Chart 3: Comparison of Preference for Academic Social Media Usage Between Online and F2F

Which best describes your preference?		
Answer Options	**F2F Percent**	**Online Percent**
I prefer taking courses that use no social media for communication purposes	27.1%	23.6%
I prefer taking courses that use limited social media for communication purposes	28.0%	32.0%
I prefer taking courses that use a moderate level of social media for communication	33.1%	32.0%
I prefer taking courses that use social media for communication purposes extensively	7.6%	10.1%
I prefer taking courses that use social media for communication purposes exclusively	4.2%	2.2%
N	118	178