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## **Journal Profile**

The *Journal of Research in Business Information Systems* (JRBIS) is a national blind-reviewed, refereed publication published annually by the Association of Business Information Systems. This refereed journal includes articles from fields associated with business information systems focusing on theory, problems associated with information systems and information resources in education, business and industry, government, and the professions.

Manuscripts are selected using a blind review process. The first issue of the Journal was available Spring 2008. The Journal is listed in the ERIC Database and Cabell's Directory of Publishing Opportunities in Accounting, Computer Information Systems, Education, Instructional Technology, and Management.

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Submissions should include a separate file attachment for the title page that contains the following information in this exact order:

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- Each author's full name; position/title; institutional affiliation, including address, city, state, zip code; home, office, and cell phone numbers; and e-mail addresses (identify the main author who should receive all correspondence).
- Number of words in the article (including all parts—everything)
- Biographical paragraph (50-60 words) for each author
- Any acknowledgments or information about manuscript history (e.g., based on a conference presentation)

The second separate file attachment should be the manuscript file that begins with the title of the article, a 50-100 word abstract, 3-5 keywords or phrases describing the focus of the article, and the body of the manuscript. **Do not include any personal or institutional affiliation information in this file.**

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- 10-25 double-spaced pages (3,000-6,000 words)
- 1” margins all around
- Times New Roman, 12 pt. font-size text within the article
- Bold and center primary headings, with major words capitalized
- Bold and left-align secondary headings, with major words capitalized
- No footnotes or endnotes
- No page numbers or headers or footers

Tables and figures may have varying font sizes (but must adhere to APA Style). Include tables or figures formatted and placed correctly within the manuscript.

Include the References page at the end of the manuscript, followed by appendix information, if necessary.

All submissions will be reviewed by the editor and at least two reviewers, using a blind review process. Authors will receive feedback 6-8 weeks after the initial peer review. Manuscripts will be “accepted,” “accepted with minor revisions,” “possibly accepted after major revision and resubmission for further peer review,” or “rejected.”

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To ensure your manuscript is considered for publication in the *2022 Journal of Research in Business Information Systems*, submit the manuscript by July 31, 2022, to the JRBIS journal editor.

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# **The Future of Cloud Computing: Implications for Theory and Practice**

Frida Alcocer-Loredo, Texas Woman's University  
Regini Chacko, Texas Woman's University  
Mahesh Raisinghani, Texas Woman's University

## **Abstract**

In 2011, the National Institute for Science & Technology (NIST) brought forth a draft definition of cloud computing, which articulated for service and deployment models. Which then turned into “the main idea [being] that most enterprise applications can run in a time-sharing setup with such bells and whistles as collaboration, reports and guaranteed uptime” (Arnold, 2014). With the many advancements in society, it became clear that large data sets were taxing for new organizations. Despite the differences of knowledge management and cloud computing, organizations saw it as an opportunity to take an offered solution if the outsourcing efficiencies were up to par. Although cloud computing is seen as an advancement, there are notable setbacks that may make an organization, new to the idea, hesitant. According to Trees (2019), “the transition to cloud-based KM has its challenges, including fewer opportunities for customization and the need to reorient users’ mindsets.” However, this roadblock isn’t stopping organizations from evolving and learning about the cloud as they improve on their technological advancements. Likewise, an organization will need to evaluate the effect of quality control and how the development of cloud adoption will affect their organization and data at hand.

As general nature, humans tend to follow the trend of what is the latest known thing to be used at the time. This is no different with cloud computing, as nine out of ten companies have already made this progressive stand. The movement towards cloud adoption is growing over service delivery models and some may have questions over whether or not this movement is

right for them and their organization. While the promise and positive attitude is appreciated, is there a lack of knowledge towards this movement? Are organizations just following the trend, if so, what do they need to look out for? Does cloud adoption have a systemic approach for quality control? In this paper we aim to discuss why organizations are moving from knowledge management to cloud computing and how it will affect future innovation.

## **Introduction**

Knowledge Management is known to originate from the management consulting circle. The thought came when organizations found they needed an in-house group for internet operations. With this group, the organization would be able to make information accessible and disperse it amongst various departments of the organization easily. Soon enough, after much progress in technique and service building the management circle decided to market this new service product to other organizations that had a larger bandwidth. As illustrated in figure 1, these organizations included those that supported applications such as information systems, general management, and public policy so that they are able to map, gather, and filter necessary information. There are three fundamental processes of knowledge management, which include knowledge acquisition, sharing, and utilization, but because it is not a static process the success lies within cloud computing (Aksoy & Algawiaz, 2014). Based on research, the top reason for an organization's motive behind moving to cloud computing is the opportunity to expand access within their enterprise applications. For example, Microsoft has chosen to opt in operations that consider a hybrid outlet. Below in this image (2019), is an outline of how Microsoft plans to integrate cloud computing into their knowledge management. Although there are many models to consider, Microsoft's is a model that organizations should place value on as it illustrates exactly how an organization should take action and where steps should be inclusive of certain cloud based integration. When making these

decisions, it is important to evaluate all aspects and how it may impact certain roles or goals that the organization thrives on. With society moving at a constant high speed, the need for a modern workplace is essential in carrying out actions thoroughly and time effectively. Having this pressure within the IT realm of not only finding a way to do so but making sure that it is cost efficient has been the long part of the journey, but most have come to realize the advantages that cloud computing has to offer. Cloud computing is said to be the more popular option in today's society as it is more cost and time efficient, performance and productivity increased, and secure all while being able to provide service-oriented architecture.

Figure 1

*Framework for Cloud Based KM*



**Fig 1-Framework for Cloud Based KM**

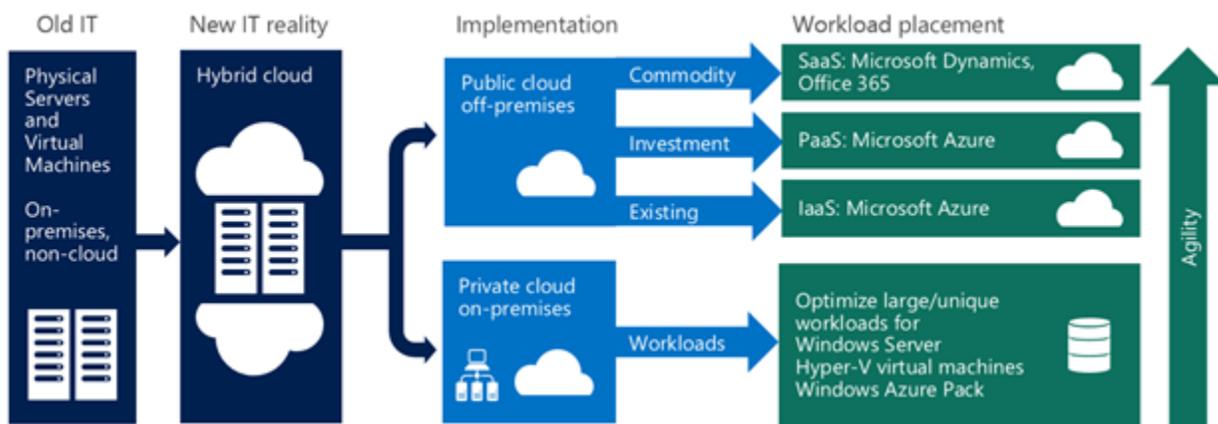
## **Service Delivery of Cloud Computing**

With the growing movement of organizations switching from knowledge management to cloud computing, the applications that make it affluent include infrastructure, platform, software and knowledge. These given applications offer an array of benefits and make for this process of cloud computing more efficient when compared to knowledge management. As illustrated in figure 2, when used appropriately, it will benefit the four deployment models of cloud computing: private cloud, public cloud, hybrid cloud and community cloud. According to Daud & Rahman (2017), each cloud has a particular service and priority to its name. For instance, the private cloud is used for data that is needed to be in a controlled space. Public clouds have a slight sway in control but optimizes in efficiency and cost reduction. The hybrid cloud is when two or more clouds are meshed to serve a particular service and lastly the community cloud is used for shared data amongst several organizations. With the proper use and understanding of these applications and clouds, there will be a great reduction in time constraints or vulnerability that an organization may have in relation to knowledge management. To help further reiterate the advancements that cloud computing has to offer, a framework was presented, which can be seen in Figure 1 (Sadeghzadeh et al., 2014). In this particular framework, there is a detailed explanation as to what makes up each layer that is cloud computing and what is expected to come from it. These layers will be further discussed within this paper, as one continues to delve into how cloud computing works and how it will further help with the process of knowledge-based management and quality control amongst organizations. With this knowledge of the various cloud functions, what actually makes up the applications for the software to be groundbreaking?

Infrastructure as a service (IaaS), is the first basic service model that provides cloud computing provisions. Many cloud frameworks that exist are leveled to the basis of private and public clouds. According to Shahzadi et al. (2017), there are cloud platforms that provide IaaS which include, Nimbus, Eucalyptus, OpenNebula, OpenStack, CloudStack, AbiCloud, and XEN Cloud Platform. In their study, they classify that choosing an appropriate IaaS may be difficult if the organization is unaware of the goals they are wanting to achieve, based on their user requirements. This is vital to inquire about across all departments of an organization so that all needs are met across the board. This will not only give everyone the advantage of sharing their opinions and concerns but will also help outline the ideal needs for administration to make a decision on which platform they are to choose. If an organization were to follow this service model, it would eliminate the cost for an infrastructure.

Figure 2:

*Cloud computing deployment models*



Due to IT services having the ability to subscribe to a Cloud Service Provider, it allows them to have the “pay as you go” option. In addition to this, the subscription will be based from a remote

location and services can be accessed as needed, based on the turnover time of the organization itself. The organization is then able to utilize servers and networks at any location and desired time. To diversify this there is “a software technology called virtualization which consists of physical resources as servers allow IaaS providers to present clients with affordable and practically unlimited instances of servers” (Sadeghzadeh et al., 2014). In addition to this option, organizations will also have the alternative to network virtual machines as needed. The use of IaaS will also eliminate the need for any physical IT resources as organizations will be able to ameliorate their application versions without assistance.

Platform as a Service (PaaS), serves as the next service model that is used to develop customer-created software applications. The PaaS has three stakeholders, the host who provides adequate resources to meet the customer demands, the provider who provides a suitable environment to build applications and the user who needs to be in the accessible range of a browser to seamlessly deploy the applications. In addition to this, the service is done by using tools that are managed within the cloud and able to be utilized with a browser. Sadeghzadeh et al. (2014) states that “this layer is placed on the infrastructure layer's virtual machines.” Since the organization will have the foundation of an IaaS layer, they will be able to maintain and develop these web applications they are curating, with little to no particular competence. With the potential to customize applications, it is imperative that the needs of the organization or goal of a project are defined prior to creation, so that the solution can meet. Although customization can be altered after implementation, it will minimize any prolonged disruptions or delays if the organization is prepared. As preparation is taking place, it is also ideal that the organization is aware of any upfront costs so that they are able to identify where the help is needed, if they are able to handle certain aspects of implementation, and where the vendor will need to take over. In turn, this will increase

the flow of information so that all stones are left unturned. Additionally, “the improved information flow enables deeper insights and a more comprehensive overview for decision makers (Gower, 2019). This will allow for less time constraints and loopholes that the organization may have faced prior to using a PaaS application. Kulkarni, Khatawkar, and Gambhir (2011) resonate on the idea that for an organization to fully benefit this models’ capabilities, staff developers have to adapt their applications in such a way that they are able to react to outside changes and diversions. This may essentially lead to the developer using IaaS and PaaS services from within the application. All in all, PaaS applications have a typical usage towards services such as startups, projects with elevated deadlines, or organizations and projects that have a small expenditure limit.

Software as a Service (SaaS), is the service model that will change the way individuals build, obtain, and use the software. This service model has the upper hand in having a service oriented architecture, which enables software applications to communicate with one another. In the early attempts of this service model there is a notable difference in how users' experience has drastically changed. In the past, the model was aligned to traditional applications with some functionality of SaaS applications and the ability to share data with other applications were limited. However, “today, SaaS applications are expected to take advantage of the benefits of centralization through a single instance, multi-tenant architecture, and to provide a feature rich experience competitive with comparable on-premise applications” (Kulkarni,et al., 2012). This service in particular makes a defining movement in being able to transfer the control from the client domain to the service provider and that there is an economic incentive as well. SaaS is a recurring subscription model that is delivered in the option of “pay as you go” and the infrastructure is able to deliver one application to a variety of users, regardless of their true location. Since the SaaS model is delivered in such a way, the customer does not need to worry about installation of the

software to servers, instead they are able to complete all necessary functions needed through the aptitudes of the developer, which in turn saves the organization cost expenditure. Due to the model having a large priority to supporting user demands at all hours of the day, it has been given the functionality to process a series of transactions in a secure environment (Kondraju, 2014). Applications within this service are ones that are no longer needed to be developed and are cloud based. As mentioned, there are a vast number of opportunities that come along with the use of SaaS. After thinking of the financial and infrastructure standpoints for an organization, how much more can SaaS do? The service has the opportunity to help with the speed of deployment, reduce burden and increase scalability. Deployment is increased due to the advantage of users being able to obtain access quicker to meet their technical needs, than having to wait for an infrastructure to be produced first for this to occur. Instructors are now able to receive approval in less than one day and begin courses that are taught at an 8-9 week speed, in consideration of new technological advances. However, with this new acceleration users are more up to date with advances that are being made and able to do so in a thorough fashion. As for the decrease in burden, since the service allows for low commitment, there is a low demand on technological resources or for an IT department all together. In the event that an organization has older computers for use, hardware upgrades are not seen necessary since SaaS can be used with compatible browsers. Lastly, scalability can be easily altered as needed for the organization. In the past, there would be a period of time needed specifically for license procurement and technical staff to integrate the software, but with SaaS being operated centrally these adjustments can be made instantly. With this quick turnaround it allows for more focus on productivity levels. In this model, the “focus is on sharing, processing, and classifying knowledge along with employee assessment based on cloud technology” (Sadeghzadeh et al., 2014).

Knowledge as a Service (KaaS), is the last service model that is prioritized to access very specific knowledge at any given time. Within this service model, cloud computing is used as a tool to secure and evaluate core competency. By adopting this service, it will further reduce the need for an in-house team and eliminate the possibility for human error. Leading into the idea and value of risk management. For an organization to be able to utilize their given knowledge and rely on risk management, is a vital aspect of keeping an organization whole. Fortunately, “KaaS is a combination of knowledge based processes and organizational systems which enable knowledge management at organizational level” (Sadeghzadeh et al., 2014). There is a prime focus on how an organization can use the knowledge that they already have and where they can improve or benefit from information that is efficient or required. If an organization is worried about knowledge overload, there is no need because this service model provides for quick access to information in a timely manner that is also in relation to, or considerate to, past experience as well. As stated by Barreto et al. (2018), KaaS architecture is made of three components, which are Data Owners who are responsible for documenting data from their daily transactions and protecting such information, Knowledge Service Providers who centralize knowledge through an algorithm based server, and Knowledge Consumers who use the said applications to help with their decision-making processes. In addition to this, Sadeghzadeh and team conducted interviews with senior managers, which “concluded that customer experience analysis, knowledge-rich articles research, various multimedia, workflow assessment, events analysis, risk management, environment analysis, costs management, successful business model analysis, business cycles analysis, utilization of successful business managers experiences, and applied business intelligence are some of the most significant issues in KaaS concept” (Sadeghzadeh et al., 2014). All in all, KaaS will be beneficial to an organization as it will help eliminate the issue of repetitive behavior or more room for error.

These advancements in technology for an organization is ideal in order to reach optimal results and success for growth.

### **How has Cloud Computing Improved Knowledge Management?**

It is important for organizations to be able to obtain valuable information from senior management and employees before they retire or leave the organization. This is done so that values of an organization can be upheld or so that knowledge of past information can help in reform for an organization. Cloud computing supports knowledge management with technology and enables organizations to overcome challenges. It is more likely that by using cloud computing, knowledge management systems would be able to overcome security hurdles (Aksoy & Algawiaz, 2014).

Emerging technologies such as cloud computing have aided organizations, especially small and medium enterprises by reducing the costs of setup and maintenance fees. Cloud computing is not only convenient, but offers on demand self-service, the ability to share IT resources, rapid elasticity ability and a model subscription of “pay-as-you- go.” New practices may emerge when knowledge management is combined with cloud computing. It raises the opportunity for organizations to discover and apply new business models and the ability to exchange and share information throughout the organization (Rafiq, Bashar, & Shaikh, 2014). Having the ability to do so, will increase the value that cloud adoption brings to an organization and its employees.

Compatibility is achieved due to cloud computing having features that facilitates the use and understanding of using it. Users are able to retrieve data and information from any wireless device or personal computer as they please when cloud computing is applied to knowledge management (Daud & Rahman, 2017). This mobility increases convenience and decreases the

amount of time wasted if the knowledge management data would only be accessible through a single office computer and the accessible applications that can be shared.

The cloud environment does invite a degree of risk due to sharing resources and information through applications and systems managed by third party vendors. The risk of data leakage would be minimized if the organization would utilize their own servers and resources instead of relying on cloud computing for knowledge management. If the organization relies heavily on cloud computing, then there is a risk of job risk for employees within the IT department. There would be a fewer need for the personnel to go over the maintenance, technological deployment, application development and infrastructure management. Hence, causing low morale and commitment of the IT personnel remaining (Aksoy & Algawiaz, 2014). Although there is this downside to not having in-house staff members, it would also bring the advantage of decrease of cost. If managed appropriately and the organizational leaders attend the intended training sessions before and during adoption, the organization will know how to fulfill any concerns that they may come across.

Depending on the cloud computing vendor the organization uses, the vendor may be a relatively new company compared to the established organization or compatibility within systems may not be achieved. The projected profitability and longevity of cloud computing may potentially be questionable. There may be an operational interruption during the transition of traditional knowledge management systems to cloud computing causing additional time needed to implement, thus increasing expenses (Aksoy & Algawiaz, 2014).

A research project done by APQC surveyed 300+ professionals involved with using the cloud for their knowledge management stated there were different reasons why they changed their

strategy. Most advised the reason why the change to the cloud was due to being able to access the data “from anywhere on any device.” Which in turn, refers back to the service models that cloud computing offers. With the help of the models, there is the increased activity of accessibility from any location and platform. The first model in particular, IaaS will be the most helpful in this case, as it primarily functions with no given infrastructure. The service model would have to help the customer become knowledgeable on accessing information accurately and efficiently. Knowing that one has access to organizational information and applications at their fingertips, from any given location, changes everything that an employee or customer has to offer in terms of reaching success, milestones, benchmarks or goals that the department or organization is wanting to obtain. Organizations will be able to administer and reach success at a quicker rate. As illustrated in figure 3, other reasons included reduction of costs, improved information visibility and the sharing of the information, the flexibility to add storage, apps and features when needed, and ultimately to provide better real-time collaboration capabilities (Trees, 2019).

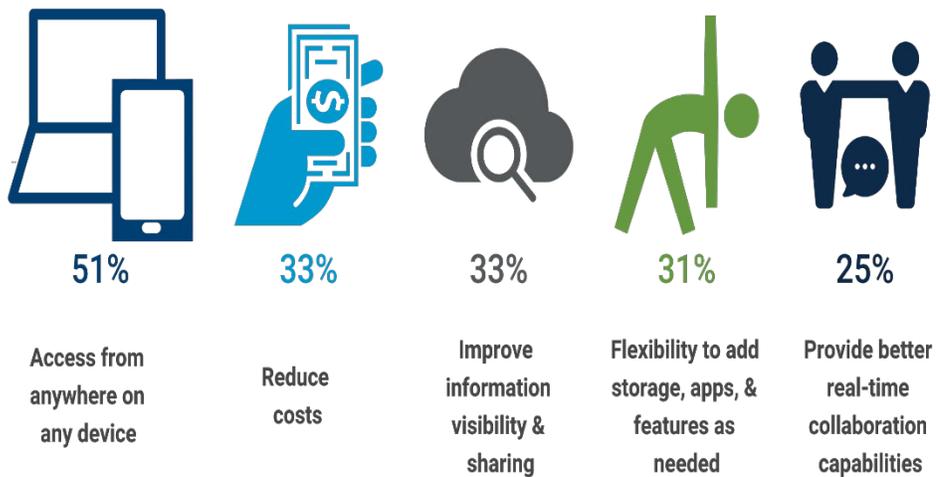
The ability of the cloud platform to reduce costs by not having to purchase high-price software licenses, on-site cost of employees and uncertain upgrade costs make the cloud highly appealing, but it is not the number one reason these professionals made the switch to cloud.

Figure 3

*Key objectives for moving content and collaboration to the cloud*

### What were your organization's main objectives in moving enterprise content and collaboration to the cloud?

*Percentage listing each among their top two motivators*



The main reason professionals migrate knowledge management to the cloud is the ability to access the data from different devices and the ability to expand access to business applications (Trees, 2019).

In regard to the improved information visibility, the cloud allows for greater avoidance of silos, but only if the organization has well-established cross-company partnerships and modernizes or reorganizes security accesses and data allocation (Trees, 2019). Real-time collaboration capabilities will work with the benefits of the cloud, if the infrastructure of the organization allows it. The organization's culture has a lot to do with the success of the implementation of technological changes within the company. The organization personnel have to have the ability to

collaborate with each other for the migration of knowledge management on the cloud to be able to be effective.

IT and KM professionals are in more need than ever before for greater agility and the flexibility to add storage, apps and features. These leaders want to be able to have the flexibility and swift ability to act and make any necessary changes when technological advances and innovations come up. With the advancements of IT in this ever growing industry, the need for cloud adoption is evident and real. The potential that IT and KM professionals hold with this adoption, will change all decision making processes and the duration as well.

IT relies on modern technology and best practices within the industry. Industry-standard methodologies would consider moving to the cloud as a best practice approach to handling knowledge management. Agility would be allowed by promoting and facilitating knowledge management through the cloud. If the IT department wants to improve their overall organizational performance, they would highly consider the cloud to close any gaps in their knowledge management. Cloud computing is defined by the National Institute of Standards and Technology as on-demand self-service, broad network access, rapid elasticity, measurable service, and resource pooling (Orr, n.d).

The cloud is able to improve knowledge management, thus improving demand management, capital, operational cost management and customer satisfaction overall. On top of that, software development and testing on any potential risk management and sudden changes in the industry due to technology advancements can assist with the agility to recover quickly, improve training and personnel development. In order for the organization to have a competitive advantage over its competitors, it must be able to have a clear understanding of their value network. Unison

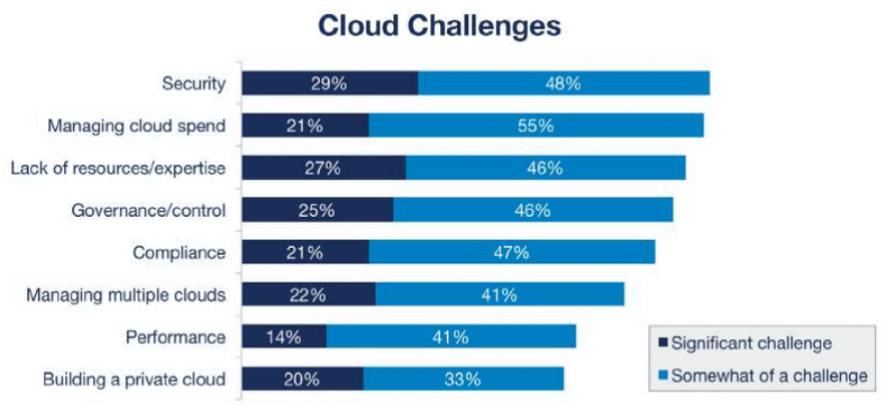
and collaboration between their personnel, partners, processes, and technology would only empower the usage of cloud computing to achieve their business goals and strategies.

The usage of cloud computing fosters an environment of overall cohesion and unity. It creates a trusting and collaborative medium where it benefits the overall supply chain integration (Daud & Rahman, 2017). In order to handle the data better in the knowledge management system, the organization will fare better if the data is able to be looked up quicker and establish stronger access approaches. The cloud will help with deploying solutions faster, maintaining knowledge with ease, web services will connect technology quicker, and will merge the digital and human capital channels (Simone, 2018).

As illustrated in figure 4, organizations still have reservations about moving knowledge management to the cloud. One of the main concerns is moving sensitive and confidential information over virtually. Theft of intellectual property is highly possible, for this reason organizations should do their due diligence when evaluating and accessing security reviews of vendors when selecting a cloud web service. The terms and conditions on the contract should also be reviewed carefully because the vendor may later be able to claim confidential information.

Figure 4

*Challenges of Cloud Computing*



Compliance violations such as violating certain government violations could occur when all staff share the same cloud base web service. This can lead to loss of control over confidential data. An example of this, could be a former employee may steal sensitive information and share it with competitors. The conversion of data exfiltration techniques from attackers could encode confidential information into video files such as video-sharing platforms like YouTube. Knowledge management systems that have certain authorization requirements have to be considered when selecting a cloud vendor due to an unauthorized employee inputting restricted data into the cloud. Cloud Industry Forum alleges that regardless of the data security concerns, 99% of cloud based knowledge management system users have not experienced any breaches (Batia, 2016).

Some organizations will find the need to manage more than one cloud, combining public and private clouds. Enterprises could find themselves lagging behind cloud technologies advances due to lack of resources and expertise, yet depending heavily on cloud computing. Investing in training of IT professionals could ease the workload dependency on the cloud. If an organization is considering building a private cloud to have all data in-house, it may take a large amount of time invested to achieve this (Durcevic, 2020).

## **Quality Control**

Lean six sigma is a method used to improve a process and prevent or minimize errors as much as possible. The process reviews the complexity of any issues from a customer's standpoint and then evaluates the data to identify the main issue the organization is facing. Companies skilled in quality improvement practices outperform their competitors in profitability and overall growth (Powers, 2014). Knowledge management can be improved through cloud

computing by leveraging the use of six sigma. Through cloud computing, six sigma will grant the organization to track, analyze, detect and adjust any results more efficiently (2018).

Cloud computing supports security and quality control by providing a space to back up data. The cloud provides additional transparency and control which is favorable to organizations that work with eco-friendly products. Quality control combined with the cloud allows big enterprises as well as small and medium organizations to handle knowledge management efficiently and effectively while saving costs. The end effect would be the consumer benefitting from the quality of the organization's knowledge management which produces better, safer and superb products and services (Arsene, 2020).

Cloud computing is able to help with quality control because it will be able to handle knowledge management more efficiently. This will be able to improve productivity because the processes and procedures will be able to achieve steady and exceptional results.

The cloud helps with quality control when it deals with security measures by protecting the digital safety of the organization's assets.

The cloud is able to secure and protect data by not granting access to personnel not authorized to handle certain information. This will secure access to such data and not compromise delicate information. The way that quality control can be enabled by cloud computing is the cloud will use different methods to secure data that would not be possible with just using a network or single server. The cloud would allow for greater security and hackers would have a harder time accessing the organization's data and information.

Quality control with the cloud would have the capability to back up data, garnering greater security. Quality control and assurance makes sure that the product or service that the organization

offers does not produce or at the very least minimizes the likelihood of producing unsafe, expired or outdated nor ineffective products or services. Having good quality control helps protect and keep the customer in the long run and keep customers safe (Arsene, 2020).

With cloud computing, easier scalability is possible. If the company is growing rapidly, then cloud computing makes it more accessible to quickly scale up the capacity to work with more extensive data. Another advantage with cloud computing is that if any scale-down is needed then it is possible to do so as well. The storage and control of the knowledge management system benefits from cloud computing because it allows for personnel to have a better hold on the data, storing information and overall security of the knowledge management. Any sort of filing needed would not really be needed for storage since information would be stored in the cloud. This would reduce any potential human errors and increase accuracy. It causes a reduction in the carbon footprint because with the cloud, as stated earlier, consumption on any files or paper is greatly reduced. The ability to scale up and down on the cloud also reduces the amount of energy used for the knowledge management process (Outsource to India, (n.d.)).

A research carried out by Infosys on the parameters of the cloud such as business risk, business value, relative simplicity and cloud technology maturity for cloud adoption based its analysis on the cloud as a software, platform and infrastructure. It compared SaaS on the areas of collaboration, enterprise applications, business and industry applications, PaaS on web 2.0 applications, databases, and middleware and lastly IaaS on QA/DEV environments, storage, servers, networks and production custom applications. Table 1 compares and rates the cloud type against each parameter evaluated. Organizations run a high business risk migrating live applications to the cloud, but they can minimize the risk when adapting the cloud with quality

assurance (QA) environments (Naganathan, 2012).

Table 1

*The use case evaluation for cloud adaptation*

Typical Cloud Use Cases		Risk	Business Value	Relative Simplicity	Cloud Tech Maturity	Overall
SaaS	Collaboration	M	M	M	H	M
	Enterprise Applications	M	H	L	M	M
	Business / Industry Applications	M	H	L	M	M
PaaS	Web 2.0 Applications	L	M	H	H	M
	Databases	M	M	L	H	L
	Middleware	L	M	L	M	L
	QA/DEV Environments	L	H	H	H	H
IaaS	Storage, Servers, Networks	M	M	M	H	M
	Production Custom Applications	H	M	L	L	L

Business value benefits from the SaaS platform for its ability to be a market ready solution with a short turnaround time. The organization gains with SaaS when used in cloud form for their QA environment usage due to an increase in asset utilization, reduced proliferation, increased serviceability and agility. Cloud adoption for QA environments in SaaS and PaaS assists with greater ease of implementation of secure authentication and secure policy enforcement. Among all the parameters, adopting the cloud in QA/Dev environment had the advantages of increased asset utilization, reduced proliferation, increased agility in service delivery and quicker release cycle times (Naganathan, 2012).

The primary factors for using Cloud Computing may be cost, quicker DevOp and DevTest process, minimized risk and agility. However, other strategic goals such as top market

position, innovative products and ideas, competition and a productive workforce are the reasons why companies are looking towards the Cloud. This can be facilitated by using the five Knowledge Management processes: knowledge acquisition, creation, storage, sharing and usage.

The benefits delivered by cloud-based QA environments are the dynamic and scalable provisioning, reducing implementation from months to just a few minutes. This enables organizations to deliver high quality services. It also assists organizations in focusing less on procurement operations and more on core areas. Greater productivity is carried out with shorter life cycles for application development and testing, reducing time to market a product or service. QA environments in cloud adaptation will allow for greater environment control by reducing the amount of servers and applications used. Projects are able to be consolidated into a single channel. Total cost of ownership is reduced, and resource utilization is improved with cloud-based QA environments. The reduced costs of hardware and software licenses by using cloud computing allows for cost savings of about 50% on IT support expenses (Naganathan, 2012).

### ***Conclusion and Implications for Theory and Practice***

Cloud computing is the forefront of the technological revolution. With its advances, organizations are able to make an immense amount of change in their level of productivity, shareability, and overall security of their information. The switch from knowledge management to cloud computing is ever growing and organizations will need to learn the capabilities that it has to offer. Although there is a decrease in job availability due to the technological advancement of cloud computing and some fear of if the service will be able to hold up a large duty of an organization's information. It should be heavily noted that the service is well thought

out and filled with skilled professionals in relation to training and servicing any concerns the customer may have.

In addition, this is all achieved through the four service models that cloud computing is made up of, Infrastructure as a Service, Platform as a Service, Software as a Service and Knowledge as a Service. The service of these four models is what makes the move to cloud computing that much more exciting and inviting, because there are intriguing pulls behind each. With the running knowledge of knowing that there is an incentive with each service, an organization has no worry when it comes to having to prioritize a buildout, losing revenue, creating their own applications based on personal preference, or being on a knowledge overload. The models cater to the customer's needs and carries out the daily functions of those that are actively using them. Even though each model has its own function, it is important to understand as to how they flow into each other and fill any gaps that the other may have, in order to be a success.

There are a variety of reasons why organizations should move knowledge management to the cloud. The main benefit of moving knowledge management to the cloud is the decrease in time business leaders will need to find and access information. The ability to login into any device from any location to access the information through the cloud offers flexibility and accommodates personnel, which increases productivity. Using cloud for knowledge management allows organizations to have a greater likelihood of compatible system integration among customers, suppliers and business partners within the supply chain. New developments within the personnel and projects are able to be facilitated and created within the cloud with much more ease and due to the cloud being web-based, cost is greatly reduced.

However, with certain benefits, also comes certain challenges when handling knowledge management within the cloud. Although data security may be guaranteed with the cloud, there also is a risk that because the cloud is a web base service offered by a third party vendor, chances of data breach are higher. If the vendor has any issues with the cloud base service it may interrupt business processes, especially causing major disruption at inconvenient times. The potential lack of reliability could be a threat to business operations. Even though cost should be reduced by using the cloud, for small and medium enterprises having to purchase licenses for this service could be costly, especially if their operations are not compatible with the vendor of the cloud service. When the organization decides to move knowledge management to the cloud, they will be reducing the cost of IT personnel, set up and maintenance fees which produces job risk for the organization's employees, ultimately affecting morale.

Another way that organizations are able to reduce their costs is through quality control. Knowledge management is improved through cloud computing when six sigma methodology is used. Cloud computing merged with knowledge management will allow the organization to keep better track, detect, adjust and analyze any results more efficiently. Security can also be more accomplished due to the cloud being able to store and back up information. Six sigma will cause better productivity and efficiency for the organization and improve overall knowledge management. The organization's products and services will be able to serve customers more effectively. Using six sigma methods for knowledge management through the cloud reduces errors in general and produces greater end results. There is a greater lead way for accuracy of data and information when six sigma is involved.

Ideally, organizations will need to heavily evaluate the possible adoption of cloud computing and all of the many aspects that are entailed within it. Without doing so, can be detrimental to an organization and their goals as a whole. Through the points that this paper highlights upon, there should be a clear understanding on where an organization should begin in the evaluation process and what determinants will come into play.

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## **A Comparative Study of Students in Online and Traditional Business Administration Degrees in 8- and 16-Week Formats**

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### **Abstract**

The successes and challenges of students in totally online college degree programs continue to be important research topics in higher education. The authors of this study analyzed institutional research data from a two-year period and compared students in the traditional business administration (BABS) degree program with 16-week course format and students in the online (BABX) degree program with 8-week course format. Independent variables of gender, classification, and age were used in the comparison. GPAs of both these groups were further compared to GPAs of all other majors offered within the college. Additionally, faculty members who taught core courses in both formats were interviewed to gain insight on differences in course content, assessment methods, drop rates, student preparation for the course, student performance, cheating, student excuses, class sizes, and other differences in the 16-week versus 8-week courses and students.

### **Introduction**

Universities offering fully online degree programs continuously address a number of educational issues. Maintaining a quality program in an online format is paramount to the ongoing success of any program, and performance of students in the online degree environment is a critical component to be monitored.

However, many of the online degree programs are structured differently than the traditional programs. The differences lie not only in the delivery of the course content, but often in duration of the course and the course content as well. While mini terms have been offered to

students for decades, this format has become more prevalent in the online setting. This can lead faculty and administration to question the difference in student outcomes in the different settings.

Like many universities, the number of students enrolled in a fully online business degree has grown over the last few years at the researchers' university (a mid-sized public university in the south). The University's College of Business employs a full-time business advisor for the students in the fully online Bachelor of Business Administration degree (coded as BABX), as well as having a Director of Online Business Education within the college. Frequent discussions between these two individuals have focused on BABX students' successes and failures. The advisor and director have questioned whether faculty teaching in both the BABX and non-BABX classes noticed a difference between the students in terms of drop rates, class preparation, class performance, excuses, cheating, and other possible differences. In addition, do faculty report any difference in the content of their courses and class size when comparing the two student populations. While the advisor and director have observed certain things, they question whether their thoughts and concerns match those of faculty teaching the core courses required for all college of business majors.

### **Statement of the Problem**

The researchers looked at demographic information provided by the Institutional Research Office concerning all majors within the college, including six traditional majors and the fully online business administration (BABX) major. The analysis was conducted to determine the following:

- How do the GPAs of BABX students compare to students' GPAs in the other traditional majors within the college?

- Based on a comparison of students in the traditional business administration major (BABS) and students in the online business administration major (BABX), how do the two groups differ based on the variables of gender, age, and classification?

A final focus of this paper investigates what business faculty at researchers' university perceive to be differences in courses delivered in an 8-week format versus courses delivered in a 16-week format. Representative faculty teaching numerous courses in the College of Business core curriculum were interviewed to gain their thoughts and opinions based on their knowledge and experience in teaching both traditional students (typically taught in a 16-week format) and those that include only online degree business administration students (all taught in an 8-week format). Specific questions in the interviews asked faculty opinions to gather the following information:

- What, if any, differences are there in the amount of content presented in the 16-week (traditional degree program course) versus 8-week (online degree only course) formats?
- What, if any, differences are there in the methods used to assess student learning in the 16-week versus 8-week formats?
- How do the drop rates compare in the 16-week versus 8-week formats?
- How does student preparation for the course compare in the 16-week versus 8-week formats?
- How does student performance in the class compare in the 16-week and 8-week formats?
- Is there more cheating in one course format versus the other format? Also, how does cheating impact students' final grades?
- How do the types and numbers of student excuses compare in the 16-week and 8-week formats?

- Are there any other differences when comparing the 16-week and 8-week formats and students?
- What is the average class size in the 16-week versus 8-week formats?

### **Literature Review**

Numerous issues must be considered when designing and executing a fully online degree. Over the past two decades many articles have been published related to online instruction. Kebritchi, Lipschuetz, and Santiago's 2017 article provided a synthesis of prior studies and the challenges of online instruction. Their research identified key issues in three major categories: issues related to online learners, issues related to online instructors, and content development. While several issues were identified in each of the three categories, one key issue for learners was readiness, and two key issues for instructors included teaching style and changing faculty roles. In the area of content development, integration of multimedia into content was a key issue. All these issues relate to the focus of the current study.

When designing an online program, the length of courses must also be considered. Prior to the growth of online courses, Austin and Gustafson (2006) found that three-, four-, and eight-week courses significantly increase student performance over those in a traditional sixteen-week format. Their research further analyzed if this success showed greater learning of course material or if the bar was lowered in the accelerated courses; findings revealed that in classes with identical course content, the students did show greater learning of the material in compressed formats. In a study by Ferguson and DeFelice (2010), students perceived a higher level of learning in the compressed format course, but the data did not support those perceptions.

Burrus, Lynne, and Shaw (2014) compared an 8-week versus a 12-week format in three higher education graduate programs, looking specifically at course length and impact on time to

degree completion, grade point average, and graduation rates. Reviewing the data from 400 students, they found that the 8-week format showed higher graduation rates and shorter time to degree completion. In addition, there was not negative impact on GPA during the shorter duration courses.

Lee and Horsfall's study from 2010, compared the transition of over 500 students from a 12- to 6-week format. While 76% of the students and faculty felt the accelerated learning experience was positive, concerns were addressed regarding student workloads, absences, and group projects. Students stated concern that the accelerated format did not take into account students who work fulltime, and any absences have negative effects due to the pace of the course. In addition, faculty found assigning group work more challenging in the compressed format. Similar to other studies, Lee and Horsfall identified timely feedback from faculty, time management by students, and communication as keys to success. In addition, faculty felt the number of accelerated courses a student was enrolled in at one time should be limited for better outcomes and success.

Gillett-Swan (2017) reminds us of the important reality that the one-size-fits-all approach to any format or structure of a class can present barriers to success for online students, while face-to-face students might better succeed in such a design. If the barriers impact online student success in a course that in turn is a prerequisite for a later course, the learning challenges can compound for the online students as they progress in their degree programs.

Looking at online course instruction from the perspective of faculty, Sithole, Mupinga, Kibirige, Manyanga, and Bucklein (2019) shared survey findings from faculty at four universities in the midwestern U.S. Among key challenges identified were large class size, lack of communication with students (yet too many emails), and lack of student self-discipline.

Terenko and Ogienko's survey of students found students themselves reported challenges of lack of self-study skills and lack of live communication. Ferguson and DeFelice (2010) found that students in "intensive" 8-week courses were less satisfied with the communication of faculty, but more satisfied with the communication among classmates.

Baum and McPherson (2019) also noted that students with more access and exposure to technology, who do have strong time management and self-directed learning skills typically perform better in online learning environments. Milman (2014) earlier noted that online students may struggle with inadequate preparation for specific courses, as well as struggle with insufficient guidance in how to be successful self-directed learners. These two challenges, coupled together, can significantly impact a student's ability to succeed in an online degree.

Moten, Fitterer, Brazier, Leonard, and Brown (2013) specifically looked at challenges of dealing with academic dishonesty in the online course environment. This nine-year-old study noted the problem as becoming more rampant in recent years. Given the significant developments in new technology since the publication of that study, it is not surprising that more recent studies such as Sithole, Mupinga, Kibirige, Manyanga, and Bucklein (2019) continue to find academic dishonesty in online courses a major challenge.

The studies cited above identify a number of challenges online degree students face, no matter what the length of the course. Thus, looking at the challenges and successes of online degree students working in an 8-week course structure is worth investigating. A further comparison with students who study in a traditional 16-week course format (with the same major) may reveal additional helpful findings for future curriculum design or faculty teaching strategies.

## **Research Methodology**

Two of the authors work in the Office of Online Business Education. Their conversations have turned to the question of how the online students compare to the traditional students in several settings. Using this concept, the authors determined what data to request from the university's Institutional Research Office along with questions to be used to interview faculty who teach in both settings.

The University's Institutional Research Office provided demographic information regarding business administration online degree students (BABX) and students seeking other degrees within the College of Business Administration (CBA) in a traditional setting. Requested data included gender, year classification, major, age, parish of residence, GPA, and hours carried per semester.

In addition to the above data requested for analysis, nine courses within the CBA core curriculum required in all business majors were selected for this research project. Those nine courses include Intermediate Financial Accounting I (ACCT 321), Business Law (BSAD 221), Strategically Managing Organizations (BSAD 490), Management Information Systems (CIS 231), Principles of Microeconomics (ECON 211), Financial Management (FINC 302), Operations Management (MNGT 368), Marketing (MKTG 300), and Business Statistics II (QBA 283). This selection ensured that all disciplines within the core curriculum are included in the analysis of findings.

For each of the nine selected academic courses within the College's core curriculum, a representative faculty member who teaches both 16-week and 8-week students was interviewed. The authors created a list of interview questions; the University's Human Subjects Institutional Review Board then reviewed the research plan and granted approval to proceed with the request

of data from the Institutional Research Office. The requested data were analyzed using SPSS. The results are discussed below in the data analysis sections of the paper.

### Data Analysis of College Data

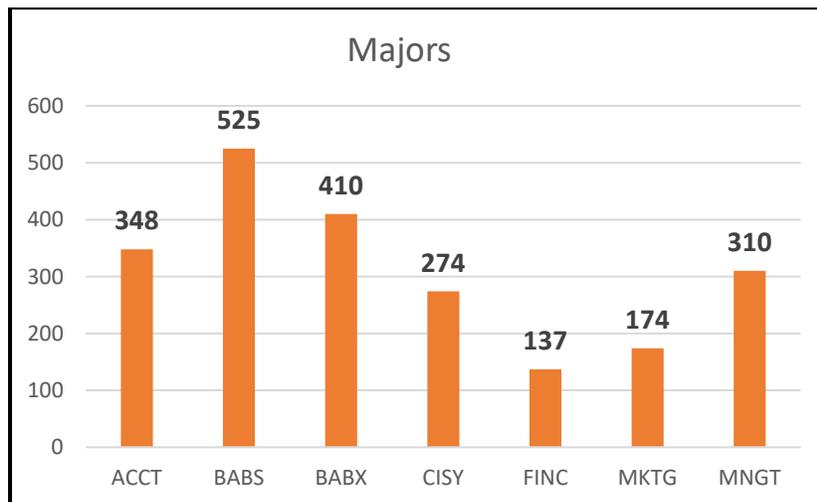
Data from fall 2018 through summer 2021 were collected. If a student was listed in more than one semester, only the most recent semester of information was used for that student. After exclusion of duplicates, 2,178 students were enrolled across the different majors offered within the College of Business Administration.

#### College Demographics

Four independent variables including major, gender, classification, and age group were analyzed. Across the different CBA majors, the counts were as follows: Accounting (ACCT) 348, Business Administration (BABS) 525, Business Administration Online (BABX) 410, Computer Information Systems (CISY) 274, Finance (FINC) 137, Marketing (MKTG) 174, and Management (MNGT) 310. BABS had the most majors with 525 students, while the smallest major is FINC with 137 students as shown in Figure 1.

**Figure 1.**

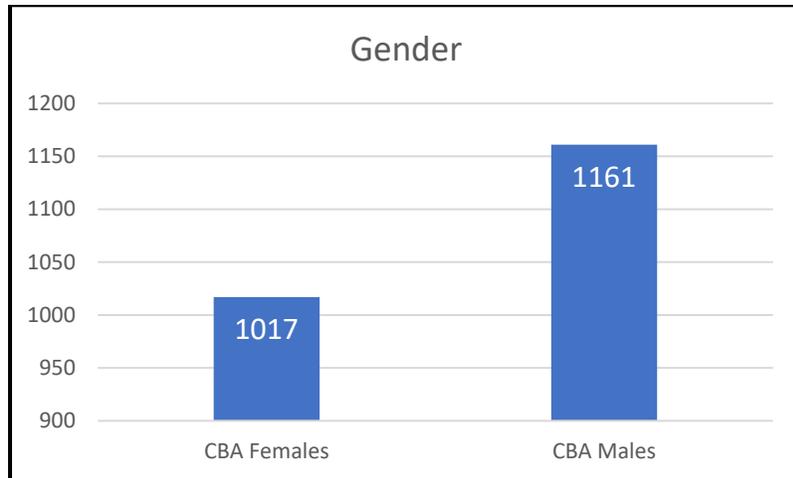
*Counts by Major.*



Of the 2,178 students compared, 1,161 were CBA males and 1,017 were CBA females as shown in Figure 2.

**Figure 2.**

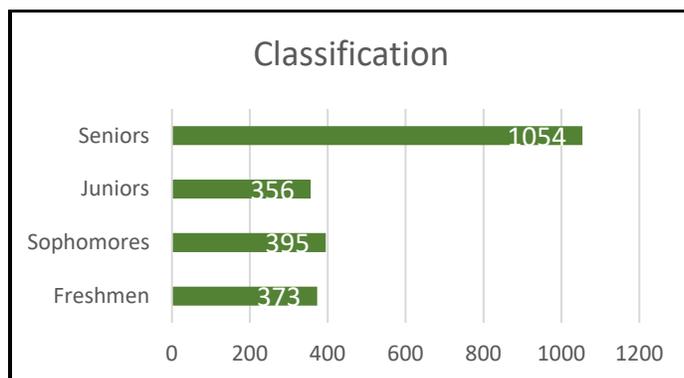
*Counts by Gender.*



Looking at the Classification breakout, Seniors (1054 students) greatly outnumber the remaining students. The remaining students are somewhat evenly distributed with Freshmen, Sophomores, and Juniors having counts of 373, 395, and 356, respectively. Figure 3 depicts the totals.

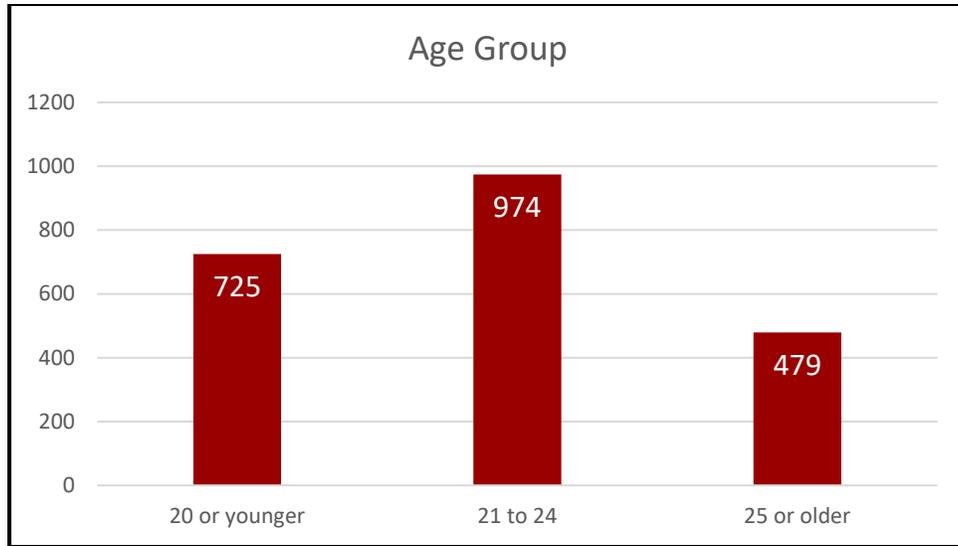
**Figure 3.**

*Counts by Classification.*



Most of the CBA students fall within the traditional college ages of 18 to 24 years of age. The students 25 years of age or older was the smallest count of the three age groups illustrated in Figure 4, with only 479 in that group.

**Figure 4.**  
*Age Group Counts.*

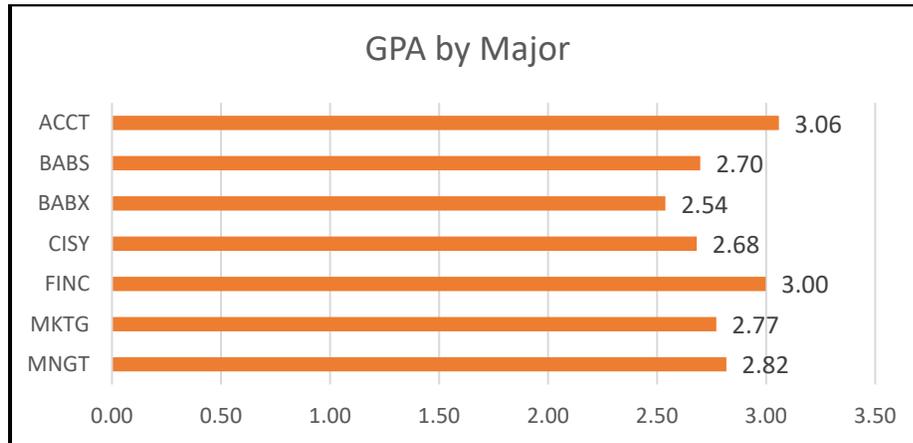


### **Comparison of GPAs across the College – Analysis of Variance by Major**

Grade point averages (GPA) were computed for each major. Students majoring in Accounting had the highest overall average, 3.058, while the Business Administration Online students had the lowest overall average of 2.538. The remaining averages by major are shown in Figure 5.

**Figure 5.**

*Comparison of GPA by Major.*



For the **Major** comparisons, the following hypothesis was determined.

***H<sub>0</sub>***:  $\mu_{ACCT} = \mu_{BABS} = \mu_{BABX} = \mu_{CISY} = \mu_{FINC} = \mu_{MKTG} = \mu_{MNGT}$ , where ACCT represents Accounting, BABS – Business Administration, BABX – Business Administration Online, CISY – Computer Information Systems, FINC – Finance, MKTG – Marketing, and MNGT – Management.

Due to a failed Levene's test for homogeneity of variances, Welch's Robust Tests of Equality of Means was carried out. There was a statistically significant difference between groups as determined by the ANOVA ( $F(6, 2171) = 23.200, p = .000$ ) as depicted in Table 1. The results of the Games-Howell post hoc test revealed that the GPA of the ACCT majors ( $M = 3.06, SD = 0.67$ ) were statistically significantly higher than the BABS majors ( $M = 2.70, SD = 0.71, p = .000$ ), BABX majors ( $M = 2.54, SD = 0.63, p = .000$ ), CISY majors ( $M = 2.68, SD = 0.71, p = .000$ ), MKTG majors ( $M = 2.77, SD = 0.72, p = .000$ ), and MNGT majors ( $M = 2.82, SD = 0.63, p = .000$ ). There was no statistically significant difference between the ACCT majors and FINC majors ( $p = .969$ ).

The GPAs of BABS majors were statistically significantly higher than the BABX majors ( $M = 2.54, SD = 0.63, p = .006$ ), but were statistically significantly lower than the FINC majors ( $M = 3.00, SD = 0.64, p = .000$ ). There was no statistically significant difference between the BABS majors and CISY majors ( $p = 1.000$ ), MKTG majors ( $p = .905$ ), and MNGT ( $p = .159$ ).

BABX majors had GPAs statistically significantly lower than the FINC majors ( $M = 3.00, SD = 0.64, p = .000$ ), MKTG majors ( $M = 2.77, SD = 0.72, p = .004$ ), and MNGT majors ( $M = 2.82, SD = 0.63, p = .000$ ). There was no statistically significant difference between the BABX majors and the CISY majors ( $p = 0.95$ ).

CISY majors had GPAs statistically significantly lower than the FINC majors ( $M = 3.00, SD = 0.64, p = .000$ ). There was no statistically significant difference between the MKTG majors ( $p = .856$ ), and MNGT ( $p = .193$ ).

For the remaining comparisons, there were no statistically significant outcomes.

**Table 1.**

*One-way ANOVA for Major.*

**CUMULATIVE\_GPA**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	63.672	6	10.612	23.200	.000
Within Groups	993.030	2171	.457		
Total	1056.703	2177			

## Data Analysis of BABS and BABX Comparisons

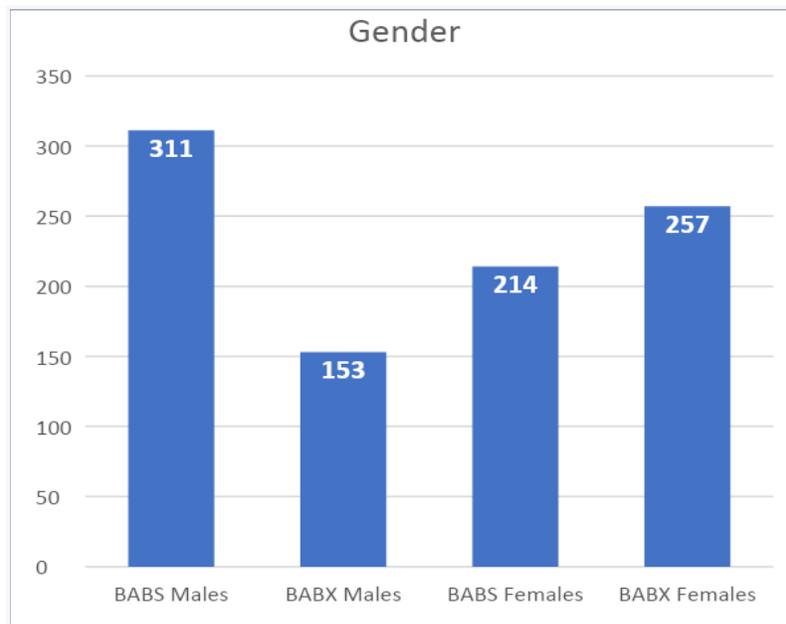
Five hundred twenty-five students were part of the BABS and 410 were enrolled in or had recently been a part of the BABX program.

### BABS versus BABX Demographics

Three independent variables including gender, classification, and age group were analyzed in BABS and BABX groups. Of the 935 students compared, 311 were BABS males, 214 BABS females, 153 BABX males and 257 BABX females as shown in Figure 6. In BABS more males were enrolled; in BABX, more females were enrolled.

#### Figure 6.

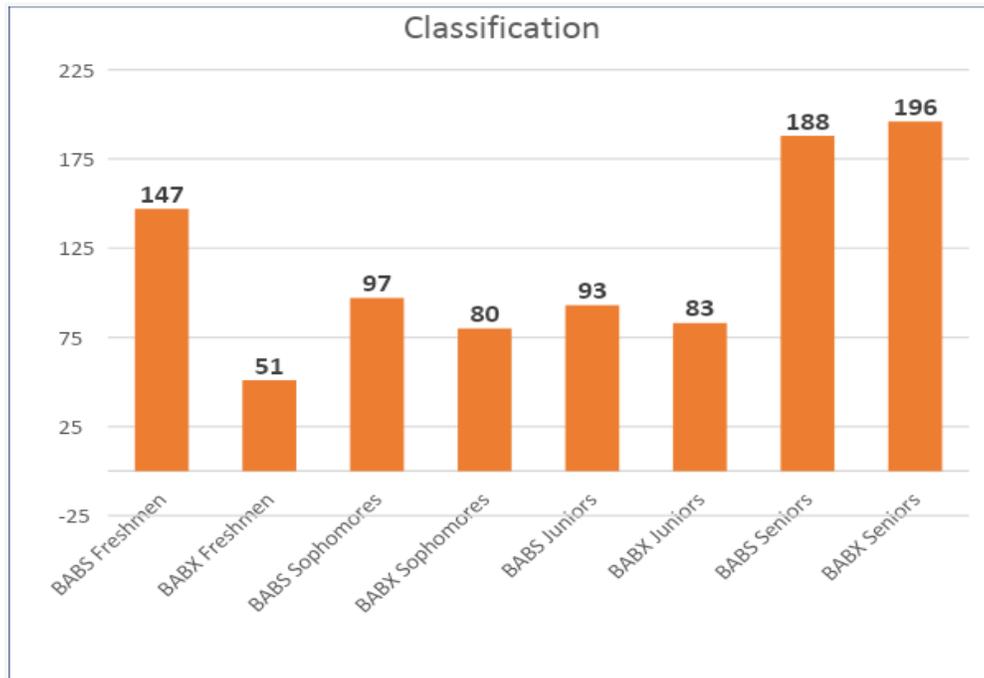
*Gender Counts.*



Looking at the Classification breakout, BABS Freshmen outnumber the BABX Freshmen with counts of 147 and 51, respectively. Closer counts existed between the remaining classifications with 97 BABS Sophomores, 80 BABX Sophomores, 93 BABS Juniors, 83 BABX Juniors, 188 BABS Seniors, and 196 BABX Seniors as shown in Figure 7.

**Figure 7.**

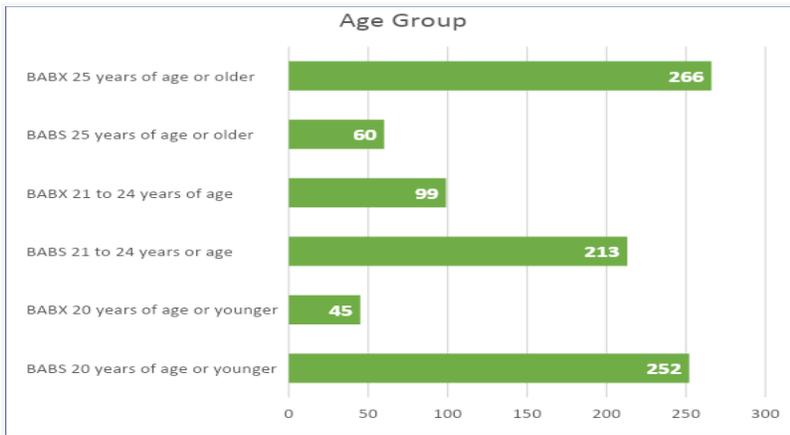
*Classification Counts.*



Disparity in the counts of different age groups existed in each pairing. Two hundred and fifty-two BABS students were 20 years of age or younger while only 45 BABX students were 20 years of age or younger. There were 213 BABS students 21 to 24 years of age and 99 BABX students in the same age group. Sixty BABS students were 25 years of age or older and 266 BABX students fell into the same age group. These values are shown in Figure 8.

**Figure 8.**

*Age Group Counts.*



### **Analysis of Variance of BABS versus BABX data**

Further analysis was conducted for the variables gender, classification, and age. These findings are discussed in the following paragraphs.

**Gender.** A hypothesis was determined for the gender comparisons.

***H<sub>0</sub>*:**  $\mu_{MB} = \mu_{MX} = \mu_{FB} = \mu_{FX}$ , where MB – BABS Male, MX – BABX Male, FB – BABS Female, and FX – BABX Female.

Due to a failed Levene's test for homogeneity of variances, Welch's Robust Tests of Equality of Means was carried out. There was a statistically significant difference between groups as determined by the ANOVA ( $F(3, 931) = 8.846, p = .000$ ) as depicted in Table 2. A Games-Howell post hoc test revealed that the GPA of the BABS females ( $M = 2.81, SD = 0.66$ ) were statistically significantly higher than the BABS males ( $M = 2.62, SD = 0.74, p = .012$ ), BABX females ( $M = 2.59, SD = 0.62, p = .001$ ), and BABX males ( $M = 2.45, SD = 0.65, p = .000$ ). There was no statistically significant difference between the BABS males and BABX males ( $p = .067$ ) and BABX females ( $p = .936$ ).

**Table 2.***One-way ANOVA for Gender.***CUMULATIVE\_  
GPA**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12.106	3	4.035	8.846	0.000
Within Groups	424.690	931	0.456		
Total	436.796	934			

**Classification.** For the classification comparisons, the following hypothesis was determined.  $H_0: \mu_{FRB} = \mu_{FRX} = \mu_{SOB} = \mu_{SOX} = \mu_{JRB} = \mu_{JRX} = \mu_{SRB} = \mu_{SRX}$ , where FRB – BABS Freshmen, FRX – BABX Freshmen, SOB – BABS Sophomores, SOX – BABX Sophomores, JRB – BABS Juniors, JRX – BABX Juniors, SRB – BABS Seniors, and SRX – BABX Seniors.

There was a statistically significant difference between classification groups as determined by the one-way ANOVA ( $F(7,927) = 7.256, p = .000$ ). Table 3 shows the complete ANOVA results. Fisher’s Least Significant Difference (LSD) post hoc test revealed that the GPAs of BABS freshmen ( $M = 2.45, SD = 0.96$ ) were statistically significantly lower than the BABS sophomores ( $M = 2.72, SD = 0.62, p = .002$ ), BABS juniors ( $M = 2.78, SD = 0.59, p = .000$ ), BABS seniors ( $M = 2.84, SD = 0.51, p = .000$ ), and BABX seniors ( $M = 2.61, SD = 0.49, p = .024$ ). There was no statistically significant difference between the BABS freshmen and BABX freshmen ( $p = .447$ ), BABX sophomores ( $p = .972$ ), and BABX juniors ( $p = .283$ ).

The GPAs of BABX freshmen ( $M = 2.37, SD = 1.00$ ) were statistically significantly lower than the BABS sophomores ( $M = 2.72, SD = 0.62, p = .002$ ), BABS juniors ( $M = 2.78, SD = 0.59, p = .000$ ), BABS seniors ( $M = 2.84, SD = 0.51, p = .000$ ), and BABX seniors ( $M = 2.61, SD = 0.49, p = .024$ ). There was no statistically significant difference between the BABX freshmen and BABX sophomores ( $p = .508$ ), and BABX juniors ( $p = .128$ ).

THE GPAs of BABS sophomores ( $M = 2.72$ ,  $SD = 0.62$ ) were statistically significantly higher than the BABX sophomores ( $M = 2.45$ ,  $SD = 0.64$ ,  $p = .006$ ). There was no statistically significant difference between the BABS sophomores and the BABS juniors ( $p = .578$ ), BABX juniors ( $p = .083$ ), BABS seniors ( $p = .158$ ), and BABX seniors ( $p = .197$ ).

BABX sophomores' GPAs ( $M = 2.72$ ,  $SD = 0.62$ ) were statistically significantly lower than the BABS juniors ( $M = 2.78$ ,  $SD = 0.59$ ,  $p = .001$ ) and BABS seniors ( $M = 2.84$ ,  $SD = 0.51$ ,  $p = .000$ ). There was no statistically significant difference between BABX sophomores and BABX juniors ( $p = .331$ ) and BABX seniors ( $p = .058$ ).

The GPAs of BABS juniors ( $M = 2.78$ ,  $SD = 0.59$ ) were statistically significantly higher than the BABX juniors ( $M = 2.55$ ,  $SD = 0.61$ ,  $p = .024$ ). There was no statistically significant difference between the BABS juniors and BABS seniors ( $p = .450$ ) and BABX seniors ( $p = .056$ ).

BABX juniors' GPAs ( $M = 2.55$ ,  $SD = 0.62$ ) were statistically significantly lower than the BABS seniors ( $M = 2.84$ ,  $SD = 0.51$ ,  $p = .001$ ). There was no statistically significant difference between the BABX juniors and BABX seniors ( $p = .448$ ).

BABS seniors' GPAs ( $M = 2.82$ ,  $SD = 0.51$ ) were statistically significantly higher than the BABX seniors ( $M = 2.61$ ,  $SD = 0.49$ ,  $p = .001$ ).

In summary, GPAs of BABS females were identified as higher than BABS males and BABX males and females. No significant differences in GPAs were found between the BABS and BABX freshmen. BABS students' GPAs were identified as higher than BABX students.

**Table 3.**  
*One-way ANOVA for Classification.*

<i>CUMULATIVE_GPA</i>					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	22.689	7	3.241	7.256	0.000
Within Groups	414.107	927	0.447		
Total	436.796	934			

**Age Groups** A final hypothesis for age group comparisons was developed.

*H<sub>0</sub>*:  $\mu_{1B} = \mu_{1X} = \mu_{2B} = \mu_{2X} = \mu_{3B} = \mu_{3X}$ , where 1B – BABS 20 years of age or younger, 1X – BABX 20 years of age or younger, 2B – BABS 21 to 24 years of age, 2X – BABX 21 to 24 years of age, 3B – BABS 25 years of age or older, and 3X – BABX 25 years of age or older.

There was a statistically significant difference between classification groups as determined by the one-way ANOVA ( $F(5,929) = 2.811, p = .016$ ). The results are shown in Table 4. Fisher’s Least Significant Difference (LSD) post hoc test revealed that the GPA of the BABS 20 years of age or younger ( $M = 2.69, SD = 0.82$ ) were statistically significantly higher than the BABS 21 to 24 years of age ( $M = 2.52, SD = 0.54, p = .033$ ) and BABS 25 years of age or older ( $M = 2.54, SD = 0.62, p = .014$ ). There was no statistically significant difference between the BABS 20 years of age or younger and BABX 20 years of age or younger ( $p = .290$ ), BABS 21 to 24 years of age ( $p = .514$ ), and BABS 25 years of age or older ( $p = .544$ ).

The GPA of the BABS 21 to 24 years of age ( $M = 2.73, SD = 0.61$ ) were statistically significantly higher than the BABX 21 to 24 years of age ( $M = 2.52, SD = 0.54, p = .010$ ) and BABX 25 years of age or older ( $M = 2.54, SD = 0.62, p = .003$ ). There was no statistically significant difference between the BABS 21 to 24 years of age and BABS 20 years of age or younger ( $p = 0.514$ ), BABX 20 years of age or younger ( $p = .157$ ), and BABS 25 years of age or

older ( $p = .544$ ). There were no other statistically significant differences between age groups found.

**Table 4.**  
*One-way ANOVA for Age Groups*

<b>CUMULATIVE_GPA</b>					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.510	5	1.302	2.811	0.016
Within Groups	430.286	929	0.463		
Total	436.796	934			

### **Interview Findings**

Faculty members who teach both in the traditional (16-week) and online (8-week) formats of nine core College of Business courses were asked to answer the questions comparing the course formats in regarding course content and assessment, student success, student behavior, and noticeable difference in course due to formats. Those nine courses included Intermediate Financial Accounting I (ACCT 321), Business Law (BSAD 221), Strategically Managing Organizations (BSAD 490), Management Information Systems (CIS 231), Principles of Microeconomics (ECON 211), Financial Management (FINC 302), Operations Management (MNGT 368), Marketing (MKTG 300), and Business Statistics II (QBA 283).

The initial questions of the survey discussed course content and assessments. When asked, “*What, if any, differences are there in the amount of content presented in the 16-week (traditional degree program course) versus 8-week (online degree only course) format?*” the majority of the faculty stated that the course had exactly the same content. Within the QBA 283 course, a data analytics project was dropped, but skills from that project were still applied in assignments and assessments. When asked, “*What, if any, differences are there in the methods used to assess student learning in the 16-week versus 8-week format?*” answers varied a little

more. Three courses were assessed in the exact same manner, regardless of the 16- or 8-week format. Others stated differences such as participation credit and differences in the format and quantity of assessments.

Next the questions focused on student success in the courses. When asked, “*How do the drop rates compare in the 16-week versus 8-week format?*” two faculty members observed that the drop rate in the condensed 8-week online course was considerably higher than that in the traditional 16-week course. The majority of the other faculty reported that the drop rate was about the same. However, some stated that students in the condensed course seem to drop more quickly compared to those in the traditional setting. When asked, “*How does student preparation for the course compare in the 16-week versus 8-week formats?*” faculty perceptions were again very mixed. Some faculty believed that online students were more prepared for their course and having more non-traditional students allowed for more discussion and real-world experiences. Other faculty reported that students were less prepared for the course; this could be due to the workload of the course, or the material covered in the course. One example is ACCT 321; this course is the follow-up to the introductory Financial Accounting course. Many non-traditional students took the introductory course several years ago and, therefore, are not comfortable with the course material nor are they prepared to move at the pace the course requires. This ties into the student’s performance in the course. Again, the majority of the faculty stated that they saw similar student performance in both formats of the course. A few faculty stated poorer performance of students in their online course.

Additional questions focused on student behavior in the courses. When asked, “*Is there more cheating in one course format versus the other format? Also, how does the cheating impact students’ final grades?*” faculty were divided on this answer. Half perceived that the online

format led to more cheating incidents. Others, perhaps those who revised their assessment methods to have more discussion, open book, and stricter proctoring to offset such events, stated that the cheating was about the same. When comparing student excuses with, “*How do the types and numbers of student excuses compare in the 16-week and 8-week formats?*” Most found that traditional students still had the “traditional” excuses, including poor time management, athletics, overslept, car broke, and the like. However, online students were more likely to ask for extensions due to jobs, family, or health reasons.

The last questions focused on the noticeable difference between the class formats and the class sizes. When asked, “*Are there any other differences when comparing the 16-week and 8-week formats and students?*” faculty discussed the age and experience of the student. The condensed courses had more non-traditional students which allowed for more real-world discussions and experiences, and often a more focused and serious student. However, the format often makes faculty and student engagement more challenging, as well as student-to-student interactions. The condensed format also causes increased stress levels. For the faculty, the condensed format usually had half the number of students as the traditional format, which in a normal setting would allow time for more student interactions. However, at the authors’ university, all 8-week online courses are taught as overload. Thus, the smaller class size is helpful while juggling an already full schedule.

### **Conclusions**

At the researchers’ university, the only fully online business major currently offered is a business administration major (BABX). This study compared students in the online business administration program (BABX) with students in a traditional business administration program (BABS). Additionally, the GPAs of these two groups of students were compared to other

traditional majors within the College of Business (accounting, computer information systems, finance, management, and marketing). Faculty insights on differences in 8-week and 16-week course formats and student performance were also gathered.

When GPAs were compared across the seven different majors offered in the College of Business, the BABS students ranked number 5 out of the 7, and the BABX students ranked number 7 out of 7. The GPAs of BABX students were further compared to GPAs of BABS students based on variables of gender, age, and year classification. In most cases when the designated group of BABS students were compared to BABX students, the BABS students had the higher GPA. The authors speculate that this could be due to the fact most of the BABX students are older when compared to their BABS counterparts. While 64.8% of BABX students were 25 or older, only 11.4% of BABS students fell into that category. The BABX students aged 25 or older represented 55% of the total 25 and older enrollment within the College of Business when all seven majors are totaled. Those in the higher age category often are having to adjust to college-life again, are working, possibly full-time, and may have family responsibilities besides themselves. This is supported by the 2015 article by Stoten comparing age and students' approaches to learning. When comparing first year undergraduates, grouped by traditional and mature students, the mature students reported struggling to learn how to manage studies with working fulltime and life balances; this was especially true with female students.

As for faculty teaching in both formats, many similarities were stated in the course content and student performance. These observations support findings reported by Austin and Gustafson (2006) that shorter courses contribute to student performance without lowering the bar of student learning expectations. Some faculty reported modifications were made to assessment methods within the 8-week course structure. Faculty opinions varied concerning cheating within

the two course formats, as well as student preparation in the traditional versus online course sections. Faculty also identified differences in student excuses in the online versus traditional formats. One thing that was consistent in this study was the class sizes of the 8-week courses were roughly half the size of those same courses in a traditional setting. Because the 8-week courses are taught as overload at the researchers' university, this facilitated faculty communication and assessment of student learning.

### **Future Research**

A further investigation of BABX students concerning their perception of level of learning achieved in the 8-week format and their satisfaction with faculty communication, faculty assessment methods, and communication with other students in the course could reveal helpful information for curriculum planners and faculty. For non-traditional students that are returning to complete a degree, a comparison of GPA before returning to school compared to GPA after returning to a program may provide additional insight.

Other future research would dig deeper and compare the performances of all the majors within the College of Business. There would be a repeat of the same comparison using GPA to determine if there are any differences in performance by major using the independent variables of gender, classification, and age group.

Lastly, while there are less courses being taught in-person in an 8-week format, the performance of students in similar 8-week courses online and in-person could be compared to see what impact the delivery method has on the overall grade and student performance.

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# **A Framework for Business Analytics in Performing Sentiment Analysis in Business Communication**

## **Abstract**

This paper discusses the use of artificial intelligence and data visualization in 21<sup>st</sup> century business communication. The principles of data visualizations of sentiment analysis scoring and meta-data utilizing market-leading technologies of Tableau software provide a framework for sentiment analysis of corporate social media; Python analytics programming language joined with the TabPy Server serves as a guideline for structuring a curriculum incorporating both disciplines. A strategy for incorporating these business analytics in the business communication curriculum is also proposed.

Keywords: Business Intelligence, Data Visualization, Sentiment Analysis, Tableau, Visualization Design, TabPy, Python, Business Communication, Pedagogy, Artificial Intelligence, AI.

## Introduction

Although the idea of a data-driven culture has been around for years (Fitzgerald & O’Kane, 1999), business analytics is a growing area of interest in industry. The need to acquire and review Big Data has become critical for organizations to gain operational insights into problem-solving and decision-making (Lau, et al., 2012). In the 21st century, numerous approaches have been created to address this need. Programming languages such as Python and R take vast amounts of data and perform statistical calculations to reveal hidden insights. For non-data scientists, these numbers and raw stats can be difficult to interpret and transform into easily understood visualizations. However, business intelligence applications such as Tableau and Microsoft's Power BI have become mainstream in communicating this complex information. They allow for creating interactive dashboards that communicate high-level representations of insights with techniques to drill down into the underlying data.

In many instances, the collected data is not in a format that allows for the creation of insights from basic statistical methods of raw numbers. Business communication in the form of textual prose is such a case. The ability to determine the sentiment of a message, whether an email thread, text chain, social media post, or product review, is critical knowledge to businesses. Historically, sentiment analysis of business communication has been performed by manual, time-consuming classification of advertisements, marketing material, emails, memoranda, and other material. However, social media and other electronic messaging have dramatically increased communication volume, frequency, and veracity in all business areas, particularly management and marketing. New business school graduates entering the workplace

will be inundated with information from various communication channels and will be expected to decipher the intent of the message for crucial business insights.

Social media platforms within organizations such as Yammer or Slack allow management to monitor the reception of initiatives, policies, and processes introduced in an organization. Twitter and Facebook can be a window into the external reception of organizations' products, initiatives, and policies. Product reviews on sites such as Amazon reflect the market's perception of products released by companies. These channels all have short narratives that lend themselves to a basic form of sentiment analysis that new entrants in the business workforce will be expected to monitor. The insights gained from business analytics can enhance quality control, can spur product innovation (Stubbs, 2014), and more importantly, can give companies a competitive advantage (Duan et al, 2020).

The rise of data analytics platforms such as Python from Google to assist researchers and practitioners in analyzing numerical and textual data collected by organizations is of the utmost importance to all students in business today. The combination of data visualization tools and data analytic tools creates the field of business intelligence. Entrants in the business world now and in the future will be expected to be well-versed in the ability to interpret data. Therefore, the efforts of business intelligence platforms such as Tableau to allow non-technical business practitioners to perform complex analyses with little training are critical.

In this paper, we will focus on the convergence of these two techniques by using the TabPy Server, allowing Python to operate inside the Tableau data visualization application to simplify the sentiment scoring of collected textual data. In addition, we will outline a framework

and resources for developing course material that introduces students to the concept of sentiment analysis with artificial intelligence and interpretation with business intelligence tools.

### **Business Analytics Framework for Business Communication**

The pedagogical framework for using analytics to analyze business communication is outlined in six parts: sentiment analysis, algorithms, data collection, visualizations, processing, and analysis.

#### **Sentiment Analysis**

Sentiment analysis is the most common form of text classification of messages and determines whether the underlying message is positive, neutral, or negative. The message is typically scored in a range with these endpoints as the classifiers: one as positive, zero for neutral, and a negative one for a negative message. The neutral zone can be of varying size depending on the interpretation of the researcher. The technique is used to assist in the determination of the writer's underlying intention or reaction that caused the message to be sent (Mejova, 2009). Historically, the numerical scoring of messages was conducted by manually reviewing messages and reviewing pre-determined keywords to represent the positive, neutral, or negative intent. The dictionary of keywords would be maintained by the group of reviewers and reduce bias in the manual analysis.

Natural Language Processing is the area of investigation that sentiment analysis belongs to in the data analytics discipline. Sentiment analysis in data analytics performs the same function of determining the polarity of a message. Additionally, it attempts to determine the sender's attitude, evaluations, and emotions. The analysis, in many cases, can be complicated when taking in multiple segments for analysis.

## Algorithms

The Natural Language Processing Toolkit, maintained by Team NLTK and initially released in 2001 under the general use license of Apache 2.0, contains a method of analyzing social media posts called VADER (Valence Aware Dictionary for Sentiment Reasoning). VADER is a model for determining message polarity and the intensity or strength of emotion (Prabowo & Thelwall, 2009). The developers created the NLTK for use with Python, allowing access to this algorithm by installing the NLTK package as an option in the Python installation files. Documentation for the NLTK can be found on the website [www.nltk.org](http://www.nltk.org).

VADER scores the sentiment of a body of text by mapping lexical features of its dictionary to the strength of emotions. The overall score of the text is a summation of the intensity of each word. The algorithm understands that words like "excellent," "joy," "happy," or "love" are positive in polarity. Additionally, VADER recognizes that a phrase such as "did not like" has a negative polarity.

The algorithm measures a word's emotional intensity between four, the most positive and negative four, the most negative. Zero represents a neutral position. The summation of scores of words in a sentence is then normalized to fall between one and a negative one in the same context. The normalization of the scores uses the following formula:

$$\textit{Sentiment Score} = \frac{x}{\sqrt{x^2 + \alpha}}$$

Where  $x$  is the sum of the sentiment scores of the words in the sentence and is a normalization parameter set to the number of words scored in the sentence. VADER is best suited for scoring

short communication versus longer prose such as email or log entries, such as product reviews posted on an e-commerce site (Hutto & Gilbert, 2014).

VADER incorporates five heuristics into its scoring system: punctuation, capitalization, degree modifiers, polarity shifters, and emoticons (Prabowo & Thelwall, 2009):

- The first heuristic, punctuation, considers the inclusion and frequency of question marks and exclamation marks at the end of a sentence, adding or subtracting an empirical number based on whether the sentiment score is positive or negative.
- In the second heuristic, incremental values are added or subtracted from the sentiment score dependent on the amount of capitalization. So, for example, "this taco is amazing" scores lower than "this taco is AMAZING."
- The third heuristic is a degree modifier, for example, "really pretty" as an increase in the intensity of the phrase versus "sort of pretty" as a decrease in intensity. The dictionary contains a section regulated to boosters and dampeners.
- The fourth heuristic includes polarity shifters, such as "but" that change a sentence's positive section and modify the intent. For instance, in a single sentence of a restaurant review from Yelp.com, "The atmosphere was great, but the food could have been better!" the review sentence contains both positive and negative polarities. In this scenario, all the words before "but" have their scores diminished by fifty percent. All the scores after "but" have their valence increased to one hundred and fifty percent. Finally, the algorithm examines a tri-gram of words before a lexical feature to determine if these three words negate the intent of the sentence in combination. *Figure 1* shows an example of the scoring

of two phrases by VADER as it is run in a Python-only environment. The scores reflect the individual scores' negative, neutral, positive, and compound summation.

Figure 1

*Example of VADER scoring in Python-only environment*

```
# Write a Review as one continuous string (multiple sentences are ok)
review = 'The shoes I bought are amazing'

#Obtain the sid scores for your review
sid.polarity_scores(review)

OUTPUT
{'neg': 0.0, 'neu': 0.513, 'pos': 0.487, 'compound': 0.5859}

review='The mobile phone I bought was the WORST and very BAD'

#Obtain the sid scores for your review
sid.polarity_scores(review)

OUTPUT-
{'neg': 0.539, 'neu': 0.461, 'pos': 0.0, 'compound': -0.8849}
```

- Additionally, VADER will score emoticons, such as :-) as a smiling face. The lexicons derived from inventors are described as the "wisdom of the crowds." VADER developers use Amazon Turk, a crowdsourcing platform for individuals or organizations which allows users to post tasks such as taking surveys or, in the case of the NLTK, rating words and phrases. The tasks performed may be voluntary or compensated. Using this platform, the VADER developers can gain a mean score across a wide population using a particular language on the scoring words and emoticons. Using a global platform such as Amazon Turk has allowed the development team to tune the algorithm to the major languages in use around the planet. They provide a ready-made dictionary for practitioners new to the

sentiment analysis process. It is not dependent only on English-speaking countries and is ideal for multinational businesses.

Though the scoring of messages may not agree with the users' own scoring determinations in all instances, it is useful for constructing an experiential learning environment. VADER provides a foundation for understanding the concepts of the methodology. In addition, the NLTK provides several textual analysis methods, allowing practitioners to curate their own libraries. While not covered in this paper, these additional textual analysis methods would be the next logical step in furthering students' understanding of textual analysis.

## **Data Collection**

In creating coursework, best practices indicate that students first observe publicly available data sets before advancing to the collection and analysis of their own data. Kaggle.com and Data.world are two exceptionally well-maintained sources for burgeoning analysts. Both sites have free curated datasets for the general public with additional access and features with a paid subscription. Students must create a free account using their email addresses to download the datasets. In this paper, we will use the Amazon Reviews: Kindle Store Category and Comprehensive Twitter Airline Sentiment Analysis datasets from Kaggle.com as our predefined data for the experiment.

There are a number of ways for students to collect data. However, for introductory purposes, it may be best to use a platform that does not require students to have software coding skills. IFTTT.com is a Web platform that allows students to create a free account and collect Twitter data effortlessly. An applet can be created to follow an organization, individual, or a particular hashtag, such as #watermelons, that will capture all the tweets by those individuals,

organizations, or hashtags (see Figure 2) and write them to an online text storage medium such as Google Drive Spreadsheets (see Figures 3 and 4). In the example below, we followed #bbc and #ThermoFisher.

Figure 2

*IFTTT. Applet Example*

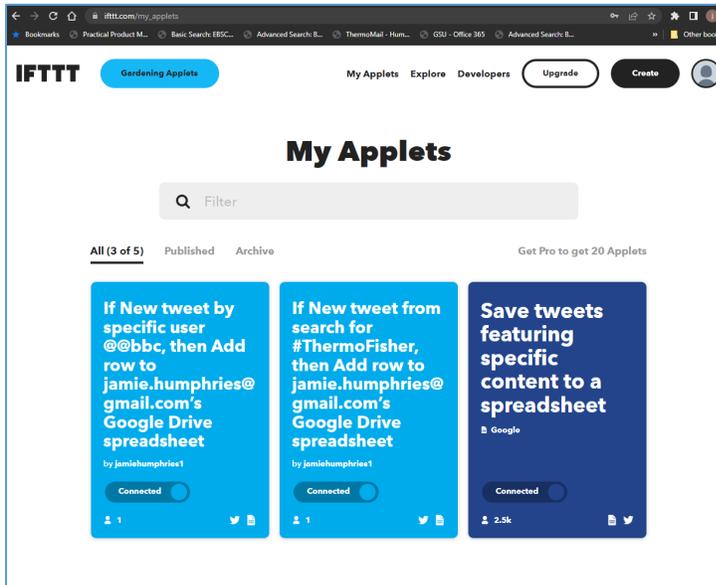


Figure 3

*ITFFF.com Data Storage*

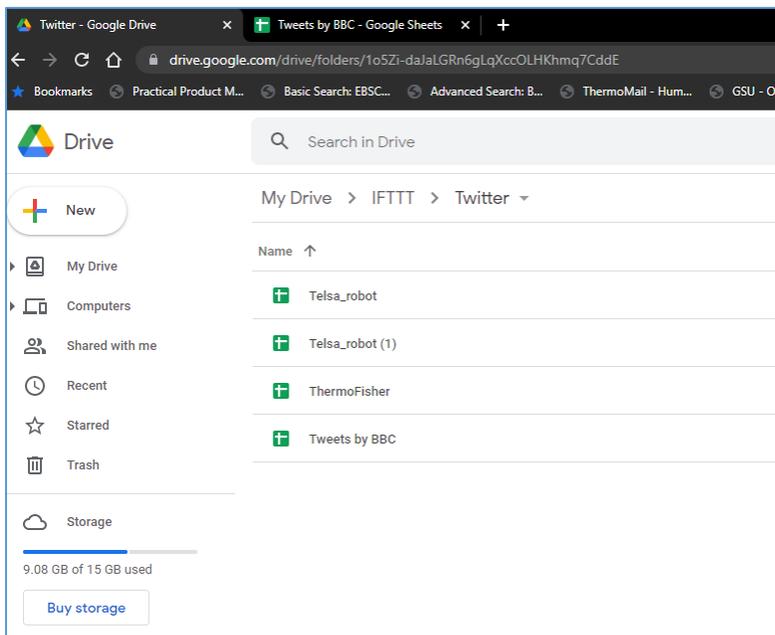
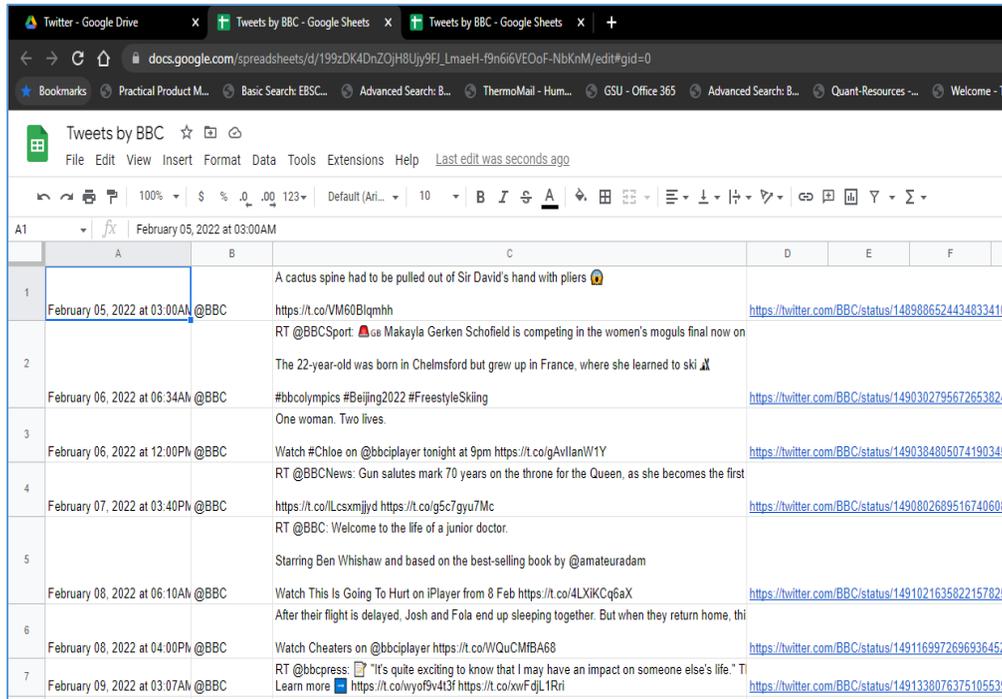


Figure 4

*Example of ITFFF.com Collection*



	A	B	C	D	E	F
1	February 05, 2022 at 03:00AM	@BBC	A cactus spine had to be pulled out of Sir David's hand with pliers 🙄			<a href="https://twitter.com/BBC/status/1489886524434833410">https://twitter.com/BBC/status/1489886524434833410</a>
2	February 06, 2022 at 06:34AM	@BBC	RT @BBCSport: 🇨🇪 Makayla Gerken Schofield is competing in the women's moguls final now on The 22-year-old was born in Chelmsford but grew up in France, where she learned to ski 🇫🇷			<a href="https://twitter.com/BBC/status/1490302795672653824">https://twitter.com/BBC/status/1490302795672653824</a>
3	February 06, 2022 at 12:00PM	@BBC	#bbcolympics #Beijing2022 #FreestyleSkiing One woman. Two lives.			<a href="https://twitter.com/BBC/status/1490384805074190345">https://twitter.com/BBC/status/1490384805074190345</a>
4	February 07, 2022 at 03:40PM	@BBC	Watch #Chloe on @bbciplayer tonight at 9pm <a href="https://t.co/gAvllanW1Y">https://t.co/gAvllanW1Y</a> RT @BBCNews: Gun salutes mark 70 years on the throne for the Queen, as she becomes the first			<a href="https://twitter.com/BBC/status/1490802689516740608">https://twitter.com/BBC/status/1490802689516740608</a>
5	February 08, 2022 at 06:10AM	@BBC	Starring Ben Whishaw and based on the best-selling book by @amateuradam Watch This Is Going To Hurt on iPlayer from 8 Feb <a href="https://t.co/4LXIKCq6aX">https://t.co/4LXIKCq6aX</a>			<a href="https://twitter.com/BBC/status/1491021635822157825">https://twitter.com/BBC/status/1491021635822157825</a>
6	February 08, 2022 at 04:00PM	@BBC	After their flight is delayed, Josh and Fola end up sleeping together. But when they return home, thi Watch Cheaters on @bbciplayer <a href="https://t.co/WQucMBA68">https://t.co/WQucMBA68</a>			<a href="https://twitter.com/BBC/status/1491169972696936452">https://twitter.com/BBC/status/1491169972696936452</a>
7	February 09, 2022 at 03:07AM	@BBC	RT @bbcpres: 📺 "It's quite exciting to know that I may have an impact on someone else's life." T Learn more <a href="https://t.co/vyof9v4t3f">https://t.co/vyof9v4t3f</a> <a href="https://t.co/xwFjL1Rri">https://t.co/xwFjL1Rri</a>			<a href="https://twitter.com/BBC/status/1491338076375105539">https://twitter.com/BBC/status/1491338076375105539</a>

## Visualizations

We use a business intelligence platform such as Tableau to convert raw data into digestible graphics to create visualizations from the data collected in the above process. In addition, educators may apply for free licenses for themselves, students, and classrooms that are valid for one year. The request is made through Tableau for Teaching at the address <https://www.tableau.com/academic/teaching>. These licenses are renewable on request. Our choice to use Tableau for instruction was based upon the fact that Tableau makes its desktop software available free at <https://public.tableau.com> for registered users. The difference between the free general use license (GUL) and the paid license is that the GUL limits data connections to text files such as comma-separated values (CSV) and Microsoft Excel.

On the other hand, the full use, including education licenses, allows for the connection to dozens of database formats such as structured query language (SQL) and MongoDB. Other platforms, such as Microsoft's PowerBI, limit the overall function of the application itself. Therefore, many of the advanced functions available to the GUL Tableau package must be paid for in PowerBI and other platforms.

## **Processing**

To perform analysis in real-time without a deep knowledge of Python programming, Tableau provides an analytical extension to its desktop software called TabPy. However, users must first install a current version of Python before installing and using TabPy. The Python files and instructions are found at [www.python.org](http://www.python.org). The TabPy files and instructions are found at <https://www.tableau.com/developer/tools/python-integration-tabpy>.

TabPy is a utility that allows Tableau users to create a calculated field that passes data connected to Tableau to Python. Python then performs machine learning calculations and returns Tableau's results as a column of data for use in creating visualizations. Also, changes to the data can be performed *in situ* versus continuously reprocessing the data externally in Python and connecting the new data to Tableau. Though these visualizations can be created in Python's visualization toolset, they are static. Therefore, they cannot be connected to other information dynamically. The use of TabPy allows for a deeper understanding and ease of interrogation of the data by the user. The benefit of this approach is that a user does not need to know Python in-depth to produce results when using TabPy's pre-deployed methods. The descriptions and use of the pre-deployed methods can be found at <https://tableau.github.io/TabPy/docs/tabpy-tools.html>.

The pre-deployed methods used in TabPy reduce the code needed to produce the results versus the actual Python code needed to perform the same analysis. In the TabPy published method, the only reference to the column of data containing the text to be analyzed must be changed from dataset to dataset. The underlying code has been captured in a function that does not require the user to enter many lines of instructions. However, a more advanced user may create their own methods and Python scripts beyond the published methods if so desired.

## **Analysis**

First, to instruct in the foundation of sentiment analysis and interpretation, we will begin with the Airlines Sentiment dataset from Kaggle.com. The data contains information on whether the scores were positive, negative, or neutral. In addition, it contains the column of reasons for the negative review, derived from hashtags in the original text columns for negatively scored tweets. Also, a column containing the latitude and longitude of tweets is present. However, due to privacy settings, not all tweets have this information.

When considering analysis, a practitioner must determine if the coordinate labeled data is sufficient to determine insights by region. The use of sample size determination is encouraged for the inclusion of instruction to make this determination. Also provided are the date-time-stamp of the tweets and the number of retweets.

As seen in Figure 5, representing unfiltered data, four worksheets were made to be combined in one dashboard. First, we SUM the tweets and their sentiment to produce the overall sentiment of the analyzed period. In the example, we see that the proportion of negative tweets is far more significant than neutral or positive ones.

Next, we can determine the proportion of reasons for a negative review by constructing a word cloud from the negative reasons column. To create the word cloud, we create a Tree Map in a worksheet and then change the indicator type from box to text. The most prominent words are displayed as the leading reasons for negative reviews by the scaled size of the words. By adding color to the same column of data, the word cloud becomes easier to interpret. The example shows that discontent's most prominent negative reasons are lost luggage and late flights.

An interesting analysis point is the ability to see where a portion of the tweets is made. (Limitations to the availability of geographical data have been previously noted.) Using the columns of data with latitude and longitude, we can create a map of the Tweet origination points. By adding color and size to the negative reason column in this worksheet, we can determine the prominent negative reasons and their proportion in cities. The visualization also allows us to determine if the Tweets are created in areas served by the airlines. Many organizations monitor this type of information for fraud in social media.

Lastly, we construct a worksheet that plots the sum of Tweets and reTweets on a dual-axis over the analysis period. To this graph, we add the quartiles and average line to determine the average tweets per hour and the period where most tweets concurred during the period analyzed. The chart shows that eighty Tweets and six reTweets an hour occur during the six days of the complete data set. Additionally, we can see that the period where the social media traffic is highest corresponds to the end of the period analyzed, which corresponds to Sunday and Monday. These are typically heavy travel days for returning vacation getaways and business travel.

Adding a filter to the analyzed time shown Figure 6 allows us to observe changes to the dashboard and conclude sentiment and problematic issues during that period. In addition, this data limiting would allow hotspots and reoccurring matters to be determined. By using the technique in historical terms, airlines could find cyclical or seasonal patterns that could be addressed in overall operations planning. Airlines that use this technique in real-time would be able to assist customers by deploying social media communications in negotiating the issues raised in the word cloud.

Figure 5

*Unfiltered data from the Virgin Airlines dataset*

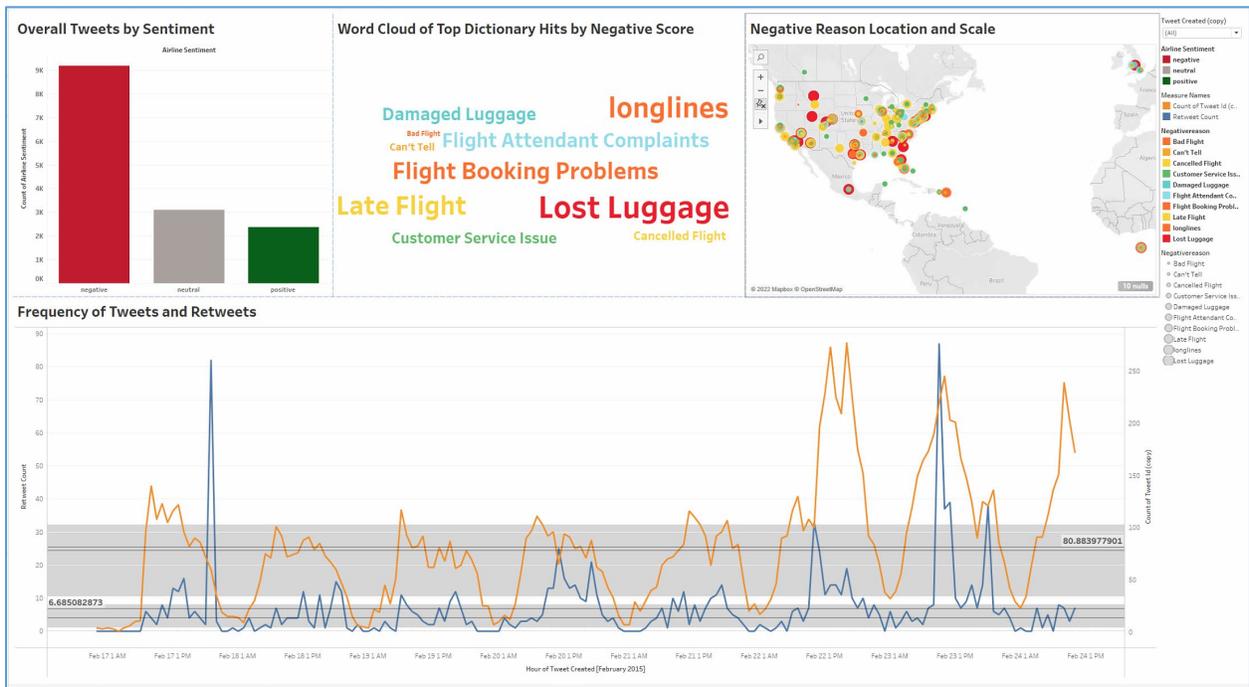
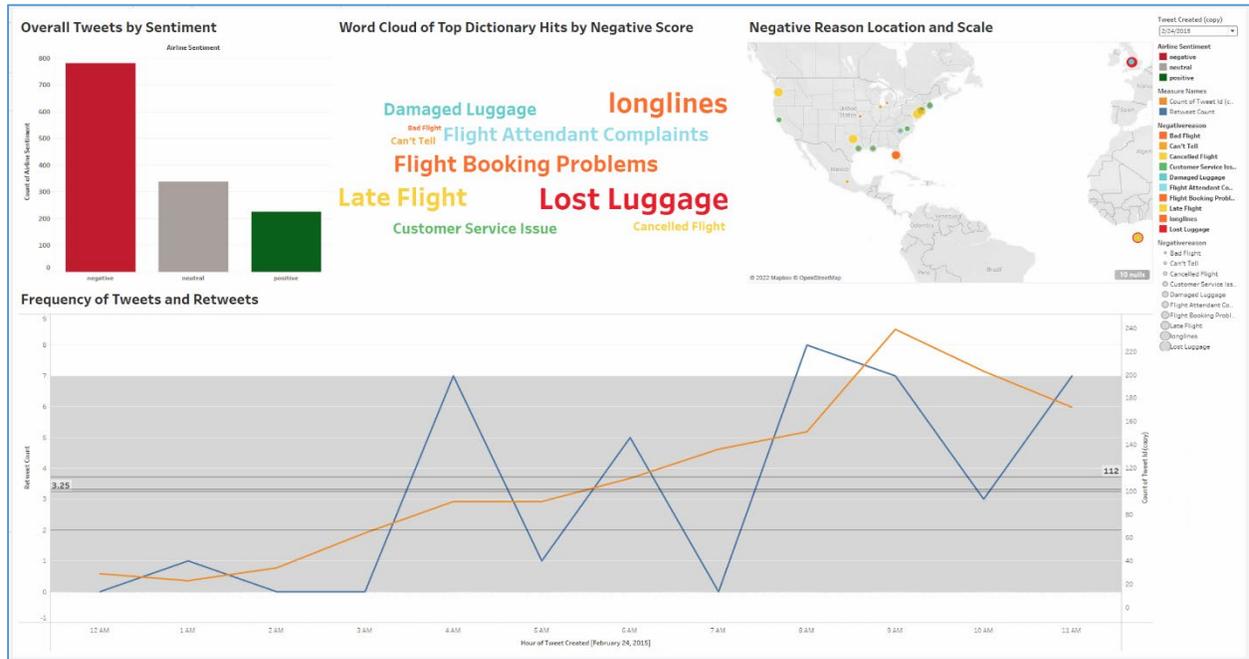


Figure 6

*Filtered data from the Virgin Airlines dataset*



In the data displayed in Figure 7, we perform the sentiment analysis of Amazon product reviews using the pre-deployed TabPy method for sentiment analysis using the VADER algorithm as its default setting. In the data, we find the column for the text, the date-time-stamp, and categories of the reviews. Also, the categories of the reviews are located in the file.

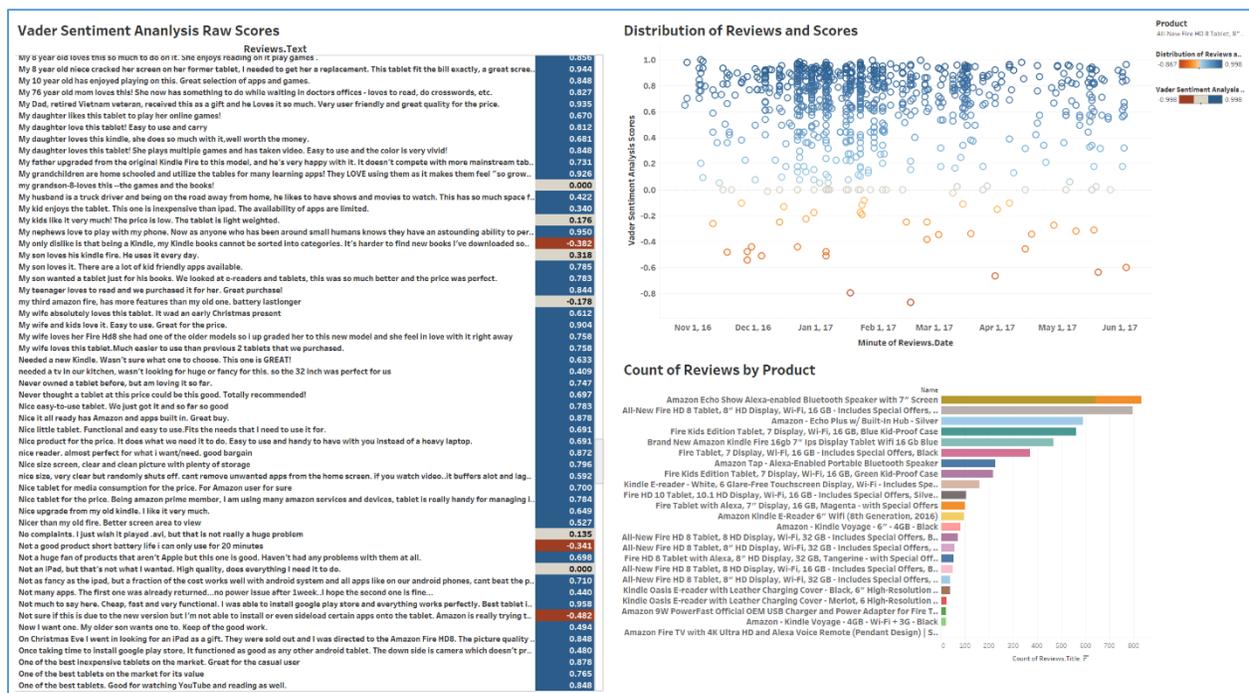
Once the data is connected to Tableau, we create a calculated field, using the TabPy sentiment analysis method, to generate the sentiment score for each review. Next, we construct three worksheets to create the dashboard. The first worksheet we create with the text of each individual Tweet and its calculated score. The score is then color-coded for positive, neutral, or negative context. The second worksheet displays the sentiment scores over time with a gradient

coloring to indicate the most positive to most negative in the course of a day with added tooltips that display the embedded information of product name, category, date and time, and sentiment score. This step allows the user to drill deeper for information displayed at the surface level.

Lastly, the third worksheet displays the proportion of each product in the total number of reviews. All worksheets are then connected and arranged in a dashboard as shown in Figure 7.

Figure 7

*Dashboard of Vader sentiment analysis of Amazon product reviews*



## Pedagogical Approaches in Business Communication

In a business communication course, the framework described in this paper could be included as a preliminary introduction to visual communication or data visualization. Students might prepare a report that analyzes and interprets the research and information in the dashboards to a targeted business audience with recommendations for improvement or product innovation.

Information contained in the report could also be used as a versatile basis for a business presentation; areas such as leadership or marketing would have different objectives and utilization of the same information.

As a next step in curricula development, instructors might allow students to choose from a small set of publicly available data and create their own dashboards using their previously acquired skills from the framework described in this paper. The process would extend the student's creative capabilities in analyzing data while again producing analytical reports and dashboard introductions.

Finally, in a more sophisticated use of the framework, students could gather data from social media sites or portals such as ITFFF.com. From the collected data, a final round of dashboard creation, analysis, and reporting should be done to demonstrate the skills acquired and refined during the course. This last assignment completes a skill required in business where raw, uncharacterized data must be completed for the analysis process for decisions to be made.

### **Conclusion**

The use of combined business intelligence tools and data analytics platforms to create a meaningful interpretation of data sets is a valued skill in today's business world. Through the use of connection tools such as TabPy, the dynamic use of data becomes exponentially easier for the non-technical practitioner, both student and instructor. Tableau and TabPy offer plenty of online support for these technologies, making it possible for educators to incorporate these tools into their classroom environments.

Incorporating business analytics into business communication courses not only introduces students to the fundamentals of data analysis and stimulates critical thinking skills, but also helps

them understand how data collection can create value for businesses and influence strategic and organizational change with regards to processes, products, and services. More importantly, perhaps, the knowledge of business analytic tools, and visualizing and interpreting data, is a valuable skill set that also effectively prepares students for the data-driven, corporate culture of the 21<sup>st</sup> century.

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## **GMetrix: Is There an ROI?**

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### **Abstract**

With the increasing costs of attending college, is the additional expense of the test preparation tool GMetrix worth the investment for post-secondary college of business students? Does using this tool increase the likelihood that the student will pass the required Microsoft Office Specialist (MOS) Certification Word 2019 Exam? We sought to determine the answers to these questions in order to determine if the faculty of a rural four-year university should continue requiring the purchase of the GMetrix test prep tool. Findings are reported in aggregated form using descriptive statistics.

Keywords: *Microsoft Certification, MOS, Word, GMetrix*

## **Introduction**

As the cost to attend college continues to be ever-increasing, faculty are often tasked with finding ways to help reduce expenses allocated to students. The School of Business (SOB) within the College of Business & Technology (COBT) at a regional, four-year public university in Louisiana offers AACSB accredited programs in Accounting, Business Administration, and Computer Information Systems. A large cross-section of the students that attend this university are economically disadvantaged. In recent years, encouraged by students, higher education administrators, and government officials, the SOB faculty has been seeking ways to address rising costs across the university without causing the students to be without needed materials.

The School of Business (BUAD) at this university has also been investigating means to help their students earn degrees by eliminating obstacles that may lengthen the time to graduation. Books and fees continue to be some of the greatest financial roadblocks to graduation that fall directly on the students themselves each semester. This study examines whether the additional cost associated with a test preparation tool, GMetrix, provides a return on investment for students in the SOB's introductory computer applications course, BUAD 1800 - Introduction to Information Technology (Stauffer, 2021). GMetrix is a Skills Management System and provider of testing technology that allows users of the application to take practice exams for information technology (IT) industry certifications in a concurrent or simulated environment (GMetrix, 2017). At the conclusion of this course, students are required to take the Microsoft Office Specialist (MOS) Certification Exam for Word 2019.

For the purposes of this study, a return on investment would indicate the students successfully passing the MOS exam after using GMetrix with a passing score of 700 out of a possible 1000.

## **Problem**

With the increasing costs of attending college, is the additional expense of the test preparation tool GMetrix worth the investment for SOB students? Does using this tool increase the likelihood that the student will pass the Microsoft Office Specialist (MOS) Certification Exam for Word 2019?

The purpose of this study was to try to answer these and other related questions by altering the time of delivery of the GMetrix product to two classes of BUAD 1800 - Introduction to Introduction Technology students. All students completed the course assignments offered through the “Exploring Series” of *MyLabIT* from Pearson Education, but the MOS exam was administered to one of those classes before they had the opportunity to use the GMetrix test prep tool. Objectives of the study were: (1) to gather and report information about the students’ scores on the MOS exam with and without the use of GMetrix, and (2) to compare those students’ retake scores with their first score once they have received the GMetrix training, and finally, (3) to determine if the faculty should continue requiring the purchase of the GMetrix tool.

## **Background**

The initial research for this study found that while there are many studies related to using the GMetrix test preparation tool as a predictor of success for the MOS Excel exam (Pharris, Tarver, & Penrod, 2018), there are very few measuring the success of the tool for the MOS Word exam. Related scholarly research for this topic primarily focuses on indicators associated with student demographics, such as the socio-economic and socio-cultural background and academic preparation of the student.

In 2015, the SOB’s faculty implemented a requirement that all students taking the BUAD 1800 - Introduction to Information Technology class be given the Microsoft Office

Specialist (MOS) certification exam for Word as the final exam in the course. Though passing the exam was not mandatory, taking the exam was required. This class was specifically tailored to prepare students for taking the certification exam at the end of the semester and implemented the use of the GMetrix test preparation tool to help them be successful in obtaining a passing score of 700.

The way students have purchased the GMetrix test preparation tool has changed since it became needed for BUAD 1800. Originally, faculty required students to buy GMetrix themselves as a single license or a suite at the cost of \$40 - \$120. As of Fall 2017, students paid a lab fee of \$120.00 that incorporated the cost of both the certification voucher and the GMetrix license.

In response to the voiced concerns about the prohibitive materials costs, the department invested in a GMetrix site license. In doing so, the departmental faculty incorporated the cost of GMetrix into the course fees. Thus, the costs for each student in the class is currently \$228.25 of which approximately \$40 is the GMetrix license. The cost of the course led investigators to question if these added fees were worth the potential increase in student success.

Industry partners and employers have expressed interest in certifications, including the Microsoft Word certification, for graduates of the university's business program. The BUAD 1800 course is the first certification class taken by students in the program. The SOB faculty also sought to validate whether the students were learning the needed skills to pass the MOS Word certification exam using the test prep tool GMetrix.

Business and industry have made certification an important qualification for employment, where often an employee is required to have a certification at the time of hire, or employees must

obtain certification upon hire (Schlichting & Mason, 2004). IT hiring managers have used certification as a differentiator between job candidates with similar levels of experience, and salary surveys have shown that certified employees are compensated at a higher salary than non-certified employees are compensated (Hunsinger & Smith, 2008).

Currently, a great need exists for certified Information Technology professionals in many areas of the workplace. As the university prepares students for employment in areas requiring certifications, it is increasingly important for those educational institutes to provide adequate and effective training through the course work offered.

This study focused on recent high school graduates who entered a regional public university as freshmen in the Fall 2021 semester. This study was an attempt by SOB faculty to help reduce the cost of the introductory computer applications course in the curriculum - BUAD 1800 - Introduction to Information Technology. In higher education, wasteful activities are those that add cost, but do not add value to the customer. According to the ideals of continuous improvement, specifically the Lean methodology, if an activity is adding cost, but is adding no value, practitioners should eliminate those activities (Zhou, 2016). This effort focused on whether requiring students to purchase a GMetrix code is a necessary expense to ensure passage of a MOS Word certification exam.

This study will help the faculty determine whether the cost of the GMetrix Prep tool is providing a good Return on Investment (ROI) in the form of more success with the students passing the MOS Word certification exam. The findings will help SOB faculty to determine whether they will continue to require students to purchase this additional class add-on in the future.

## **Instrument**

The instruments used for the study were the GMetrix test preparation tool and the Microsoft Office Specialist Word certification exam, offered through Certiport. A short Google form survey was also created to gather basic demographic information about each student. A copy of the survey used for the study can be provided upon request.

## **Population**

The accessible population was 59 students enrolled in two face-to-face sections of the introductory computer applications course BUAD 1800 during the Fall 2021 semester. Of the 59 enrolled students, a total of 52 were given the final MOS Word certification exam. Of those, 51 or 98% graduated high school in the Spring of 2021. The other 1 student graduated in 2020. Seven students did not complete the course.

The students were enrolled in two sections of BUAD 1800 for the Fall semester of 2021. Classroom A (Section 02) was used as the control group. The data for 25 students in this section was examined. Classroom B (Section 03) was used as the experimental section. Twenty-seven students in this section were given the exam twice - once before GMetrix and once after. The data for these students was extracted for comparison purposes to conduct this study. The students that did not complete the final MOS exam were not included.

## **Methodology and Data Analysis**

During the Fall of 2021 those university students enrolled in the university's School of Business freshmen Introduction to Information Technology course (BUAD 1800), sections 02 and 03, were analyzed.

In this exploratory study, the data was collected by the instructor of the two courses. Students in two face-to-face BUAD 1800 courses were instructed by the same instructor through

the first six chapters of the *Microsoft Office 365 Comprehensive Word 2019 Exploring Series* by Poatsy. The book is published by Pearson Education. The students used the *MyLabIT* learning program associated with the textbook. The study was conducted during the Fall 2021 semester.

After approximated 10 weeks of instruction students in Classroom B (Section 03) were given the MOS exam in class during a regular class period. These students had only completed assignments from the textbook and simulation tool. Scores were recorded on the MOS Word 2019 exam. The students were then given the GMetrix codes and assigned five practice exams. They were then retested during the last week of the semester.

Students in Classroom A (section 02) completed 10 weeks of instruction and were given the access codes for GMetrix. They were not tested until they completed five (5) practice GMetrix exams. Testing was completed during the last week of the semester. Some demographic data was also collected. The scores were downloaded into an Excel spreadsheet for analysis. For this exploratory study, the findings were reported using descriptive statistics in the form of bullet points. Some demographic data was also reported.

Students in both sections also completed a short Google form survey about their history with this type of course and past Word certification exams. Data was analyzed to answer the specific questions of this study.

## **Findings**

Classroom A (section 02) students completed all assignments from the textbook after approximately ten (10) weeks of class. These students were presented with the codes for GMetrix and were instructed in how to complete the exams. Five exams were assigned. Students were given the MOS Word certification exam during the last week of the course. This exam counted at the final for the course. Thirty (30) students were enrolled in this section. Twenty-five

(25) students took the final exam, while five (5) students did not take the final exam or use the GMetrix code provided. Overall, this section of students had a lower final grade average than the students in Classroom B, indicating that they were overall academically a weaker class.

Overall results from Classroom A, were as follows:

- 25 students took the final exam during the last week of class - after they had been given the opportunity to complete the 5 practice exams on GMetrix
- 16 (64%) of the students passed the exam with a score of 700 or better
- 9 (36%) of the students did not pass the exam with a score of 700 or more
- Of the 9 students who did not pass the exam, a further look at the data revealed that 6 of the 9 did not attempt the GMetrix assignments. The other 3 only partially completed the assigned exams.
- 100% of the students that passed the MOS word exam did complete the GMetrix assignments.
- Overall average for the class for the final exam was 660
- Average score for those passing the exam was 804
- Average score for those failing the exam was 372
- Highest score was 914
- Lowest score was 166
- Overall class final grade average was 69%

Classroom B (section 03) students completed all work from the textbook at approximately the same time as the students in Classroom A. However, on the day the students

in Classroom A received their GMetrix codes, the students in Classroom B were given the MOS exam. The students had no prior knowledge that they would be tested and only the students present on that day were given the MOS exam. Scores were recorded. The students scoring over 900 were not required to complete the GMetrix assignment and their first MOS score was used as their final. Students scoring 899 and below had to complete the GMetrix homework and retake the MOS exam.

Overall results from Classroom B from the first attempt were as follows:

- 22 students were present on the day of the first MOS exam. Six students were absent on that first test day.
- Of the 22 students attempting the MOS exam before the GMetrix exercises 15 (68%) did pass the exam with a score of 700 or better. Two students scored over 900 and were then exempt from having to complete GMetrix exams. Seven students (32%) scored below 700.
- The overall average score for this first attempt was 683.5
- The average score for the students passing was 793
- The average score for the students failing the first attempt was 450

Overall results from Classroom B from the second attempt are as follows:

- 27 students received final grades in this course
- 24 students tested on the second attempt day. The second attempt was given after the students were allowed the opportunity to complete 5 practice exams in GMetrix.
- 3 students elected to use their first attempt as their final grade for the MOS exam and did not attempt a retest.

- The overall average score for the final attempt was 760
- 19 students passed the second attempt with an average score of 814
- 5 students failed the second attempt with an average score of 411
- 3 of the 5 students that failed the second attempt did not complete any of the GMetrix assignments.
- Highest score was 914
- Lowest score was 266
- The average for the exam increased from 683.5 to 760. There was a 36% increase in test scores when comparing first attempt to second attempt.
- Overall class final grade average was 85%

#### General information

- Even though 15 students did pass the exam on the first day, without the aid of GMetrix, there was a 36% increase in scores when those students retested.
- Six of the students in Classroom B already had MOS certification in Word 2013 or 2016.
- Seven of the students in Classroom A already had MOS certification in Word 2013 or 2016.

#### **Conclusions**

Based on the results of this exploratory study, a difference does exist between the first score on the MOS exam and the second score on the MOS exam for classroom B. However, other causes, such as pre-existing academic success and prior instruction through high school courses, cannot be excluded as the cause for higher scores on the MOS exam. A positive return on investment does seem to be indicated for the usefulness of the GMetrix exam in increasing

scores on the MOS exam, but it is not conclusive. If only looking at the increase in test percentage, then a 36% return on investment looks good, and is a reason to continue with the required GMetrix purchase for students.

### **Implications for Future Research**

Given the results indicating some support for the expense of the GMetrix exams, but a lack of a clear answer, a need for additional research is apparent. Researchers will conduct additional experiments comparing students who took the MOS Word Certification exam without GMetrix practice exams with students who take the exam after they have completed the assignments using the GMetrix test prep tool. It is hoped that two more similar populations could be found to repeat the experiment in future semesters. The two sample classes used in this exploratory study were not as similar as one would like for them to be, with a wide variety of demographics being present in the population.

Since one of the two groups will have had “practice” taking the exam, researchers would need to work out the ethical concerns of excluding a group of students from a practice material. The ability to conduct a true experimental study with a control group and an experimental group would provide additional clarity to the research questions in this study. Given these internal ethical concerns, one avenue of future research may be to compare the results with other universities who require the MOS exam, but do not require GMetrix.

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## **Using a Reflective Class Project to Build Student Resiliency**

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### **Abstract**

Building resiliency in students helps them become better learners and employees. With this in mind, this project uses a class reflection activity to promote self-efficacy. Via a convenience sample, students were asked to reflect on their performance on a specific assignment, acknowledge their own shortcomings, and recommend how other students could improve. The study results show that students recognize they need to spend more time preparing for their studies to improve their own performance and indicate a willingness to do so.

*Keywords:* resiliency, communication, student success, reflection

## **Using a Reflective Class Project to Build Student Resiliency**

The year 2020 brought on a series of changes to higher education that will likely impact business schools for many years. From a sharp increase in online offerings, a proliferation of remote work, concerns of supply chain shortages, and rising prices, rapid changes have occurred. It seemed like the world became completely virtual in March 2020 as people were forced to find ways to conduct work, school, and social activities in an online format. These changes caused stress and anxiety and a lack of engagement for students with their coursework, instructors, and peers (Whiting et al, 2021).

### **Background**

The U.S. Government Accounting Office (2022) reported that the changes during the pandemic were detrimental to education. It found that in the school year 2020-21, public school teachers believed that 64% of their students made less progress than during pre-pandemic times. Students in high school grades seemed to fare worse than those at lower levels, as only 7% of teachers believed that at least some of their students performed below grade level. This statistic is significant because these students will likely enter universities in the coming years. As educational institutions attempt to move forward to a "new normal," it is likely these students will struggle as they must learn to adapt again.

Resiliency is the ability to return to normal, or bounce back, from a difficulty much like our students have experienced in the last few years. Teaching students to become resilient is essential to developing them to become successful workers beyond just learning the technical skills to get the job. Resiliency helps to build emotional intelligence, which can contribute to career success. Resiliency serves as a psychological buffer that helps people overcome differences, learn to adapt, and stay positive. When people have better psychological well-being,

they become more flexible to adjust to the fast-paced environments they will encounter in their careers (Waters, 2021). As the pandemic has continued well over a year, students and educators have needed to overcome many challenges in the learning environment. At the same time, businesses have adapted to remote work, new supply chains, and other forms of innovation.

These rapid changes will likely persist, which is why building resiliency in students helps prepare them for a demanding workplace: it is essential for business educators to learn how to adapt lessons to encourage resiliency. Teaching resiliency will help our students learn to adapt and endure for success in their professional, academic, and personal lives. One of the skills for which recruiters look with new hires is the concept of resiliency. Companies want employees who can overcome barriers and persevere when times are tough. One concern is whether this qualification can be taught to business education students.

Teaching resilience is not memorization and rote learning methods (Tocino-Smith, 2019). It includes engagement with the course material despite increasing time pressures to meet basic learning outcomes. Another obstacle to learning is that students bring their own problems that make the learning process more difficult. Some of these challenges can be attributed to family issues or prior experiences that may have sheltered them from "the real world" that may inhibit the ability to grow and overcome challenges on their own. When children don't have that chance, they begin to fear the unknown and learn helplessness (Tocino-Smith, 2019). Often, school systems have contributed to this phenomenon with policies that don't allow students to fail.

According to McWall and Wall (2019), "Resilience is key as career paths are no longer linear and professionals are at risk if they are not open to change, flexible and resilient. To adequately prepare for a professional career, students need to develop their critical analysis and

cognitive flexibility; therefore, enabling them to fail in a safe arena, such as a classroom, helps to develop their ability to critique and develop resilience and a positive attitude towards life-long learning." (p. 10). Failing will help build resilience through learning from mistakes and developing the capacity to improve themselves (McWall & Wall, 2019).

Building resilience in students is one way to build self-efficacy for the lifelong learning needed for professional success. Building in active learning activities in the classroom will help students build self-confidence in their own abilities through reflection on their experiences (Cornell et al, 2013). Reflection is a component of Experiential Learning Theory, which "invites you to understand yourself as a learner and empowers you to take charge of your own learning and development" (Institute of Experiential Learning, 2021). When students reflect on their performance, based on feedback provided, they can learn to take control of their learning by making changes in their learning behavior.

Resiliency is not a new concept. Originally introduced in business as the acronym GRIT (Growth, Resilience, Instinct, and Tenacity), GRIT is seen as one personality trait that makes the difference between success and failure (Zetlin, 2020). Resiliency is a main part of the idea, and it is important in the workplace. Resiliency serves as a psychological buffer that helps people overcome differences, learn to adapt, and stay positive. It acts as a psychological buffer for better well-being and flexibility in a dynamic business environment, which helps them to adapt to fast-paced environments. (Reeves & Whitaker, 2020). Teaching resiliency will help our students learn to adapt and persevere for success in their professional, academic, and personal lives.

## **Research Questions**

This study addresses the following research questions.

- What challenges did students face in their business communication and development classes?
- What did students gain from reflecting on their assignment performance?
- Based on their reflections, what do students recommend to their peers regarding these or similar assignments?

## **Research Design and Methodology**

The research design was qualitative in nature, and involved a convenience sample of students taking business classes at a regional comprehensive university in Spring 2021. Near the end of the semester, students were provided an extra credit assignment to reflect on one assignment during the course of the semester. Students were provided a small amount of bonus points for completing the assignment, but the amount given did not significantly impact the final grade for the course.

The student responses asked students to reflect on their individual performance on a specific assignment. Students chose one assignment they completed during the semester but did not score as well as hoped. Students responded to open-ended questions that asked for reflection on the mistakes they made and how they can improve in the future. A copy of the assignment is provided in the Appendix. Students typed responses in a Word document, which was uploaded to the university's learning management system (LMS) used for all course assignments.

All students enrolled in the course were provided the opportunity to complete the assignment. An announcement was posted on the home page of the class LMS, and students had

five days to submit their response. A total of 102 students were enrolled in the four courses, and 63 students completed the assignment resulting in a response rate of 61.8%. Using textual analysis, these responses will be presented.

### **Conceptual Framework**

This research explored the idea of students as a valuable source of information for two purposes: (1) informing faculty members on challenges that students may experience and (2) providing peer-to-peer (student-to-student) recommendations.

### **Results**

Data analysis was completed in two phases using Microsoft Office's Excel application to organize and code the data. Phase one involved reviewing survey responses to arrive at *in vivo* codes, which are derived directly from 'respondents' exact words (Yin, 2011). Phase two involved reviewing the phase one codes and grouping commonalities into categories based on meaning and/or implication. These resulting codes are presented according to the research question.

#### **Resulting Analyses by Question**

##### ***Question: In what way was this [assignment] difficult?***

Learning what elements of the assignments posed specific challenges to students is an important element in course revision and development. In their responses to the question, *In what way was this difficult? Be specific*, students described what challenged them. After an initial review of *in vivo* codes, summary codes were developed to create categories representing difficulties, as depicted in Table 1.

Table 1

*Students' Self-Reported Sources of Difficulty on Communication and Development Assignments*

<u>Responses</u>	<u>Frequency</u>	<u>Percentage</u>
business writing format	24	38.1%
paraphrasing and/or being concise	14	22.2%
guidelines or instructions	11	17.5%
something internal	11	17.5%
writing with a reader focus	4	6.3%
need more time to study	3	4.8%
attention to detail	2	3.2%
navigating library resources	2	3.2%
online format of class	1	1.6%

*Note.* Sample included 63 responses.

The most common challenge was using what can cumulatively be called "business writing format," as indicated by 38.1% of the students. This included, but was not limited to, writing in APA style, using professional word choices, and adhering to professional formatting. Similarly, and with some overlap, students indicated challenges with following written guidelines or instructions (17.5%); commonly, students revealed that they did not read or sufficiently understand the instructions and that they should have requested clarification or started the assignment sooner. Students also indicated struggles with being concise (not too wordy) and with paraphrasing (22.2%), as professional writing requires direct, no-frills composition. Finally, 17.5% of students indicated internal (specific to themselves) reasons for experiencing difficulties with the assignments; these reasons included procrastination, trouble deciding on a topic, being introverted, and being productive.

***Question: What skills did you have to use during the activity?***

Respondents were asked to describe skills that they exercised and enhanced in the chosen assignments. Identifying what skills students perceived that they learned in a class is a useful

exercise when considering where student areas for improvement might be (or might have been) and where an 'assignment's skills focus lies. This set of skills can also be helpful in allowing a faculty member to compare the intended skills focus to the actual skills focus. Table 2 details the students' self-reported skills gained from the assignments.

Table 2

*Students' Self-Reported Skills Gained from Communication and Development Assignments*

<u>Responses</u>	<u>Frequency</u>	<u>Percentage</u>
writing skills	13	20.6%
paraphrasing and/or being concise	13	20.6%
professional/formal communication skills	11	17.5%
interpersonal communication skills	10	15.9%
organizing/formatting	9	14.3%
critical thinking skills	7	11.1%
research	7	11.1%
success skills		
reflection	3	4.8%
follow instructions	3	4.8%
memorization	2	3.2%
using feedback	2	3.2%
tech skills	2	3.2%
active listening	1	1.6%
test taking	1	1.6%

*Note.* Sample included 63 responses.

As expected, students reported that they used and learned about writing skills (20.6%), specifically grammar and structure rules. Respondents typically didn't include further detail on what they perceived as "writing skills," but based on feedback given on the assignments, we conclude that grammar skills most likely encompass subject-verb agreement, word choice, punctuation, and other rudimentary elements of writing. In the same frequency (20.6%) and related to the same item in Table 1, students reported that they learned how to be more concise

and how to paraphrase in professional writing. This figure was encouraging to the authors, as it indicated an area of difficulty and a subsequent skill learned.

Respondents also reported learning about communication skills. A general subdivision of this area occurred with responses related to (1) professional and formal communication skills (17.5%) and (2) interpersonal communication skills (15.9%). Included in the professional and formal communications skills code were responses related to using "respectful communication," maintaining a professional "mindset" while writing, and communicating in a business setting. Included in the interpersonal communication skills code were responses related to body language, eye contact, persuasion skills, audience-specific messaging, and emotional intelligence.

***Question: If you had to start it all over again, would you do anything differently next time?***

A key element of our survey instrument was encouraging reflection in the student respondents. In their responses outlined in Table 3, they suggested mostly reasonable and not surprising actions that may have earned them higher grades.

Table 3

*What Students Would Do Differently*

<u>Responses</u>	<u>Frequency</u>	<u>Percentage</u>
dedicate more time to the assignment	19	27.0%
understand the assignment	16	25.4%
better formatting	13	20.6%
focus on audience	11	17.5%
be more concise	9	14.3%
provide more details/make writing interesting	6	9.5%
focus on grammar	4	4.8%
not use template	2	3.2%
be myself	1	1.6%
set tone	1	1.6%
nothing	1	1.6%
submit correct file	1	1.6%

*Note.* Sample included 63 responses.

Twenty-seven percent of the students gave responses that indicated that they would dedicate more time to the assignment. These responses included starting the assignment earlier, practicing for presentations, and spending more time preparing the assignment before submitting it. Similarly, students indicated that they would also invest more effort in understanding the assignment (25.4%). This included reading the instructions, reading the instructions in more detail, asking questions (and doing so in advance of the due date), and reviewing any feedback provided to enhance the assignment's quality (and thus, the grade earned).

Enhancements in writing quality were also mentioned. Respondents indicated that focusing on better formatting (20.6%) per the 'assignments' instructions, writing with the audience in mind (17.5%), being more concise (14.3%) in their writing as indicated in the previous responses, providing more details to make writing more interesting and useful (9.5%), and focusing on proper grammar (4.8%) would be areas of improvement if they were to complete the same assignment a second time. Interestingly, being more concise (14.3%) and providing

more details to make writing more interesting and useful (9.5%) may be potentially at odds with one another. We interpret these responses as finding an appropriate midpoint between being direct and providing sufficient detail to communicate effectively in the task.

***Question: What advice would you give a student just starting this assignment? Be specific.***

Students provided recommendations to peers who may take these classes in the future. These responses can also be helpful to faculty designing instructions for or giving tips regarding assignments. Table 4 outlines these peer recommendations.

Table 4

*Students' Recommendations to Peers*

<u>Responses</u>	<u>Frequency</u>	<u>Percentage</u>
read and follow all instructions	26	41.3%
read all course materials	20	31.7%
be concise	15	23.8%
allow yourself enough time to do the assignment	15	23.8%
pay attention to formatting	10	15.9%
focus on grammar	8	12.7%
review your work	8	12.7%
provide sufficient detail	6	9.5%
outline main points before starting	4	6.3%
consider your audience	4	6.3%
general recording tips	3	4.8%
be professional	1	1.6%

*Note.* Sample included 63 responses.

The tasks of reading and adhering to all of the assignment instructions (41.3%) and reading all provided course materials before beginning the assignment (31.7%) are inherently important. While intuitive, these recommendations may best be received in a peer-to-peer format, meaning that encouragement from fellow students to read these important items could prove more effective than the same encouragement from faculty members.

Continuing in tandem with responses to previous questions, students recommended being concise (23.8%) and allowing themselves enough time to complete the assignment (23.8%). Specifically, some respondents recommended that their peers "do not rush," "don't wait until the last minute," and "give yourself plenty of time" regarding assignment completion timelines. Respondents also focused on giving ample attention to writing mechanics and structure with the suggestions of paying attention to formatting (15.9%), focusing on grammar (12.7%), and reviewing one's work for potential errors (12.7%).

### **Discussion**

According to the results of this study, coursework associated with professional communication addresses an important area of weakness in incoming business students. We explored what challenges students face in their business communication and professional development area classes. Respondents self-identified having difficulties adhering to business and professional formatting, word choice, audience focus, and general writing styles. They also exposed behavioral issues related to following instructions or guidelines, spending ample time on assignments, and using their resources effectively. While not novel in revelation, these findings underscore the importance of business communication and professional development classes in supplying guided experiences in which students can receive feedback and improve to better prepare themselves for the often-unforgiving workforce.

Respondents additionally self-identified skills in which the assignments encouraged development. They confirmed that these assignments emphasize writing and grammar skills, as well as precision and directness in writing, but they also indicated that they recognized important elements beyond the hard-and-fast mechanics of the assignments' requirements. Students recognized that they were learning formal communication skills, interpersonal communications

skills, and critical thinking skills. When students understand what they are learning, along with the nuanced secondary skills developed, they engage in a fuller and more relevant learning experience (Brookfield, 2015).

The reflection process required in the study instrument provided us an opportunity to understand how the students viewed their learning experiences. Students appeared to be honest in their responses, admitting their misgivings about understanding the assignments or about the time needed to do well on the assignment. These reflections obviously informed the advice that they would give to their peers (or to their future selves) taking the same or similar classes. The students were thorough in recommending their peers read and follow all instructions, read all the course content, be concise, dedicate enough time to do the assignment well, and other suggestions. While the suggestions were not unexpected in content, the general situational awareness of the students post-assignment following a moment of reflection proved powerful. In a time of change and upheaval, students demonstrated acute awareness in their learning experiences – a resiliency, if you will – that could easily inform their actions in future classes or on the job. This quiet and personal process of reflection, which were included via the survey, underscored the value of such an exercise in education with respect to future performance and approach to future tasks. This active learning reflection activity allowed for personal growth, which helps to build students' self-confidence in their own skills as advocated by Cornell, Johnson, and Schwartz (2013). In addition, helping students learn about their shortcomings, or sometimes their failures, is key to building resilience (McWall & Wall, 2019).

### **Limitations and Recommendations for Future Research**

Results from this study are limited in that they were collected from one university during one semester. Repeating the study in more classes during different semesters may yield different

results. However, the authors feel that based on their extensive teaching experience, these responses are representative of other student responses from anecdotal studies.

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## Appendix

Assignment: Each of your assignments in this class have been to teach you a specific skill or concept to help you succeed in your future career. Ideally, you would repeat a lesson until you have mastered it, but time constraints do not allow this. Just because you have "not yet" mastered the concept, does not mean you can't continue to push and learn more in order to improve. With this in mind, learning cannot take place without failures (or setbacks). So, what have you learned?

You have been provided feedback on each assignment completed in this class. The feedback was provided in a variety of ways: written on your submission, delivered in video, assessed on a grading rubric, posted in the Dropbox, or displayed in quiz results. Choose one assignment during the semester that you did not perform particularly well (this is not an assignment that you missed and didn't turn in). It can be a writing assignment, quiz, or discussion. Review the assignment instructions, your submission, and your feedback. Do not revise the assignment, but reflect on your performance.

Answer the following questions by typing your response directly below each question:

- Which assignment did you choose? Identify the name of the assignment from the grade associated with it.
- What grade did you receive for this assignment?
- What was the main purpose of this assignment? Be concise.
- What did you learn while completing this assignment? Be specific.
- In what way was this difficult? Be specific.

- What skills did you have to use during the activity? Had you used any of these previously?
- If you had to start it all over again, would you do anything differently next time? Be specific.
- What advice would you give a student just starting this assignment? Be specific.

**The Virtual Career Fair: An Engaging Simulation for Business Information Systems and  
Business Communication Students**

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**Abstract**

Career fairs help students network, practice interview skills, and even secure jobs while being cost-efficient avenues for companies to recruit new talent. During the COVID-19 pandemic, many career fairs moved to virtual platforms. This article presents the Virtual Career Fair Project where students practice with information systems and employment communication. The project integrates the principles of constructivist learning and reflection in a comprehensive, practical series of activities designed to echo the career-enhancing experience of the in-person career fair. Students gain experience and enhance skills related to virtual platforms, employment communication, presentations, and written communication.

*Keywords:* career fair, virtual technology, interview skills, employment communication

## **The Virtual Career Fair: An Engaging Simulation for Business Information Systems and Business Communication Students**

A college degree is often seen as “the minimum qualification for entry into the skilled labor market” (Delbanco, 2012, p. 11). To help students achieve the key to what Delbanco terms “economic competitiveness,” many universities provide a wide range of professional readiness programs and services through career services offices and programming, from resume development and interview outfit loan programs to interview practice and networking opportunities. One of the more popular and high-profile services is the on-campus career fair (Smith, 2014). Whether focused on specific disciplines (e.g., business) or open to all students, these career fairs are presented as an important and effective way to connect students with prospective employers.

Career fairs provide benefits to students and companies alike. For prospective employers, career fairs represent a cost-effective way to connect with a large number of qualified candidates (Gordon et al., 2014). Students see the events as a means to meet face-to-face with local representatives of companies in a wide range of industries as well as an opportunity to fine tune their speaking and interviewing skills (Smith, 2014). Even if connections are not made, the career fair is a low-risk opportunity to practice essential skills related to job market competitiveness: preparing and utilizing an effective resume, developing a strategy for interaction, persuasively delivering a pitch, effectively recognizing and answering interview questions, and verbally and nonverbally expressing interest, engagement, and immediacy.

Like many other in-person university services, on-campus career fairs were canceled or dramatically scaled down in the first year of the COVID-19 pandemic. As universities adapted to a second year (and third year) dealing with pandemic-related challenges, the traditional approach

to career fairs shifted as well. Profound changes to the workplace and workforce, also prompted by the pandemic, mean that students need the support of robust career services offices more than ever (Martin, 2021). This article presents an innovative approach to career fairs that retains the benefits of the pre-COVID, in-person model while maximizing the benefits offered by virtual communication technology and strategies. While this literature and the project we propose might be adapted to any discipline, we focus specifically on the benefits to business information systems and business communication students.

### **Background: COVID-19 and Subsequent Changes to Career Fairs**

In the first year of the COVID-19 pandemic, many career fairs were canceled or moved to online spaces (Maurer, 2020). The second year of the pandemic brought a variety of changes as well, including in person, online, and even hybrid career fairs; as we navigate the third year of the pandemic, many career fairs are still online and/or experimenting with alternative formats to the face-to-face experience (Meisenzahl, 2021; Smith, 2021a). On campus recruiting also moved online in 2020, and some universities plan to stay online to ensure health and safety for students.

Outside of the university setting, many companies are still actively recruiting through online job fairs. In industry, Ashford (2020) reports that recruiters are looking for recent graduates specifically at virtual career events. Early adopters included technology companies, healthcare organizations, and institutions of education (Maurer, 2020), but as the pandemic has progressed, more companies have adopted online recruiting strategies. Meisenzahl (2021) reports that while most fast-food chains are struggling to hire during the pandemic, Chipotle is being innovative with sign on perks, higher wages, and online recruitment. The company employed Discord, a group chat platform, for their career fair. Smith (2021a) reports that Amazon is looking to hire more than 40,000 workers, specifically in technology and corporate roles,

following its next virtual career day. Amazon hosted a successful in-person career day across six different U.S. cities in 2019, but in 2020, the company moved its career day to an online platform in response to calls for social distancing during a pandemic (Jibilian, 2020). In 2021, the company planned the Amazon Career Day to be a fully virtual event (Smith, 2021a).

Likewise, companies are now streamlining their interview processes in a virtual environment (Hankel, 2022; Maurer, 2021). Because there is less expense associated with virtual recruitment, companies are likely to continue using the recruitment strategies they adopted because of the pandemic for years as a new normal for recruiting (Maurer, 2020). In a recent Indeed survey of 1,100 U.S. employers, 93% of those companies who adopted online recruiting and interview methods because of the pandemic plan to continue their virtual interview practices (Maurer, 2021). Hankel (2022) argues that the virtual interview is the new resume, used as a screening tool; because virtual interviews are inexpensive, they are offered to more candidates, and are therefore much more competitive than regular interviews, requiring forethought and practice to ace.

The shift from in-person to virtual career fairs, recruiting, and interviewing poses a particular issue for students in technology and business fields. To start, it has drastically increased the importance of “soft skills,” defined as behaviors, habits, and character traits that enable individuals to “navigate their environment, work well with others, perform well in teams, and achieve their goals with their hard technical skills” (Walker, 2020, p. 30). These behaviors and traits include such skills as communication, teamwork, courtesy, flexibility, and professionalism (U.S. Chamber of Commerce Foundation, 2018; Walker 2020). Having strong soft skills has always increased a person’s employability and also positively impacted their long-term career success (Karimi & Pina, 2021; U.S. Chamber of Commerce Foundation, 2018).

However, the lack of immediacy inherent in digital environments can muddle interpersonal interactions and relationships (Walker, 2020). The physical and psychological distance experienced in online career fairs, interviews, or remote offices requires students to be hyper-aware, for example, of how they manage their appearance, take turns in conversations, handle their camera and microphone, deal with unexpected technology glitches, and even maintain eye contact (with the camera, not the face on the computer). These complications particularly impact students in technology and business fields, for they struggle more with soft skills than students in other areas (Dixon et al., 2010; Karimi & Pina, 2021). The Virtual Career Fair (VCF) Project is particularly useful for helping business and information systems students develop the kinds of skills needed to be more employable as they embark on their careers – and also more successful as they progress in those careers.

### **Building Skills in the Online Environment**

The VCF Project builds on skills business communication and information systems professors already taught in the classroom setting: elevator pitches, interviews, and career fair preparation. For example, business communication and information systems students already learned how to write an elevator pitch or professional introduction, how to prepare for questions in an interview, how to ask questions about a company during an interview, how to demonstrate interest in a company, how to prepare a resume for a career fair or interview, and how to professionally dress during recruiting events. This project builds on those skills by shifting them to the online recruitment environment.

Maurer (2020) claims that users engaging in online recruiting need to be familiar with both chat technology as well as teleconferencing best practices. Kate Ashford (2020), a recruiter for Monster, explains essential skills all students need for virtual recruitment events. First,

students should familiarize themselves with the technology and practice teleconferencing etiquette. Candidates should always download the application or platform early and familiarize themselves with key features, including, but not limited to, how to turn on and off their microphone, how to turn on and off their camera, how to use the chat feature, and how to share a file through the platform. Recruiters will expect candidates to have their cameras on, mute when they are not speaking, use correct grammar in the chat, and share their resume (Ashford, 2020; Jibilian, 2020; Smith, 2021a); while these are all easy tasks, a lack of familiarity with the platform can make each of these tasks more difficult and potentially stressful.

Second, students should prepare and practice their digital presence. Ashford (2020) explains students need training to establish a professional background and a space free of distraction for online recruiting events. Not only should students present a tidy and professional background, but they should also keep the surrounding space clean in case the camera is moved. First impressions are essential at any recruitment event, but especially so when personal space is visible. In addition to staging for a virtual recruiting event, students should maintain first impressions through good posture, consistent eye contact, and professional clothing (Hankel, 2022; Maurer, 2020). Whether you are interviewing in person or online, recruiters are making decisions every second about a candidate's qualifications based on appearance, posture, and eye contact (Hankel, 2022; Smith, 2021b). Students should receive training on how to meaningfully make eye contact through a webcam and how to dress professionally when the camera will only capture part of their physical appearance. Ashford (2020) recommends that students record a test run of their professional introduction to evaluate their performance for areas of improvement prior to the recruitment event.

Third, students should help the recruiter remember them by doing their research, tailoring their documents, and practicing their pitch or introduction (Ashford, 2020). Even though there is an opportunity for a candidate to meet several recruiters at a career fair, they should still be familiar with the companies they will engage with; Amazon recruiters expect a candidate to know about the job for which they are applying (Smith, 2021b). In addition, Ashford (2020) emphasizes the potential connection you can create when you know about the company and its values, so students should research the company's culture, corporate values, mission and vision statements, philanthropy, and/or other value systems; demonstrating familiarity with the company helps a candidate stand out. Amazon specifically has candidates engage in one-on-one conversations, demonstrate skills related to the job, and share their resume, which they expect to correspond clearly to the job for which the candidate is applying (Jibilian, 2020; Smith, 2021a), so students should prepare their resume for each potential opening prior to the event. Students should also practice their pitch or introduction without assuming their name and credentials will be visible to the recruiter. Ashford (2020) encourages students to speak even when it is not required, share their name, the name of their school, when they expect to graduate, and their fit with the company. Maurer (2020) explains the impact of a strong first impression at a virtual event can create more opportunities than at an in-person event. In a virtual setting, recruiters are already on their computers with access to the application portal and internal scheduling software, so a recruiter can schedule the next step in the process immediately for candidates that make strong first impressions.

Fourth, students should develop a meaningful connection with the recruiter (Ashford, 2020). The one downside in a virtual environment is the lack of face-to-face immediacy that can be established during an in-person event (Maurer, 2020), so students need to be aware of

strategies to build immediacy through a webcam or chat platform. Amazon Senior Recruiter, DJ Cabeen, explains that candidates can find common interests with a recruiter (e.g., hobbies) to develop a personal connection (cited by Smith, 2021b). Additionally, something as simple as consistent, meaningful eye contact can help a candidate connect with the recruiter (Ashford, 2020). Familiarity with the company, as mentioned above, is another important point of connection (Jibilian, 2020; Smith, 2021a). Finally, Ashford (2020) explains that students should send a personalized thank you to the recruiter through the recruitment platform (if possible), through social media, or via email to create one last meaningful moment. As such, the VCF Project was designed to engage students in career preparedness for both in person and online recruitment and networking events.

### **Method**

The VCF Project is underpinned by the principles of constructivist learning theory. In the constructivist view, learning is active (i.e., based on real-world experiences), socially constructed (i.e., involves interaction with other learners as well as a guide or teacher), and personal (i.e., built on learners' previous knowledge and integrating their current skills and perspectives; Arends, 1998; Elliott et al., 2000). Effective learning is an iterative process that begins with a hands-on or practical action, incorporates reflection on the action as well as the students' learning processes, and encourages application of the new learning in other situations (Kolb, 1984; Fenwick, 2001). The VCF integrates all of these principles in a comprehensive yet practical series of scaffolded activities designed to echo and build on the valuable and career-enhancing experience of the in-person career fair. During this project, students practice four skills to prepare for online recruitment situations: developing and delivering a professional and

strategic introduction, responding to recruiter questions, designing a resume as an accompanying visual, and preparing a professional image and space.

### **The Virtual Career Fair Project: Assignments**

The VCF Project is a series of three assignments, which are summarized below. The complete rationale, descriptions, and instructions for the project are included in Appendix A.

- **The Resume:** Students will prepare a professional resume, which is often an expectation at career fairs, as a visual component of their accomplishments and a supplement to the pitch. Students complete the resume document first, so the information on the resume can be properly integrated into their pitch.
- **Elevator Sketch and Strategy Statement:** Students will next complete a sketch or plan for their pitch, which can be practiced in preparation for delivering the pitch. The pitch should make reference and draw attention to the resume as accompanying visual support. Students then complete a strategy statement about what was included in the sketch to explain their choice of content and how it meets their persuasive goals.
- **Presentation and Q&A:** The final step is the Virtual Career Fair Simulation. Students deliver a live professional introduction through Zoom, seated in front of their computer or webcam. The pitch should be delivered in a conversational manner, without notes, and should be 45-90 seconds in duration. The pitch should communicate who they are, their unique experiences, and potential contributions to a company of their choice. Students should upload their resume through the chat on Zoom and reference it at least once during the pitch. Following the pitch, each student is evaluated on how they answer at least one interview-style question pertaining to their professional introduction.

## **Results of the Virtual Career Fair Simulation**

The assignments were implemented over three semesters: fall 2020, fall 2021, and spring 2022. Three sections of a sophomore design and presentation of business projects course, approximately 95 students, participated in project development, design, and completion. Based on both assessment and student reflections, the students gained essential skills from the assignment, and they expressed appreciation for the opportunities the project provided.

### **Skill Development through the Virtual Career Fair**

Students improved four major skills through their participation in the project. The first skill students mentioned was learning how to navigate, utilize, and remain professional on a virtual platform used in recruitment and everyday business. The following student reflections illustrate the importance of this skill to the students.

I believe I gained presenting experience in an online space. I will have more confidence in Zoom interviews in the future.

This assignment will help me be professional in the future by showing me how to be professional through using Zoom – like sending a resume file while looking at the camera – because that is not something I’ve had to do before.

It is a great hands on experience for any student that is coming into the business world and needing to learn how to prepare for everything being online.

Our students used Zoom, but the VCF assignment can be adapted to any virtual platform (e.g., Teams, Bluejeans, Discord, Skype for Business).

Second, students were grateful they had the opportunity to improve their employment communication skills, especially as it related to career fairs, interviews, persuasion, and talking to recruiters and managers. The following student reflection excerpts demonstrate what students gained for future career fairs and interviews:

From this assignment I gained knowledge on how to conduct myself at a career fair. What questions to expect to answer and how to go about answering them. Also what questions an interviewee would ask a recruiter.

I've gained the confidence to know myself and how to better form an answer using the STAR method. Learning the STAR method has tremendously helped me and just the assignment itself has opened me up to a new way to look at interviews.

This assignment gave me a realistic look at what interviews will look like in the future. I have very minimal experience with interviews, and they make me quite nervous. So through this project, it gave me something to base myself off of and try to improve myself while also learning the finer details of the interview process and what to expect. It taught me applicable skills that I can directly use in my professional future especially when looking for internships or jobs.

An essential employment communication skill related to career fairs and interviews is persuasion, or how to frame/tailor previous education and experience for a recruiter. The following excerpts from student reflections highlight why students were grateful to learn how to frame their education and experience in a persuasive manner for future career fairs and interviews.

I think I gained a lot of insight from this experience because I have been through numerous interviews but that is when they are asking you questions because you have already caught their attention. In a career fair they do not know anything about you, and it is your goal to persuade them that you are a worthy candidate and reveal a little bit about who you are as an individual.

This assignment will help me to become a better professional in the future because it allowed me to gain a better understanding of the importance of presenting your accomplishments and experiences in an interview or to an employer. Now, I know how to explain and speak about my past job experiences and education while including job specific activities I was involved in.

Third, the students improved their presentation skills over the course of the project by becoming more mindful of their verbal and nonverbal behaviors as well as image management. The following reflection excerpts demonstrate specific verbal presentation skills students gained from the presentation portion of the project.

I think it will help me with my speaking and sounding more professional. I feel like I mumble a lot and I need to learn to enunciate more and speak clearly, and I believe this project helped me do that.

This assignment helped me become a better business professional by helping me talk to people that are in hiring roles. I am not a real strong speaker when it comes to talking to people, but this assignment gave me the confidence to speak.

Additionally, the following reflection excerpts demonstrate specific nonverbal and image management skills students gained from participation in the simulation.

I learned that eye contact through the camera is very helpful and will help you in the long run.

It's taught me some of the things I need to know about presenting myself as a professional behind a *camera*. I feel this will help me follow up in future in anything that requires my face to be made visible!

I will use all the knowledge I've learned, like physical appearance and appropriate business attire for a job interview, using facial expressions and gestures that are appropriate and convincing.

The fourth skill students mentioned was written communication skills, specifically learning how to prepare or edit a professional resume and how to craft a convincing and persuasive professional introduction/elevator pitch. The following reflections illustrate the importance of writing out an elevator pitch for the students.

I learned how to present myself in a more professional way for an interview or a career fair in terms of writing out and describing my experiences and education.

This assignment helped me prepare an elevator sketch that I can use in the future and edit / improve as I need.

Students were even more excited to create or improve their resumes. The following excerpts from the student reflections illustrate how important resume writing skills are to the students.

I had no prior knowledge on how to build resumes. What will help me the most with my professional goals is how to build a resume. I found it insane how much I didn't know about resumes, and comparing the resume I made myself with no knowledge about all the rules, and with the resume I made now, have very big differences.

I thought my resume was better than it was. That was a little embarrassing, but I am glad I received the feedback so that I can correct it. This could be the difference between getting an interview and not getting an interview.

Overall, students expressed gratitude for the above-mentioned skill-building, and similarly, were excited about the opportunities the project afforded.

### **Additional Opportunities Afforded by the Virtual Career Fair**

Students also recognized that the assignment provided them with three valuable opportunities. The first opportunity students mentioned in their reflections was the ability to practice all of the above-mentioned skills together, like a full practice run at gaining employment or an internship, rather than each skill in isolation.

This assignment will help me become a better business professional in the future by teaching me how to build professional resumes, build elevator pitches, and help me better answer questions and answer in moments on the spot.

This assignment helps students (A) see both spectrums of an interview process; (B) get a feel for an interview for a job they have never had to interview for; (C) understand the real world; (D) I build a resume they can offer and actually use it too.

Second, students were grateful for this simulation because they were able to make mistakes and learn from them without losing an internship or job. The following excerpts from student reflections highlight the opportunity to learn from their mistakes during the project.

It was a new experience for me, and now that I know how it works, I will be less nervous. Especially after seeing the recording, I know what I must change and improve.

I think this assignment showed me a baseline for where I am at, and where I need to be in order to be successful in interviews so that I can have more promise when applying for jobs.

Even though it was nerve wracking and made me super anxious, it was a good thing that this was my first experience at a “career fair” instead of embarrassing myself in front of recruiters that I would want to impress in hopes of getting an internship.

Finally, the students were excited for an opportunity that would encourage them to think about their future after college. The following excerpts show their excitement for an assignment that was career focused with immediate real-world application.

I highly recommend that this assignment is kept for future students, because students that are not experienced in the professional world will have a head start at how they can present themselves to future employers.

There was a lot of information and helpful tips that I didn't know before that I think is applicable and helpful for my future when I do more interviews. Also, it forces me to really start thinking about my future and having to start looking for internships, which also scares me, but hopefully I can take what I learned from here and apply it to that.

As a result of the skills and opportunities mentioned above, the students were pleased with the project and recommended keeping it as essential for future students in the course.

### **Discussion**

The VCF Project aimed to help students master skills associated with career fairs and interviews: preparing and delivering a professional introduction, crafting and discussing a resume as a visual, answering interview questions, and utilizing persuasion. In an ongoing pandemic, where companies will continue to adapt their recruitment strategies (Hankel, 2022; Maurer, 2021), the VCF Project builds skills business, information systems, and communication students will need in a continually evolving virtual world: online presentation of self and space, online file sharing, immediacy through a webcam, and mastery of an online platform (Karimi & Pina, 2021; Walker, 2020). Below we offer pedagogical recommendations related to the principles of constructivist learning as well as practical recommendations and adaptations.

### **Pedagogical Recommendations**

Our students performed better with practice. Students even acknowledged that the practice helped them perform better throughout the project and gain confidence. The following

are possible suggestions for practice. First, provide examples of successful elevator pitches and resumes related to course specific majors before submission of the written assignments. We also recommend a resume workshop with students in class. The first author also reviewed the elevator sketch and resume documents with students during a one-on-one project meeting before their presentations. Second, since many of the skills are performative, students should practice those skills and receive feedback on specific components before the career fair simulation. We recommend a practice session with the platform (e.g., Zoom), including working the video and microphone, file upload, and image management on a webcam (e.g., professional attire and space). The students should also practice gathering and answering interview questions – regular and STAR – either live with other students or in a written discussion board. Finally, for both written and performative aspects of the project, we recommend asking students to explain their strategy (e.g., information included in the pitch, formatting of the resume, stories chosen for a STAR answer, how they dressed, and the space they picked).

### **Practical Recommendations**

Many information systems, communication, and business students only have the opportunity to attend one to two career fairs on campus throughout an academic year, virtual and/or in person, depending on their university organizers. While there are many recruiters who attend these career fairs, if students can only attend one per semester, they will not be able to make many connections. Virtual career fairs outside of the university, and simulations like the project described here, can give students more practice opportunities. Professors looking to point their students in the direction of industry VCFs can send their students to Amazon or even look at their own community for local VCFs (e.g., Amazon Career Day, Eventbrite virtual job fairs).

### **Possible Adaptations**

Some adaptations to the VCF Project that faculty can assign would be to follow up the conclusion of the project by requiring students to attend a virtual career fair of their choice. Students would then be able to practice what they have learned in the assignment-set and reflect upon their experiences and share them with the class. In their reflections, students suggested various adaptations to the project as well. One student suggested it would be helpful to invite a local recruiter/employer to join in on the VCF presentation, thus giving students outside expert feedback. Another student felt it would be helpful to have in-person practice interview sessions with their classmates in the week leading up to the live presentation to simulate the awkwardness of delivering a pitch and answering questions on the spot. Lastly, one student suggested that students should participate in a live practice run with the professor or possibly in multiple recorded interviews, so the students can watch themselves and learn from their experiences before the presentation is graded. Many iterations of this project and its individual assignments can be considered.

### **Conclusion**

The COVID-19 pandemic continues to change the way businesses recruit and interview potential employees, especially college graduates. While pre-pandemic skills related to professional introductions and interviews remain relevant and essential for business graduates, the students now need to master virtual platforms, new file sharing and immediacy techniques, and online impression management. The VCF Project was designed to help both business communication and business information systems students engage meaningfully with recruiters and potential employers during an ongoing pandemic and an ever-changing workforce. The authors hope this project will help both professors and business students as they navigate this new way of communicating with potential employers.

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## **Appendix A: Virtual Career Fair Project Assignment Specifications**

### **Assignment Overview:**

All professionals should be able to concisely introduce themselves, their skills, and their goals. You may need to give a professional introduction in a variety of situations including networking situations, meetings, employment interviews, conferences, and other formal and informal professional events.

One specific event all students should be prepared for is the career fair. Given that we are living through a multi-year global pandemic, many career fairs have been moved to online spaces, and some companies are committed to online recruitment for the foreseeable future. Virtual interviews are also becoming a less-costly popular option for candidate selection. As such, you will prepare a professional introduction and resume that can be used at a virtual career fair.

During this project, you will practice four specific skills to prepare you for these different situations: (1) developing and delivering a professional introduction, (2) responding to recruiter questions, (3) designing a resume as an accompanying visual, and (4) preparing a professional image and space.

### **Resume**

To accompany your pitch, you will prepare a professional resume, which is often an expectation at career fairs, as a visual component of your accomplishments and a supplement to the pitch.

- The resume should follow a chronological format.
- The resume should include your name and contact information, education, and experience as major sections. Additional sections are optional, but not required.
- The resume should have a professional file name including your name and “resume.”
- The resume should be smoothly and professionally uploaded via Zoom during your Career Fair Pitch.

### **Sketch and Strategy Statement**

Before delivering the presentation, all students will complete a sketch or plan of their elevator pitch and a strategy statement about what was included.

- **Sketch:** Prepare a written elevator speech that will serve as a plan you can practice in preparation of delivering the pitch.
- **Strategy Statement:** Since elevator pitches are short, you will not be able to include all of your skills and experiences in a single elevator speech; therefore, your strategy statement should explain why you chose the specific content included in your pitch and why it meets your persuasive goals.

### **Career Fair Pitch and Q&A**

You will deliver a live elevator pitch (e.g., professional introduction), which communicates who you are, your unique experiences, and potential contributions. You will also be required to answer at least one question pertaining to your pitch.

- **Pitch:** Deliver a polished version of your Elevator Speech live via Zoom.
  - You should be seated in front of your computer/webcam for the presentation in a neat, tidy, professional space suitable for an interview.
  - Since a career fair is a semi-formal to formal occasion, the pitch should be delivered in a conversational manner, without notes.
  - Your pitch should be 45 seconds – 90 seconds in duration.
  - Your pitch should mention your resume, and you should send the document through Zoom during the pitch.
- **Q&A:** You will also be evaluated on how you answer at least one question pertaining to your pitch.
  - Prepare to spend approximately 1-2 minutes answering questions.
  - Since how well you answer questions will reflect on how convincing and persuasive you are, you should prepare answers to common questions in advance of the in class career fair.
- **Note: The Zoom Waiting Room** will simulate the line you would normally wait in at an in person career fair. You will wait for your turn to talk to the “recruiter” in the waiting room. Since you could be permitted into the room at any time, you should maintain your professionalism and your readiness as you wait.

### **Virtual Career Fair Date and Time Sign Up**

- There are 6 Career Fair Slots to choose from. Check your calendar to see when you are available.
- Sign up for your preferred date and time from the choices on the Wiki. Once the schedule is set, you will not be able to change your time slot.
- Once you have signed up on the Wiki for a specific date and time, you will receive confirmation from your professor in the learning management system.