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Generation Z, Learning Preferences, and Technology: An Academic Technology Framework Based on Enterprise Architecture

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ABSTRACT

This work provides an overview of Generation X, Y (Millennials), and Z and their characteristics in academia. We present the ways that mobile technology is infused into their lifestyle. We reference how Generation Y and Z in particular expect technology to be integrated into their educational experience, as well as how it helps faculty to facilitate both synchronous and asynchronous learning. Furthermore, an overview is provided of how technology currently contributes to learning and provides a framework for how educators can better engage current students. The conceptual academic technology framework (ATF) put forth in this work will provide an immediate impact in several key areas. This framework enhances structure during course design, which may be based directly on learning outcomes and department/school objectives. It will also directly improve consistency in faculty/student communication by closely monitoring how changes in communication methods have evolved. Finally, we describe how to integrate technology in a meaningful way, in a manner that does not distract students while preparing them for careers in business.

Keywords

GEN Z, TECHNOLOGY EDUCATION, DIGITAL NATIVE, ACADEMIC TECHNOLOGY, LEARNING MANAGEMENT SYSTEM

INTRODUCTION

The issue of how to provide quality education in business schools in the United States of America when traditional classrooms are a mix three to four generations is a conundrum in academia and society. Although there is still debate about where to draw the line of demarcation separating generations, it is generally accepted that Traditionalists represent those born from 1900–1945; Baby Boomers, 1946–1964; Generation X, 1965–1980; Millennials, 1981–1996; and Generation Z, 1997–present (Howe and Strauss, 2000; Mitchell, 2002; Dimock, 2019). These groups are classified in this fashion because research has shown that each generation, as a group, has differing societal, educational, and personal attributes that tend to vary between generations. Among these attributes are significant societal influences, such as core values, family experience, and work ethic (Howe & Strauss, 2000; Mitchell, 2002). With Generation Z beginning to enter the workforce, there are currently four generations interacting in the workplace, and these groups have vastly different sensibilities and priorities (Bonner et al. 2012, Arkhipova et al., 2017).

It is commonly accepted that information technology (IT) has changed how people work, live, learn, and entertain. However, we may overlook the impact that IT has had on our educators. Traditional-aged college students today have attitudes and aptitudes that have been largely influenced by IT and the media that they consume (DeBard, 2004; Arkhipova et al., 2017). These students were raised in the presence of the Internet, social media, and computers. There is little doubt that regular exposure to technology has had an impact on these students' levels of concentration, engagement, and their ability to adapt to differing environments. This, then, raises the question of what, if any, tangible value the Gen Z students' experience adds to the context of collegiate learning.

Today's students are truly digital natives, meaning they were raised with technology, and access to digital tools has been a part of their lives and education from the start; this differs from Millennials, who watched these tools evolve (Dimock, 2019). Students in the classroom currently are seemingly inseparable from their mobile smartphones and computers. They are in constant communication with family, friends, and the world around them. They use their smartphones for myriad activities—from sending emails, reading news, information searching, and using various social media mediums such as Twitter, Instagram, and TikTok. A byproduct of this connected lifestyle is that they tend to prefer a more hands-on approach as opposed to active listening or lecturing. For all the connectedness that some Gen Z students - the current generation - enjoy and prefer, the likelihood that their professors and instructors share their level of familiarity and perceive the need for those same vehicles in the classroom is low. What then, does this discrepancy of preferred resources mean for the classroom?

Although multiple generations working together in any capacity may pose its own set of unique challenges, there is increased uncertainty among those in academia about how to effectively communicate and educate students without being abrasive, elusive, or aloof from current societal norms (Markulis et al., 2014). Aside from differing generations, it is important to note the unique characteristics of Gen Z students who are beginning their journey

through the collegiate landscape: they are the most racially and ethnically diverse group in the history of the United States, even more than the previous holder of that title, the Millennials (Howe & Strauss, 2000; National Center for Education Statistics, 2000; Dimock, 2019). In today's college classrooms, professors are more likely to be Generation X or older, whereas the students they instruct are potentially two generations removed. Due to the drastic difference in technology exposure among these groups, we find motivation for research that details best practices in today's technology-infused, multi-generational academic setting.

Universities are charged with equipping students with the tools necessary to succeed in their chosen field. This is a goal that increases in complexity when the students no longer see the professor as the main source of information—due to the progression of technology and the flexibility it provides. Often, students view the "Google search" as their primary source of information, and the professor as their secondary source, which changes the traditional dynamic of classroom instruction. Those working in academe, specifically higher education, are challenged on several fronts, but chief among them is ensuring that their students receive a quality education. Long gone are the days where consumer-level technology was not prominent or taboo in the classroom. Now, technology must be embraced and integrated to engage and relate to students in a world where technology is omnipresent (Morreale & Staley, 2016; Bracy et al., 2010).

LITERATURE REVIEW

A generation is defined by groups of individuals born during the same time period that have been highly influenced by the events and social trends taking place during their upbringing (Mannheim, 1970; Schuman & Scott, 1989). This commonality of age and experience has a profound effect on the behaviors of a population segment. Although this will not make them completely homogenous, it is widely accepted that there are some group characteristics that persons born during the same period will display based upon their common formative experiences (Ryder, 1965).

Generation Z is the moniker for the generation of people born after 1995 (Francis & Hoefel, 2018). Millennials and Generation Z may share many commonalities; however, they also have their own unique characteristics (Schroth, 2019). With respect to size, Generation Z is currently the third-largest age cohort in America behind Millennials and Baby Boomers, with a US population of 67.17 million (US Census Bureau, 2019). Though they are not the largest age cohort in America, this group represents the changing racial and ethnic demographics in the United States, with only a slight majority of Gen Z identifying as non-Hispanic white (52%). 25% of this group identifies as Hispanic, 14% as Black, 6% as Asian, and 5% as some combination of races (Parker & Igielnik, 2020). Gen Z is, therefore, more racially and ethnically diverse than any previous generation.

As it relates to education, Gen Z is on track to become the most educated generation. The pattern of each subsequent generation being more educated than the previous group has continued. Over 40% of Gen Z has at least one parent with a bachelor's degree or higher. This number is up from the 32% of Millennials that had this level of parental education. Additionally, Gen Z is less likely to drop out of high school than previous generations and more likely to enroll in college (Fry & Parker, 2018).

Based on research by Murad et al. (2019), there are a few common themes that frame Generation Z's learning preferences. First, this group learns best through hands-on activities. Next, this group prefers clear goals accompanied by quick feedback directly aligned to their effort or output. They also prefer learning not to feel hierarchical; they desire a more personal experience that feels fun or positive and allows for the freedom to ask questions without fear of embarrassment. There is also a desire to integrate technology into their learning process. A demonstrated preference for solving problems that require critical thinking as opposed to recitation or memorization has also been observed.

Sociologically, Generation Z is unique in that they value individual expression and avoid being identified by labels. They are also very altruistic and will rally for causes that they believe in. Moreover, they prefer to take a more pragmatic approach to dealing with social interaction (Francis & Hoefel 2018). They trust the power of dialogue over conflict and believe that their voice is just as important as established entities such as governments and administrations. Thus, they approach their role in the educational system as active collaborators rather than passive recipients.

These characteristics lend themselves best to a more engaging and interactive learning environment. Often, the instructor-led lecture is still the predominant method of instruction today (Savery, 2015). However, the use of an exclusively lecture-based delivery of the curriculum that worked for previous generations is not ideal in today's classroom. Largely because technology is so pervasive in the lives of Generation Z, the tolerance among this group for learning that is delivered only via the Socratic method has decreased (Prensky, 2001; Cilliers, 2017). Incorporation of active learning techniques, such as problem-based learning or the integration of technology in the classroom, is critical for success with this group (Roehl et al., 2013).

Members of this generation are the true digital natives. This generation does not remember the world before smartphones. The ability to access information instantaneously has given them the opportunity to view the world around them as a smaller place. With such an embedded use of technology in all aspects of their lives, these students expect to see its use in higher education, particularly in the transfer of knowledge (Kirkwood & Price, 2005; Cilliers, 2017). In the process of teaching this group, it is prudent to identify and employ the best means of meeting these expectations while also meeting the needs of the work force. Research shows that current technical competency is a required for Millennials entering the work force today (Miles and Wilson, 2014), and that these skills must be coupled with soft skills and the ability to translate the ability to use technology to produce desired business outcomes (Gibson & Sodeman, 2014). This means that classroom instruction should introduce technology that is used in industry, dissect how and when it is best used, challenge students to utilize it in a hands-on scenario, and then analyze and report the outcomes. By understanding this generation's attributes and preferences, noted for their native engagement with technology, we will highlight factors and themes that support the achievement of current students—specifically those completing degrees in the realm of technology within business schools and colleges.

As the classroom environment has evolved over time, both faculty and students have come to significantly impact the norms and processes that occur therein. Technology is a daily tool of Gen Z students; the role of technology in the classroom, then, must be well understood for faculty to adopt it as a norm for teaching and thus ensure its purposeful placement in the learning process. It is also worthwhile to note that university leadership is adopting technology on a large scale, and this push for modernization may or may not take into account faculty comfort level with these tools. Understanding the ways that both students and faculty use technology is critical to the successful creation and growth of academic programs and learning spaces. This research aims to provide a missing comprehensive framework and model, the Academic Technology Framework (ATF), to test the effectiveness of technology in instruction, specifically in the business discipline.

CONCEPTUAL ACADEMIC TECHNOLOGY FRAMEWORK

In this section, we describe frameworks for integrating and streamlining technology into pedagogy. Generational differences in the traditional academic setting often contribute to a gap in communication, process, and technology. Gen Z students often remain in constant contact through mobile technology (iPhones, Android Devices, tablets, etc.) and multitasking activities, including switching between social networking sites, streaming services, and other online resources during a class session. Gen Z is used to a close connection to many resources via mobile devices, stimulating the student to partake in multiple streams of information flow that may lend to or detract from the academic experience. Often, Generation X and Generation Y instructors design educational courses using traditional academic resources, which include but are not limited to visual aids to augment in-person lectures (synchronous learning), providing paper-based learning aids (static documents), and videos to strengthen learning outcomes.

Communication interfaces create a foundation for sharing academic methodologies and technology; however, communication and processes establish a difference in educational experiences. As technology advances, a common communication framework is needed to promote consistency and organization in the classroom.

The core architectural framework provides a map of how academic concepts, tools, and processes can coexist in higher education (Jallow et al., 2017). The conceptual Academic Technology Framework in this study expands the dynamics and use of processes and tools in a learning environment; expands upon common academic narratives; reveals an enhanced educational engagement model; and streamlines the use of technology. Enterprise frameworks foster consistency in organizing, promote consistent messaging, and provide an integrated model within an

institution (Zachman, 1987). The academic framework is a descriptive framework used to extract generational teaching disciplines and marry them to a neutral model.

An enterprise architecture provides a disciplined approach to information systems across organizations (Zachman, 1987). The enterprise architecture, if designed correctly, promotes consistency in organization concepts and leads to the quality of information. Ideally, the framework provides clarity in communication channels within an institution. Strategies, objectives, and outcomes are better classified with an enterprise framework in place. Overall, the quality of deliverables and institutional alignments is influenced by the adoption of an organization enterprise architecture.

Enterprise systems are complex and provide different outcomes based on departmental objectives. In a university, PeopleSoft may be used to manage human resources objectives. However, the research department leverages PeopleSoft for grant coding and may have a different name or decentralized database. The outcome may result in redundant data and some confusion when reporting finances to accounting departments or reports to the office of the president. An enterprise architecture diagram assists in designing systems that provide consistency with respect to how data and information are disseminated across multiple organization. This reduces data redundancy and improves how information is shared. It also increases synergies across organizations when additional data are required for other projects, objectives, and outcomes.

The ATF provides a high-level view of scholarly communication, processes, and tools (data, methodology, technology) for Gen X and Gen Y (Instructors) and Gen Z (college students). Additionally, the academic framework reveals the importance of a cohesive set of procedures and a common platform. The outcome will encourage collaboration and consistency in learning outcomes, as well as promote technology to achieve success in the classroom.

Common communication frameworks, at least at a high-level, promote an elastic environment, lead to better management of academic tools, cultivate common language protocols across generational norms, and create (or strengthen) an established successful learning pattern to improve student learning outcomes. As higher education demonstrates a greater awareness for autonomous environments, the consistency of tools (eBooks, social tools, content management tools) is essential to define and promote. Common communication frameworks also help define a conventional language when addressing the tools required to deliver a successful lesson plan [i.e., does asynchronous learning mean the same thing across all generations?] (Figure 1).

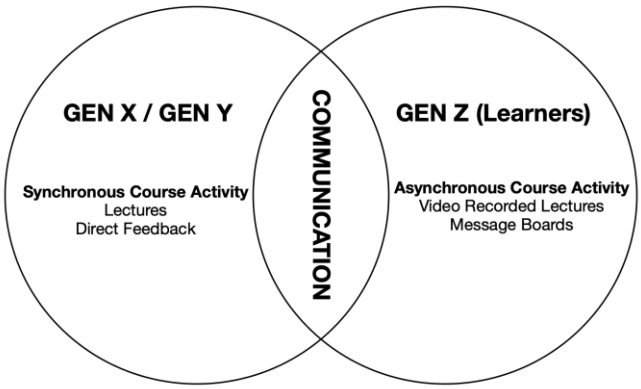

Figure 1. Comparison of Generational Academic Communication Styles

Learning objectives and outcomes are communicated in syllabi and offered during the semester, and these frameworks create and establish an actual protocol to govern this vital activity. The ATF (Figure 2) is an enterprise architecture framework that provides a foundation for successful implementation of a concordant academic platform to deliver consistency in content delivery for the multiple generations in higher education.

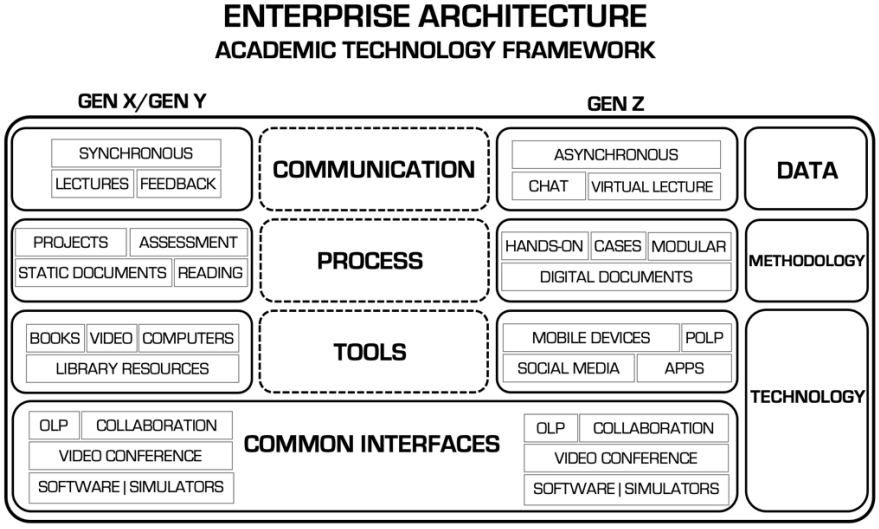

Figure 2. Enterprise Architecture Academic Technology Framework

The framework categorizes multimodality communication between generations in academia. Communication methods between Gen X / Gen Y and Gen Z differ but are designed to yield the same results, such as synchronous vs. asynchronous or lectures over virtual discussions. Additionally, the framework outlines the differences between direct feedback (verbal or written) and electronic correspondence (e.g., email, chat rooms, discussion threads, etc.).

The academic framework strengthens communication channels to streamline how data are communicated within curricula. For example, clearly understanding Gen Z learners' preferences—such as chat dialogue (e.g., text messages, email, social media chat), asynchronous activities (recorded lectures), and virtual lectures—will assist instructors in creating the appropriate activities to improve learning.

Visually represented in the ATF, processes (or methodology) are the educational activities required to achieve learning outcomes, which combined include (but are not limited to) projects, assessments, cases, reading, labs, and digital documentation. When creating activities, instructors should consider how Gen Z learners view processes. The academic framework may assist in evaluating the best approach to designing activities to maximize learning outcomes. As instructors consider assessments for a course, the educator can customize the framework to create more hands-on types of assessments or leverage scenario.

Academic tools in this framework refers to the resources used to implement scholarly theories, activities, tasks, and deliverables such as video, computers, library resources, etc. However, many Gen Z learners take advantage of messaging/chat, online learning platforms, mobile devices, and social media (Hershatter & Epstein, 2010). The academic framework distinguishes between traditional tools that Instructors may rely upon and the progressive technology adopted by learners to advance knowledge. Current learners may spend more time in social networking environments, so creating opportunities to share academic activity using these platforms creates a rich and targeted learning environment. The outcome cultivates a design for the execution of a quality engagement model, which meets students' needs.

The ATF, if appropriately implemented, will provide a disciplined approach to academic outcomes in several key areas. Based on Zachman descriptive theories, the ATF advocates for structure during course design that is based directly on learning outcomes and department/school objectives (Zachman, 1987). It may also streamline faculty/student communication by highlighting how communication methods have evolved and leaning into the strengths of the individuals involved. A practical example is the normal delivery of flowcharting programs in a course requiring students to design diagrams using graph paper, pencil, and stencils. The framework reveals Gen Z learning preferences are for digitized documents over the manual approach of diagraming. Gen X and Gen Y instructors should redesign this exercise to take advantage of publisher online learning platforms (POLPs) or apps such as LucidCharts to complete diagraming.

Teaching methodologies have the potential to be strengthened when universities/colleges adopt the academic framework. As the framework acceptance and application increases, a benefit will be to promote broader use and greater adoption of the functionality contained in universities' online learning platforms (OLP) such as Blackboard, Moodle, Canvas, etc.

Traditionally, at the end of a course and before starting a new class session, instructors can use the ATF to improve course (re)design. It can help to enhance the course syllabus, improve course delivery, and promote better assessments. If an instructor notices that a student has challenges with specific learning outcomes, then they should make changes to the course syllabus to include more hands-on activities, like cases or simulations. This process will also effect a difference in the course delivery by leveraging the OLP chatrooms or discussion boards to post questions that challenge students to better understand the cases and share a dialogue with the instructor and students. The framework strengthens consistency across departments and schools if adopted by all instructors in an institution.

As an example, case studies offer exposure to real-world issues and promote better collaboration with students (teams) and build analytical skill improvements on assessments. Although it is common to design courses based on personal experience, the framework will provide structure and suggestions on how changes will influence generational learning and improve student engagement.

Mobile devices are widely used today: most students use cell phones, tablets, wearables, and other ubiquitous devices in the classroom at all times. It has become a challenge to promote active listening during lectures and encourage feedback. Having students put away mobile devices during class lectures may cause more distraction because Gen Z considers mobile devices as critical to their success.

Instructors can leverage mobile devices to promote in-class feedback using real-time voting platforms (social media), post questions to the professor via discussion boards or social media blogs, or use crowd-sourcing techniques to challenge students to complete a task or research a topic. These types of activities enhance communication in the classroom, promote active listening, and support hands-on applied learning activities.

Currently, student requirements to turn in physical documents, purchase hard/soft copies of text, and create hand-written notes have decreased because of Gen Z students' increased dependency on technology. Use of the framework would then initiate a direct change to the course process, leveraging more digital resources for course deliverables, requirements, and outcomes. Furthermore, the framework will help identify areas requiring modifications, such as eBooks, publishing resources (and content), and digital note-taking applications for mobile devices. Students may request more digital content such as lectures and videos to assist with understanding lessons. Also, instructors may require students to have access to the technology needed to foster consistency in outcomes.

Many colleges and universities have deployed campus-wide learning management systems (LMSs) to facilitate courses. The LMS is used to deliver lectures and training and organize course administration for students. However, there may be courses where faculty are not using this platform or maximizing its capabilities to deliver course content. The ATF aids instructors in mapping features, artifacts, and other essential tools to a common interface. For example, if a university uses the Blackboard platform, then instructors seeking to improve communication by creating discussion threads could use its discussion feature to evaluate and grade students based on feedback or participation. Another example is if students have requested more practice on spreadsheet-based assignments, the instructor could use Blackboard to post assignments directly through the textbook publisher's add-in course content (e.g., Pearson Labs, McGraw-Hill, etc.). The common interface is essential because it ensures consistency across schools and colleges in the university.

DISCUSSION

Evaluation

In typical enterprise architectures, an evaluation element is usually tracked through the system development lifecycle, and then it is measured, assessed, and improved according to the organization's mission to provide outcome-oriented results. Our conceptual model differs in several ways from traditional enterprise architecture. However, the most significant difference is that it is situated in academia rather than in a corporation. The conceptual

model is focused on the "big picture,"—or rather the practical application instead of evaluation through the traditional empirical lens. The model shows the preferences of the different generations and the technology to which they have become accustomed. If implemented, the framework will provide faculty and students guidance to highlight generational differences and expectations, especially in a hybrid or virtual space. Differences are to be expected when the university's expectations or the college, student, and faculty differ, as is the case when there is an abrupt shift to virtual learning. This shift was witnessed by many universities during the initial phase of the COVID-19 pandemic. The model demonstrates how to bridge communication styles to seek to understand the perspective of the different parties involved in the current academic setting.

Integration

Using the proposed ATF allows academics to visually analyze and subsequently structure how Gen Z students prefer to be engaged. The first component of the ATF focuses on the how to communicate with students. In terms of communication styles, Gen X and Gen Y Instructors prefer a synchronous learning arrangement, in-person meetings, and in-the-moment feedback, whereas Gen Z learners appreciate a virtual environment and electronic forms of correspondence. Utilizing a method that supports student preference for communication is essential to ensuring they remain actively engaged in the academic process.

The second element of the ATF focuses on the methodology students enact to process course content. In terms of educational processes, Generation X prefers projects and value-based reading, whereas Generation Z prefers an immersive educational experience, practical case studies, and digital documents. Methodological processes should be varied throughout a course to appeal to the dynamic learning preferences of students. If there is an understanding that all students do not learn the same way, then it is reasonable to believe that not all courses would use the same methodological or instructional approach. By varying educational activities, there are opportunities to increase the percentage of students actively learning and retaining concepts in the classroom.

The final aspect of the ATF is the technology tools that serve as a platform to deliver the course content as well as conduct assignments and assessments. In terms of tools to be used to facilitate learning, the use of computers is integrated, but the degree to which that use occurs varies. Generation X learners prefer video, books, and library resources, whereas Generation Z students prefer using various chat utilities, social media, and blogs whereby they may access more current information. There are LMSs such as Blackboard, Moodle, Canvas, and others that provide mechanisms for Generation X and Generation Z students to interact. However, the challenge is for instructors to adequately leverage the systems to engage students, as well as for universities to adopt a model using which not every class must be taught in a synchronous environment. Many universities are either implementing these models or presently exploring them.

Importance

The importance of a model that succinctly shows the shift in generational preference in learning is key to ensuring that our educators are equipped to teach the next generation of students using the tools available to them. This model also provides an integrated foundation to establish institutional consistency. As shown in the model, LMSs are widely available to educators, but how they utilize them to engage with students is key. To adequately engage with Gen Z students, instructors should strongly consider adapting their method of instruction. It may be difficult for some instructors to cope with the changing learning demographic of students, but the framework is a tool that can be used to support that change. By using the ATF, instructors can chart where their current form of instruction currently falls and begin to incorporate aspects that would appeal more to the Gen Z student.

Synchronous virtual classes afford students the ability to take a class from a distributed environment while allowing them the opportunity to interact with the instructor directly. Additionally, asynchronous classes allow students the freedom to follow a lecture at their own pace and at a time most convenient for them, with the tradeoff of a lack of direct interaction with the instructor during the lecture. Projects, which are a preferred method of assessment for Gen X and Gen Y, can be designed such that the results lead to case studies, which are a preferred method of assessment for Generation Z. The ubiquity of mobile computing, laptop computers, and mobile phones should be embraced by instructors to facilitate instruction through media that students already use. To blend the availability of social media and blogs—to gain initial insights into topics that would then lead them to using web-based scholarly

research databases to ground their initial insights in peer-reviewed work and practitioner published articles—is to blend social media and the academy. However, the ability to successfully integrate all aspects of the ATF depends on the agility of universities to respond quickly to the needs of students, and the willingness to test and consider adaptation of the hybrid classroom model.

Interventions

Academia has traditionally employed a teacher-centered instructional approach. However, as educators seek to integrate technology, we are seeing the adoption of more student-centered learning modes (Lai & Hwang, 2016). One popular method is the flipped classroom approach proposed by Bergmann and Sams (2012). The flipped classroom calls for students to prepare for class by engaging with content before the session to allow for more in-class discussion about the content they have already been exposed to. Technology has made the preparation and transfer of content to students before class time easier than ever before. Although there is a great deal of discussion about which methods educators can use to integrate technology, there is still a technology gap present within teaching (Lai & Hwang, 2016). Two likely barriers preventing the integration of technology into all educational settings are internal barriers, such as teacher confidence and their beliefs about student learning, and external barriers such as access to resources, training, and support (Ertmer, 2005).

The ATF can intervene on the current cycle of internal and external barriers preventing adoption of technology in business education by finding common ground for the educator and the students. University technology decision-makers should be committed to providing relevant and up-to-date software and hardware to their campuses. This framework provides for input from faculty about their classroom goals. By understanding the objectives of their educators, the university can make informed technology investments. Once access to technology that is in line the Educators' needs is granted, the external barriers are then lessened or removed. The university can then provide training and support to ensure that faculty are comfortable with the integration of technology, thereby further mitigating internal barriers.

CONCLUSION

Contributions

The ATF has the capability to help educators structure, evaluate, integrate, and select the correct mixture of technical opportunities to engage and support this new generation of student learners. Through the review of communications, processes, and technology, the opportunity to discern which mechanisms best support student learning for Generation Z learners becomes a more clear and structured activity. Bridging the gap between instructors and student learners of any generation is a complex task, but we believe our novel framework provides the impetus to adopt more flexible and adaptable methods for student engagement using resources that are widely available. Although the actual application of the framework may vary based on the specific learning environment, the use of the framework can encourage reflection on course and student performance to determine useful strategies for existing and emerging technology in the academic space.

This project's contributions to research and practice dovetail. It is our goal that the research outcomes are useful in practical in application. With the change in generations of the student population, a subjective observation that educators are noticing is the increasing struggle to connect the material in a practical and meaningful way that resonates with students through the means by which they tend to learn best. As a result, it is our goal to create a research project that utilizes the ATF to align instructional pedagogy to better suit the mix of student generations in the classroom, while also acknowledging that there is no single perfect solution for all students. The research project would seek to better understand the dynamic in the classroom with an eye toward synergy between the Generation X and Generation Z student populations. The results would inform a set of best practices that would be applicable for Generation X and for Generation Z. A subset goal would be to determine how many, if any, students are willing to seek additional information and understanding utilizing technology outside of the classroom.

Through the creation of these best practices, educators can use the strategies as one data point to facilitate classroom instruction that reaches the targeted population. Our results will add to the growing body of knowledge on technology usage in the classroom, as well as how technology influences Generation X and Generation Z students

in the traditional, hybrid, and distributed classroom settings. Lastly, our final contribution is the practical assistance that the ATF provides to educators. We see this as an important outcome and seek to explore the possibility of expanding the framework into other settings, such as application for non-traditional students and settings that typically serve underrepresented minorities.

Research Agenda

Our research agenda would utilize quantitative and qualitative methodologies for data collection and analysis. We plan to start with two baseline targeted surveys for the traditional college setting—one for educators and one for students. The goal of the survey for educators would be to gain an understanding of how technology is used in the classroom, their perceptions on how teaching has evolved over the years (i.e., across generations) and whether they believe their teaching is as effective for the current generation of students as it has been for previous generations. The survey for the students would seek to gain an understanding of how they believe they learn best and whether they believe their educators are taking advantage of the technology available to enhance their educational opportunities. From analyzing the data gathered from the students, we would seek to find correlation among the generations by which to categorize the initial results.

Based on the findings, we would conduct focus groups with the educators to delve deeper into their understanding of teaching effectiveness using technology. We anticipate there to be generational differences among the educators as well, and we will attempt to extrapolate that data as the research project progresses to determine whether there are not only differences among student generations but also educator generations and what if any impact that could have on willingness to use technology in the classroom. For example, we can see how a tenured professor with many years of teaching experience in a particular setting may view technology usage in the classroom differently than a tenure-track faculty member who may be teaching for the first time outside of their degree program.

Limitations

There are several limitations to this study that we have taken into consideration. The first limitation of this study is that the size of the sample population will likely fall short of what is necessary to make any type of conclusive generalization about a population of students and educators. Therefore, this research should be used as one data point for decision-making as opposed to a conclusive rule.

Furthermore, we plan initially to conduct this research with traditional college students; therefore, the K–12 population in the United States as well as non-traditional college students would be excluded. One of the reasons for this decision is the increased level of difficulty to accurately survey students under the age of eighteen. The choice to exclude the non-traditional setting for now is due to where the researchers currently have the ability to launch new research projects as well as ease of access. These populations could also benefit from a study that is more catered to their environment, and there may be an opportunity at a later date to partner with that population.

Additionally, there will be participants who share qualities possessed by both generations. We will need to consider the racial, ethnic, geographical, and socioeconomic differences among the population set that would impact factors such as access to technology and other financial and budgetary considerations that may preclude one—even if they themselves are willing—from utilizing technology to its full benefit in the classroom.

An additional limitation of this study is that we are proposing this project as one concerned with the evaluation of the value in determining, aligning, and understanding the correct types of technology to support specific academic environments. Thus, our assumption is that the academic institutions that we would be targeting to utilize this framework would already have adopted the types of technical solutions that we are recommending. This framework was not created to influence decisions about technology adoption; conversely, we seek to help those who are seeking to determine the appropriate administration of technologies available to faculty and students. We also anticipate that further adjustment and development of this model will occur after feedback from the study is analyzed.

Despite these limitations, there is still value in understanding more about the student population. There may be additional opportunities to invite other researchers to conduct a similar project on the population that they most likely interact with to add additional value to this particular vein of research—and add to the growing body of knowledge on using technology effectively for differing student populations.

Future Research

Future research worth exploring in this domain would be to extend study to colleges and universities with non-traditional student populations. Typically, non-traditional students bring to the classroom a wealth of experience, and non-traditional universities often utilize technology to reach distance learning students. It would be of interest, as a comparative analysis, to determine whether there are similarities between the traditional and non-traditional students and faculty, in terms of technology acceptance and utilization.

Another worthwhile research exploration would be to determine whether there are differences between Predominately White University students and faculty, and Historically Black Colleges and Universities students and faculty, beyond the socioeconomic disparity in terms of their utilization of technology in the classroom.

Finally, there has been a trend of students learning on the campuses of large technology corporations such as Google and their Tech Exchange, where students at Historically Black Colleges and Universities as well as Hispanic Serving Institutions take courses at Google taught by university faculty that satisfy degree requirements. It would be worthwhile to explore whether students and faculty who are immersed in that type of environment see any difference in their perception that technology is a benefit in the classroom.

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