Volume 9, Number 3 **ISSN 2576-2699**

International Conference Proceedings

October 8 – October 10, 2025

Editor
Dr. Julio A. Rivas, Lipscomb University

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TABLE OF CONTENTS

DEPLOYMENT OF ARTIFICIAL INTELLIGENCE TOOLS IN HIGHER EDUCATION: CHALLENGES AND OPPORTUNITIES

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INTRODUCTION

Higher education is experiencing a paradigmatic shift where Artificial Intelligence (AI) is being incorporated into its administration and instruction delivery alongside student support. Predictive analytics, automated grading systems, AI-enabled chatbots, and intelligent tutoring platforms, among others, are being used in institutions as educational tools to increase efficiency, personalization, and decision-making. The capability to handle big school data has transformed curriculum planning, enrolment predictions, and resource allocation by AI. Nevertheless, even though such systems declare some progress, they may often neglect the emotional and social aspects of education that comprise the foundation of any effective learning experience.

Within the expanding reliance on technology, Emotional Intelligence (EI) proves to be a critical checkpoint, helping to ensure that the inflow of change into institutions is not only informed by facts but also values, understanding, and compassion. EI can be defined as the ability to understand and have control over your own emotions, as well as have the capacity to understand and respond to the emotions of others. Its significance to the teaching and learning process is well-established: emotionally intelligent environments are more inclusive, sturdy, and supportive of student engagement and faculty well-being. As schools implement AI tools to increase efficiency and performance, the lack of emotional awareness in AI-based tools may result in unintended outcomes, such as disengagement, mental health issues, and a loss of belongingness in learners.

This paper presents a strategic human-centric model in which EI can be integrated into the AI-powered systems to establish an emotionally responsive academic ecosystem. Although the existing AI applications in learning are limited to cognitive capabilities, the subsequent development of Artificial General Intelligence (AGI), i.e., the machine capable of simulating human-like understanding, raises questions about how machines can or should interact with emotional complexities. The proposed model fills in this gap that is emerging by reframing EI not as some add-on to the overall redesign of future-ready institutions but as a key component in shaping future-ready institutions. Providing such a pathway towards merging technological advancement and emotional awareness ensures that AI can boost—not substitute- human relationships, which are crucial fundamentals to education.

LITERATURE REVIEW

1. AI Tools for Departmental Transformation in Higher Education

Artificial Intelligence has been identified as a booster toward reengineering academic departments with the overall capacity to optimize curriculum design, faculty services and pedagogical deliverables. Intelligent tutoring systems, natural language processing, and adaptive learning platforms such as Coursera's recommendation engine offer one-on-one instruction and are designed to enhance engagement and outcomes (Zawacki- Richter et al., 2019; Bond et al., 2021). Artificial intelligence (AI) powered Learning Management Systems (LMS) can streamline assignments and grading, reduce faculty workload and enable them to focus on mentorship and innovation. Finally, AI-assisted tools, including Iris.ai and Connected Papers, can help all current researchers increase productivity by detecting themes, recommending citations, and interconnecting interdisciplinary research, benefiting early-career researchers and resource-limited departments.

2. AI-Driven Performance Tracking and Communication

Performance tracking in higher education has been reformed by adopting AI-powered dashboards and predictive models to help generate timely and data-driven information on student behaviours and developments. These applications call out academic gaps as early as possible and facilitate ongoing formative assessment. Real-time analytics observe attendance, submission trends, and engagement levels, allowing a faculty member to intervene in time (Holmes et al., 2021; Ifenthaler & Yau, 2020). It also enables intelligent communication programs that alert guardians to student development processes, which creates family involvement and accountability. EI can be instrumental in this because they keep such interventions humane and accommodating to at-risk or vulnerable students.

3. AI Integration for Alumni and Student Engagement

Artificial intelligence applications such as CRM systems are transforming alumni relations and student engagement by offering deeply personalized communication insights into user behaviour and preferences. Predictive analytics optimizes event recommendations, donation campaigns, and professional networking, leading to an augmented engagement of up to 45 percent (Sharma & Pillai, 2021). Virtual assistants provide current students with round-the-clock assistance, deadline reminders, and extracurricular ideas. Sentiment analysis is also used to monitor emotional clues within student submissions so that mental health support can be provided early on (Lee & Chang, 2020). These emotionally intelligent systems create a closer institutional attachment, aid in career preparedness, and increase alumni loyalty in the long term.

4. AI and Emotional Intelligence in University Operations and Curriculum

In administrative functions, AI has transformed functions like admissions, finance, and personnel scheduling by enabling institutions to reduce person-hour workload by 40% (Singh & Arora, 2021). Predictive analytics can guide long-term planning and curriculum development, and AI can be used to design programs that meet market demand. Some of the courses suggested by the AI analysis are emotional intelligence, AI ethics, digital entrepreneurship, and sustainability, based on socio-emotional and technical learning. Emotional Intelligence helps make these administrative adjustments and curriculum transformations more human, which increases motivation and inclusion within all student populations (Zhu et al., 2022; Mendoza & Rajan, 2020).

5. Structural and Functional Intelligence in Higher Education

Structural intelligence describes AI-enhanced systems that assist the identity of institutional efficiency, such as allocation of classes, digital certification, distribution of resources, and the management of infrastructure. This is supplemented with functional intelligence when making real-time decisions. Blockchain-based systems such as Blockcerts enable safe verification of degrees, whereas energy efficiency through AI has produced potential cost savings (Wang & Liu, 2021; Mavroudi et al., 2022). When combined with emotional intelligence, such technical developments become more morally attuned and sensitive to faculty and students' emotional and psychological needs.

6. Transformative Learning Environments

Transformative learning environments prioritize adaptive and inclusive practices, enriched by AI tools designed to recognize behavioural and emotional cues like stress, disengagement, or confidence levels. Emotion-aware platforms enhance personalization and equity by adjusting instructional methods in real time (Akgun & Greenhow, 2021; Anderson & Lee, 2023). These systems support both student resilience and teacher adaptability, promoting deeper reflection, critical thinking, and well-being. For instance, journaling prompts, peer mentoring, and motivational nudges based on emotional analytics foster trust and belonging, enhancing academic persistence.

7. Engaged Learning Communities

Emotionally responsive governance creates emotionally intelligent learning communities where feedback is constructive, leadership is empathetic, and collaboration is encouraged. Universities employing these strategies report improved morale, increased participation, and a stronger sense of belonging. Administrators trained in EI use data and emotional cues to identify

burnout, anxiety, or disengagement, allowing for real-time interventions like mentorship, workload adjustment, or wellness programs (Williams & Garcia, 2023; Kumar & Banerjee, 2022). AI facilitates the detection, while EI ensures the response is humane and context-sensitive.

8. Emotionally Intelligent Leadership

Leadership embedded with emotional intelligence aligns institutional strategy with human needs. Leaders with high EI promote trust, transparency, and adaptability, particularly when interpreting data for decision-making. Research indicates that emotionally intelligent leadership can increase faculty retention, greater student perseverance, and more ethical management of an institution (Narayan & Thomas, 2023; Mahajan & Jain, 2023). Combining AI dashboards with EI allows administrators to see beyond the numbers, attaching an emotional implication to those figures that can take individuals and policies to a better place.

IMPLICATIONS

The combination of Artificial Intelligence with Emotional Intelligence in higher education dramatically impacts academic leadership, planning, and learning support in institutions. With its capacity to be emotionally responsive, AI sets the future of universities toward a zone of balance between practicality and more people-centered, ethical, and inclusive approaches. This transition will help administrators plan based on data and understand students' and faculty's emotional and psychological well-being. It also lets faculty shape teaching based on real-time behavioral feedback and helps students with adaptive learning environments that note their cognitive and emotional conditions. With the constant adoption of intelligent technologies in higher education, the ability of AI to be strategically correlated with emotional insight will foster not only improved performance but also strengthened trust, engagement, and long-term educational resilience.

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EXPLAINING PRIVATE UNIVERSITIES FAILING GRADES: A QUANTITATIVE AND QUALITATIVE ANALYSIS

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ABSTRACT

Universities, smaller ones in particular, are facing many challenges. Demographic trends have produced fewer high school graduates, society is questioning the value of a college degree and students now have to re-pay their loans after a five-year hiatus. Many schools in higher education are closing every year, with many more predicted to fail in the future. In this paper, lagged data from the National Center for Education Statistics is added to data on universities from Forbes' Financial Health Failing Grades. This research examines private universities in the Mid-West and looks at factors that will likely cause some to close.

INTRODUCTION

The environment that many universities face today is the most challenging it has ever been, particularly with finances. The problems that many schools face is due to both external and internal factors. There have been several exogenous influences, particularly over the past decade that have contributed to this. However, there have also been actions (or in some cases inactions) that schools have taken themselves that also caused issues.

LITERATURE REVIEW

DATA AND METHODOLOGY

Data for this project is from a variety of sources. I start with data from Forbes' Financial Health Failing Grades 2024. Colleges being likely to close doesn't happen immediately. It is a function of decisions and characteristics over many years. I add variables gathered from 2016 thus it looks at the current levels of financial stability as function of lagged variables.

There are two ways to identify the dependent variable, quantitative and qualitative. There is a numeric grade on a scale from less than one (0.805) to just above four (4.227) corresponding to letter grades from a D to an A plus.

The data set potentially has ## independent variables.

There are one hundred and seventy-seven observations.

HOW DOES EDUCATION AND HUMAN CAPITAL AFFECT ECONOMIC WELFARE: EMPIRICAL RESEARCH FROM THE RESOURCES-BASED PERSPECTIVE

Murat Arik, Middle Tennessee State University
Corey Pendleton, Lincoln Memorial University
Riza Bayrak, Middle Tennessee State University

ABSTRACT

This paper investigates the causal effect of higher education on economic welfare from a resource-based perspective by using a two-stage least squares (2SLS) approach. To do this, we analyze how additional years of postsecondary schooling affect wage income at the individual level and how these educational wage premiums vary between industries. Our analysis relies on a large sample of approximately 20.5 million prime-age workers from the IPUMS USA database spanning 2005 to 2023. To address endogeneity, we employ a Bartik-style instrumental variable constructed from state-level need and merit-based financial aid spending. Our findings indicate that an additional year of higher education causally increases an individual's annual wage income by approximately 13.9%. Furthermore, we find positive and statistically significant returns to higher education across 15 industries. The results found that the magnitude of the income wage premium varies, ranging from 9.4% in Social Services to 17.0% in Agriculture. Our results add to existing evidence that the role of education remains a critical component of human capital development and subsequently wage income.

Keywords: *human capital, higher education, personal income, economic welfare, resource-based theory.*

JEL Codes: *I25, I26, J24, O15, O34, O47*

THE IMPACT OF TERRORISM ON FDI: A META-ANALYTICAL APPROACH

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Alper Akpinar, Ege University
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ABSTRACT

The present study investigates the impact of terrorism on foreign direct investment (FDI). Given the validity of the results, a rigorous process was undertaken to consider the inclusion and exclusion criteria. Consequently, 822 studies were covered published between 2008-2025 in accordance with the PRISMA Protocol. Of the 257 estimates in these selected studies, 55% exhibited a statistically significant negative relationship between terrorism and FDI, while 15% demonstrated a statistically significant positive relationship. The effect size was -0.137 in the random effects model. According to the extant literature, this negative, statistically significant random effect of terrorism on FDIs can be considered a small mean effect. This outcome can be interpreted as indicative of the negative impact of terrorism on FDIs. Consequently, it can be concluded that terrorism poses a significant threat to the global economy, particularly with regard to capital mobility. Therefore, governments are suggested to implement some critical measures to mitigate this adverse effect of terrorism on FDI.

Keywords: *FDI, terrorism, meta-analysis.*

ETHICAL BUSINESS EXPECTATIONS AS A MEDIATOR BETWEEN PERSONALITY AND EVALUATIONS OF BUSINESS PRACTICES

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Zinaida Taran, Delta State University

ABSTRACT

Business ethics is an area that has received a great deal of attention; however, the research has concentrated on the behavior of the organizations. In this project we develop a measure of the expectations that individuals have for ethical business behavior. Scale items were developed from the existing literature and consultation with experts. We further propose that these expectations mediate the relationship between personality and evaluations of whether a business is behaving ethically. A survey was used to gather data. Exploratory factor analysis was conducted to trim the scale and structural equation modeling was used for confirmatory factor analysis and hypotheses testing. Our research showed almost complete mediation.

USING AI FEEDBACK TO IMPROVE RESUMES: DOES IT MAKE A DIFFERENCE?

Stephen C. Betts, William Paterson University
Solomon Nyaanga, William Paterson University
Soohyun Lee, William Paterson University

ABSTRACT

The various uses of AI tools by organizations to aid in the recruiting process are firmly established and have been studied. In this project we look at the applicant's end of the process. Does advice from AI improve a resume? We had HR professionals evaluate a set of resumes before and after revisions based on AI feedback to determine if the advice adopted from AI improved the resumes. We also report the comments made by participants and raters.

TITLE IX AND EMERGING COMMERCIAL IMPLICATIONS

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AJ Grube, Western Carolina University
Christopher Doval, Western Carolina University
Cary Caro, La Salle University

ABSTRACT

Title IX of the Education Amendments of 1972 is a landmark civil rights statute prohibiting sex-based discrimination in federally funded educational programs and activities, including athletics. Since its passage, participation by female athletes has increased dramatically—from 7.4% of high school students in 1971 to over 42% today. Yet, despite these gains, gender inequalities persist, particularly in secondary education.

While compliance efforts and legal scrutiny have centered largely on higher education, where the Equity in Athletics Disclosure Act of 1994 (EADA) mandates public reporting of gender equity data, no comparable federal law exists for K-12 schools. The absence of such reporting requirements at the secondary level conceals inequities and impedes enforcement, even though high school athletics often shape future academic, athletic, and economic opportunities for female students.

This presentation examines cases that foreground these overlooked issues, highlighting how the lack of transparency perpetuates disparities in resources, opportunities, and treatment between male and female athletes in secondary schools. These inequities not only hinder compliance with Title IX but also limit pathways to college scholarships and emerging opportunities tied to name, image, and likeness (NIL) rights.

By drawing attention to these enforcement and transparency gaps, the paper argues for extending the principles of the EADA to K-12 athletics. Such reforms are essential to ensuring that Title IX's promise of equal opportunity in education and athletics is fully realized across all levels of schooling.

FACTORS AFFECTING COLLEGE GRADUATION RATES: COLLEGE GPA AND TRANSFER STATUS

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Falynn Turley, Jacksonville State University
Doris Bennett, Jacksonville State University
Shawn Carter, Jacksonville State University

INTRODUCTION

The 6-year graduation rate for first-time, full-time students seeking a bachelor's degree who entered U.S. 4-year degree-granting institutions in fall of 2012 was only 62%. To determine factors that significantly influence college graduation rates, data was collected from students in second-year economics classes taught by three instructors at a regional, public, non-selective university.

Results indicated that early college GPA was the only significant positive predictor for college graduation within six years of enrolling. We also found that those students who transferred from other colleges were significantly less likely to graduate as compared with students who began college at our institution. Ethnicity, gender, grit, financial stress, college entrance exam scores, declared major, first-generation status, and the number of work hours had no significant influence on graduation rates. Females, first- generation students, and Black students experienced significantly more financial stress than other students. White students expected significantly higher course grades than Black students, although when all variables were reviewed, expecting higher course grades had a negative influence on graduation rates.

First-generation students had significantly higher ambition and grit scores than legacy students. Using a subset of the data set, we found no significant difference between the high school GPAs of those who graduated and those who did not.

CONCLUSION

Of the many factors we studied, only early college GPA had a significant positive influence on college graduation. In contrast with previous research, our results found that students who transferred from other colleges to our 4-year institution were significantly less likely to graduate as compared with students who began their college careers at Jacksonville State. On a positive note, we found that first-generation students graduated at roughly the same rates as legacy college students. We found no evidence that ethnicity, gender, grit, financial stress, ACT scores, major, or work hours significantly impacted degree completion. It is interesting that ACT scores, so often used to determine admissions, had a negative, although not significant, correlation with

graduation. Perhaps the impact of undermatching, where highly qualified students attend less selective colleges such as JSU, is at least a partial explanation. This is an area for further research.

In other findings, we noted that females reported working significantly more hours off campus and studying more hours than males. Females also suffered higher levels of financial stress, on average, than males. Alternatively, males expected higher grades, on average, than females. Similar to our findings on females, Black students reported working and studying significantly more hours than white students and reported much higher financial stress levels. White students held significantly higher expectations of the grade they would receive than Black students.

In a review of all variables by graduation status, we found that the average economics course grade earned and college GPA at the beginning of the semester were significantly higher for students who graduated. In addition, we found evidence that students who graduated had higher ambition scores as reported on the Grit survey. Students who did not graduate indicated they expected higher grades than those who graduated.

Results for our sample showed that first-generation students worked significantly more hours per week than the students of parents with college experience. First-generation students scored significantly higher in ambition and grit scores, on average, than legacy students.

To test whether high school GPA influenced college graduation rates, we used a smaller subset of our dataset. We detected no significant correlation between high school GPA levels and college graduation rates.

Based on our findings, recommendations for improving 4-year college student graduation rates would include providing more targeted, research-based support for those students who transfer to 4-year colleges. Perhaps institutions should consider providing advisors/mentors specifically trained to assist transfer students during their transition to and throughout their college career, as transfer students face very different obstacles than those students who enrolled as beginning freshmen.

To lower financial stress and allow for more quality study time, we would recommend that colleges explore providing additional financial support for all students, in particular first-generation, Black, and female students.

As for the student admissions process, our research suggests that it can be improved, with less emphasis placed on ACT scores and high school GPAs. More research is needed to determine which factors would be most helpful in developing an equitable, productive admission process that focuses on recruiting and admitting those students most likely to benefit from a particular institution. High school counselors can assist students as well. To reduce undermatching and promote success in college, meritorious high school students should be encouraged to apply to more selective institutions.

A SYSTEMS THINKING ANALYSIS OF USERS' PERCEIVED RISKS IN SOCIAL NETWORKING PLATFORMS

Kuan-Chou Chen, Purdue University Northwest
Keh-Wen "Carin" Chuang, Purdue University Northwest

ABSTRACT

Social networking platforms have become integral to modern communication, particularly among teenagers and young adults. These web-based services enable users to construct public or semi-public profiles, connect with others, and interact within virtual communities. Despite their popularity, social networking sites present significant risks—both technical and user-related—stemming from the open nature of online interactions and the ease with which personal information is shared.

This study applies a systems thinking framework to examine users' perceived risks and security awareness within social networking environments. Systems thinking enables a holistic analysis of the interrelated factors influencing user behavior, including privacy concerns, trust dynamics, information flow, and community norms. Drawing on qualitative data from college users, the research explores how individual perceptions of risk are shaped by both personal experiences and broader social-technological contexts.

The findings reveal complex feedback loops and systemic structures that contribute to users' decision-making and risk awareness. By integrating interdisciplinary perspectives, this study contributes to the growing field of information security research and offers practical implications for platform design, policy development, and digital literacy initiatives. Ultimately, systems thinking provides a valuable lens for understanding and addressing the multifaceted challenges of security management in social networking platforms.

Keywords: *Systems Thinking, Risk Perception, Social Networking Platforms, User Awareness, Cybersecurity*

ENHANCING THE STUDENT MANAGED FUND LEARNING EXPERIENCE WITH ARTIFICIAL INTELLIGENCE

John Cresson, Southeastern Louisiana University

Student managed investment funds (SMIF) have become enormously popular and allow business schools to teach the theory and practice of Finance. Some students use artificial intelligence as a crutch when analyzing companies for a student-run portfolio. In this paper, I present how our university successfully integrates AI into our student managed fund experience.

Surveys of our last four Finance cohorts reveal that more than 97% of our Finance majors thought that participating in our SMIF prepared them for the job market, expanded their financial knowledge, improved their critical thinking skills, connected the theory and practice of Finance for them, and was a valuable experience. More than 98% of our students think our university should continue offering our students the opportunity to manage our student fund.

TEACHING ONLINE COURSES IN THE AGE OF ARTIFICIAL INTELLIGENCE

John Cresson, Southeastern Louisiana University

In the competitive higher education market, universities have expanded their online offerings to attract and retain students. While online education offers opportunities, it also introduces additional challenges, especially in maintaining academic integrity amid the advancement of AI technology. In this paper, I present integrity-related challenges that arise when teaching online Finance courses and propose possible solutions. Given the growing use of AI as a learning tool by students, professors must adapt their assessment methods in online courses to protect the reputations of their universities.

A USED CAR PRICING MODEL: THE CASE OF THE LEXUS RX 350

John Cresson, Southeastern Louisiana University

Several factors are believed to influence the value of a used car, including its condition, age, mileage, make, model, fuel type, vehicle history, warranty, ownership type, and free maintenance services. In this paper, I present a pricing model for used Lexus RX 350 vehicles. Using a multiple regression analysis, I surprisingly find that only a few of these factors significantly affect the price of a used RX 350.

A COMPARISON OF THREE MULTIPLE CHOICE TESTING OPTIONS AND OUTCOMES IN AN ONLINE COURSE: A NATURAL EXPERIMENT

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ABSTRACT

Each year many professors have to decide how to assess learning in college courses. The proliferation of cheating tactics multiplied significantly with the expansion of AI tools. This and many courses include learning assessments beyond the use of multiple-choice tests. However, a percentage of instructors continue to include the use of multiple-choice testing as a component of their online courses. Three approaches to implementing such tests are supported by the author's institution of higher learning. First, a test can be offered using the standard test app within the Blackboard platform with no additional anti-cheating measures. Second, the same test can be offered to the students online using a "Lockdown Browser" such as the one associated with the Respondus program. Lockdown Browser by Respondus is a secure web browser that locks the testing environment within Blackboard and prevents the user from accessing other programs. When using the Lockdown Browser for an exam, students cannot open a new browser, go to different websites, pull up documents, copy, print, or access any other applications until the exam is submitted. Third, the same test can be given in a proctored environment where the student is observed while taking the test on a computer in front of testing staff watching for cheating behaviors. As a natural experiment, One professor used these three different approaches in 3 sequential sections of the same management course. Each of the three online sections used the same book, took 50-item multiple-choice tests generated randomly from the same test pools, and was taught by the same professor. Average test scores were computed for each semester, and comparisons were made between the three testing approaches. Students scored highest on the first approach (Blackboard only), lower on the second approach (Lockdown Browser), and very much lower when the third approach was used (Proctored). Implications from this natural experiment are discussed.

PREDICTING THE LIKELIHOOD OF DATA BREACH THOUGH OPERATIONAL TECHNOLOGY KEYWORDS

Joseph Hoffman, Marymount University

ABSTRACT

This study investigates the correlation between Operational Technology (OT) usage listed on a company's website and their likelihood of experiencing a data breach. Using data from the Veris Community Database (VCDB), the webpages of companies that have publicly disclosed data breaches were compared with a control group using Term Frequency-Inverse Document Frequency (TF-IDF) methods. The study found no significant correlation between OT keywords on a company's website and public data breaches. These results are significant for companies that use or are considering OT that are concerned with managing their risk exposure, as well as for organizations that manage OT regulations, advisories, and risk frameworks. This work contributes to the growing body of research regarding OT and critical infrastructure security.

INTRODUCTION

There is a large and ongoing convergence of traditional information technology (IT) systems and operational technology (OT) systems occurring throughout the world economy. More organizations (especially those in the industrial sector) are beginning to incorporate Internet-of-Things (IOT) technologies, as well as other cyber-physical technologies such as Industrial Control Systems (ICS) and Supervisory Control and Data Acquisition (SCADA) systems (Kok, van Dongen, Holwerda, et al., 2024). One study predicted that the size of the OT market would nearly double between 2024 and 2030, rising from a value of 210 billion to almost 360 billion (Grand View Research, 2025). This massive adoption of OT is not without risks, however. In 2021, security vulnerabilities in OT almost had lethal effects. An attacker remotely accessed the SCADA systems of a water treatment facility in Oldsmar, Florida, where they almost succeeded in raising the level of sodium hydroxide to poisonous levels (Greenberg, 2021). This highly publicized case brought many concerns about OT safety to the public eye.

This paper seeks to determine if companies that mention OT technologies on their websites have a higher likelihood of experiencing data breach than those that do not. The researcher will compare the websites of industrial-sector victims found in a database of known data breaches with websites from a random sampling of industrial-sector companies for the presence of OT terminology.

BACKGROUND

NIST (National Institute of Standards and Technology) defined OT in its Special Publication (SP) 800-82 as "encompass[ing] a broad range of programmable systems and devices that interact with the physical environment (or manage devices that interact with the physical

environment). These systems and devices detect or cause a direct change through the monitoring and/or control of devices, processes, and event." (Stoufer, Pillitteri, Lightman, Abrams, & Hahn, 2023). There is a plethora of benefits that accompany OT adoption. Research has found that organizations that adopt industrial IOT devices have 70% less unscheduled downtime (Gilchrist, 2016). Another study has found that organizations with integrated cyber-physical systems have around 20% greater operating efficiency (Chatterjee, Rana, Tamilmani, & Sharma, 2023). These benefits are very attractive to industrial firms, and may seem to justify their adoption of OT, even with the risk of potential security vulnerabilities.

These potential security vulnerabilities are bountiful. One study of 45 different OT product families found that each one contained at least one vulnerability (Wetzels, dos Santos, & Ghafari, 2023). A 2021 study using web scanning found similar results for OT devices publicly facing the internet (Duque Anton, Fraunholz, Krohmer, Reti, Schneider, & Schotten). NIST offers an explanation for this massive amount of OT vulnerabilities - OT systems often have huge, decades-long lifecycles and are difficult to replace or update, leading to a lack of security patching. They also often lack the security features that traditional IT systems have, like encryption and intrusion detection (Stouffer et al., 2023). The likelihood of a vulnerability seems to be higher for OT systems, and the damage suffered from an exploit seems to be higher as well. Another 2021 study found that 35% of cyberattacks carried out against OT infrastructure caused physical consequences (Schneider, 2022).

Predicting security risks through data analysis is not new territory. The MAGIC method was developed to predict the likelihood of an organization to suffer a cyber incident. It made predictions based on quantitative risk assessments (Battagloni, Rafaina, Chiaraluce, & Baldi, 2022). Analysis has extended to OT systems, as well. One study identified the internet protocols used by ICS systems on the open internet to estimate the probability of an attack (Nawrocki, Schmidt, & Wahlisch, 2019). There has also been a significant body of work that focuses on using web scraping to inform cyber risk models (usually through threat intelligence). This body of work includes web scrapers that pull from the dark web (Nunes, McGill, Zargari, Marks, Degras, & Tipton, 2016), as well as from more traditional threat intelligence sources (Alsharani & Alshamrani, 2025). That said, there is a well-known lack of public datasets in the realm of cyber risk, which can impair the validity of conclusions pulled from this data (Cremer, Sheehan, Fortmann, Kia, Mullins, Murphy, & Materne, 2022).

Cyber attackers commonly use the information found on publicly available websites to tailor their attacks. Studies have found that 48% of companies had experienced a social engineering cyberattack (Check Point Software, 2011). These attacks are greatly enhanced when attackers pull publicly available information from company websites to augment psychological tactics (Butavicius, Parsons, Pattinson, & McCormac, 2016). Besides intelligence on organizational personnel and structures, organization websites can also give attackers an insight into the types of technologies an organization employs (and the security vulnerabilities that accompany them). If attackers believe that organizations which employ OT are more vulnerable to attacks, websites that mention OT keywords may be more likely to be attacked.

METHODOLOGY

The researcher formulated the following hypotheses to test –

Null Hypothesis (H_0): *The presence of OT keywords on a company website is not correlated with their likelihood of a data breach.*

Alternative Hypothesis (H_1): *The presence of OT keywords on a company website is positively correlated with the likelihood of a data breach.*

The Veris Community Database (VCDB) was chosen as the data source for the breached companies. The VCDB is a public database sponsored by the Verizon RISK team that attempts to aggregate all publicly disclosed data breaches in the U.S. (Verizon, n.d.). The dataset was filtered to include only six sectors that commonly use OT – agriculture, construction, manufacturing, mining, transportation, and utilities. When filtered for these industries the dataset contained 330 data breaches. To generate a control dataset, the researcher used a database of 7 million different companies from People Data Labs (2020). The database was filtered for companies located in the U.S. and then filtered for the six industries. After these filters were applied, a random sampling of 330 companies was selected.

The following pipeline was then applied to both the datasets. A query was made to the DuckDuckGo browser with the company name. The first domain in the results was then taken from the DuckDuckGo query. Any domains that were in the top 50 most common domains on the internet were removed, preventing links to sites like LinkedIn, Wikipedia, and Facebook from being added. Once the domains were compiled, the researcher attempted to download the HTML (Hypertext Markup Language) file for 11 different common subdirectories that would be likely to hold information about OT. These were "about", "solutions", "products", "industries", "services", "capabilities", "technology", "operations", "infrastructure", “automation”, and “facilities”. The HTML file hosted at the domain was also downloaded and counted as a subdirectory. 204 organizations from the VCDB successfully resolved a domain, while 282 from the control group of companies successfully resolved a domain.

Once these HTML files were downloaded the Term Frequency-Inverse Document Frequency (TF-IDF) score was calculated for each document with a set of OT-related keywords; "operational technology", "industrial control system", "ics", "plc","scada", "modbus", "hmi", "real-time monitoring", "industrial automation", "process control", "distributed control system", "cyber-physical", "iot", and "embedded control". Any company with at least one subdirectory that scored higher than the threshold score of .05 was marked as being OT-related (although the threshold of .05 was chosen arbitrarily, alternative thresholds of .01 and .1 yielded the same results).

A two-proportion z-test was then conducted on the two datasets. The proportion of companies classified as OT-related for the breached companies in the VCDB was compared to the proportion of companies classified as OT-related for the control random sample of OT-relevant industries. Statistical significance was assessed at the $\alpha = 0.05$ level.

RESULTS & ANALYSIS

Among the 204 breached companies from the VCDB that had a domain resolve, 47 (23.0%) were classified as having OT-related websites. In contrast, for the 282 control organizations that had a domain resolve, 52 (18.4%) were classified as having OT-related websites. The difference in proportions was statistically insignificant ($z = 1.24$, $p = .22$), suggesting that the presence of OT keywords on a company website does not make it more likely that a company will suffer a data breach. These results do not support rejection of the null hypothesis (H_0), “The presence of OT keywords on a company website is not correlated with their likelihood of a data breach.”

These results have significant implications. If companies that publicly use OT do not have a higher risk of being in a data breach, it could be because OT is just as safe as traditional IT. There

are some potential confounding factors, however. Companies that use OT may be more tech-savvy in general and more likely to have a robust cybersecurity program. This is likely to be even more true for companies that are willing to post about their OT usage on their websites. Conversely, these results could be skewed by an inability of OT-using companies to detect and disclose data breaches.

There are also some potential data gaps in these results. Companies that post about their OT technologies on subdirectories other than the ones sought for in this methodology will not be counted, for example. Also, many companies that employ OT may not advertise it on their website, and these companies will also be ignored by this methodology. That said, the similar proportions of OT-related websites across breach and control groups, even when using different TF-IDF thresholds, are a good indicator that there is likely not a correlation between the presence of OT terms on a company website and the likelihood of a public data breach.

CONCLUSION

This study did not find a statistically significant link between OT usage and data breaches. That said, if 35% of cyberattacks on OT systems cause physical damage, the addition of OT still causes increased risk to an organization (especially to their physical systems), even if their rate of compromise is similar to that of traditional IT systems. More research is required on this topic, but if OT systems are confirmed to be compromised at the same rate as traditional IT systems, regulatory bodies that publish OT risk frameworks should consider focusing their OT-specific security controls more on containing potential-post exploitation physical effects, rather than focusing on preventing initial access. These organizations could also use this information to enable efforts to synchronize the risk management priorities of IT and OT by deprioritizing OT-specific initial access controls in favor of more traditional ones. Companies should feel comfortable adopting OT technologies and reaping their benefits but should remain highly vigilant about implementing these OT security controls.

Much further research needs to be done on the security of OT. Unfortunately, there is a significant lack of data regarding security breaches. More work could still be done with more robust web crawlers, larger datasets, and more advanced methods of webpage classification, such as using natural language processing (NLP) or deep learning models. Future researchers could also use similar methods as this paper to determine the cyber risks of other types of advertised technologies, such as artificial intelligence or cloud systems. Specific vendors could also have risk profiles developed based on their usage by compromised organizations.

OT is a powerful and useful new breed of technology. It promises to revolutionize challenging and critical sectors of the economy. While it may produce some novel risks, the work done in this paper suggests that its advertised use may not increase an organization's overall risk of data breach. Companies that will benefit from adopting OT technologies should do so, but they should continue to ensure that they use OT-specific risk management frameworks to mitigate the risk of physical damage to acceptable levels.

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WHERE HAVE ALL THE HACKERS GONE? REGIONAL DISPARITIES IN THE OFFENSIVE AND DEFENSIVE CYBERSECURITY WORKFORCE

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ABSTRACT

This study investigates the relative concentration of offensive and defensive cybersecurity jobs in the United States. Using data from a public job site and aligning with the Defense Cybersecurity Workforce Framework (DCWF), jobs were classified with a TF-IDF-based machine learning model. The results indicate that there is a disproportionate concentration of offensive security jobs in the National Capital Region (Virginia, Maryland, and Washington DC). These results have implications for workforce development policy and strategic hiring by cybersecurity employers. This study contributes to the growing body of cyber workforce research by offering an empirical framework for classifying and mapping functional cyber roles.

INTRODUCTION

The cybersecurity workforce has long had a distinction between two separate categories of job roles – offensive and defensive cybersecurity. Defensive roles focus on securing cyber systems. These are more traditional cybersecurity jobs that directly increase the security of an organization, such as information security engineers and security operations center (SOC) analysts. Offensive cyber jobs, on the other hand, are focused on compromising cyber systems. Offensive cyber professionals could be hired by organizations seeking to better understand and remedy their own security gaps (such as with a penetration tester) or be hired by government organizations to support military or intelligence-gathering objectives.

Although offensive and defensive cybersecurity jobs pull from similar portions of the labor market, they have different forces shaping their demand. Smaller organizations with less resources to devote to cybersecurity will often opt to exclusively employ defensive cybersecurity professionals, as these professionals directly enhance the security of the organization. These smaller organizations will often turn to firms that specialize in offensive assessments to identify their security gaps for them. As a result, there are far fewer offensive than defensive jobs in the U.S. labor market, supported by security engineers and security analysts being the most common job cybersecurity job postings in the U.S. (CyberSN, 2024). Outside of doing security assessments, however, offensive professionals can also find work supporting defense organizations. The Department of Defense's Cyber Workforce Framework (DCWF) devotes an entire element to “Cyberspace Effects”, which contains personnel that "plan, support, and execute cyberspace capabilities where the primary purpose is to externally defend or conduct force projection in or through cyberspace." (Department of Defense, 2023)

There is a well-known "skills gap" in cybersecurity. About two-thirds of organizations reported a shortage of cybersecurity talent in their organizations last year (ISC2, 2024). Because of this talent shortage, organizations that are looking to hire cybersecurity talent and are unable to offer remote work should consider which local labor markets best serve their needs. A firm that is considering offering penetration testing services, for instance, should consider not only the location of its clients (which could often be serviced remotely), but also where they could find a large concentration of offensive cybersecurity professionals.

Previous work has been done to identify the geographic distribution of cyber jobs within the U.S. Studies have found that Virginia, California, Washington D.C., Maryland, Texas, and New York had the largest concentrations of cybersecurity jobs (Ramezan, McGee, Horowitz, and White, 2023) and that cybersecurity roles tend to geographically follow shifts in other industries (Wang, Wang, Hu, Zhang, and Zhu, 2025). Other work has shown that postings on online job sites can be used to effectively analyze workforce skills gaps (Goupil, Abedayo, & Li, 2022).

There is also a growing body of research demonstrating the efficacy of Natural Language Processing (NLP) techniques in classifying job titles. Perhaps the most pertinent to this study is the job title classification system that was used by CareerBuilder, which classified the job titles on its recruitment boards using Support Vector Machine (SVM) and k-nearest neighbors classifiers (Javed, McNair, & Zhao, 2016). Similar work on job classification was also done using recurrent network architectures (Neculoiu, Versteegh, & Rotaru, 2016). More recent studies have shown the feasibility of classifying based on skills data (Decorte, Van Hautte, Demeester, and Develder, 2021), semantically matching titles with skills (Bocharova, Malakhov, & Mezhuyev, 2023), and using large language models to classify jobs (Li, Kang, & De Bie, 2023). These machine learning techniques should be sufficient to differentiate between defensive and offensive cybersecurity job postings.

This paper intends to examine how offensive and defensive cyber roles have clustered within the geographical U.S. The researcher hypothesizes that, because of the government demands for offensive cyber, the demand for offensive cyber will be disproportionately located in the National Capital Region (defined in this paper as Virginia, Maryland, and Washington, DC) relative to demand for defensive cyber. The results of the study have the potential to inform policymakers of potential gaps in their region's workforce and inform businesses of where their hiring efforts would be best spent. To do this, the paper will use a dataset gathered from Careerjet, a job board with a public API, and will use NLP techniques to classify the postings as either offensive or defensive.

METHODOLOGY

To determine whether the offensive roles were disproportionately located in the National Capital Region (which consists of Virginia, Maryland, and Washington DC), the researcher formulated the following hypotheses:

> ***Null Hypothesis (H_0):*** *The proportion of offensive cyber jobs compared to defensive cyber jobs in the National Capital Region is equal to or less than that in the rest of the U.S.*
>
> ***Alternative Hypothesis (H_1):*** *The proportion of offensive cyber jobs compared to defensive cyber jobs is significantly greater in the National Capital Region compared to the rest of the U.S.*

To begin, a job site was chosen to pull the initial data set from. Careerjet was selected, a job board that aggregates job postings from thousands of websites. Unlike its more prominent competitors, like LinkedIn and Indeed, Careerjet offers a public API (Careerjet, n.d.), which is ideal for the purposes of this study. The API offers access to all current job postings on the site. On July 17, 2025, all job posting results for 'cyber' in the U.S. were pulled from Careerjet, which came to 851 job postings. Next, a list of 76 cybersecurity job titles was compiled, 71 of which were pulled directly from the DCWF. They were labeled as either “offensive” or “defensive”. The DCWF was used as a classification guide, and roles found under the DCWF elements of "Cyber Effects” or "Intelligence (Cyberspace)" were labeled as “offensive”, while roles contained under “Cybersecurity", "IT (Cyberspace)", “Software Engineering”, “Data/AI” and "Cyberspace Enablers" were labeled as defensive. The researcher also added 5 common industry terms for offensive cyber roles that were not included in the DCWF (“Penetration Tester”, “Pen Tester”, “Red Team Operator”, “Red Teamer”, and “Cyber Threat Analyst”). This list of labeled job titles was used as training and testing data.

Term-frequency-inverse document frequency (TF-IDF) vectorization was used to numerically represent the job titles. Unigrams and bigrams were extracted from the job titles, allowing the model to learn contextual distinctions alongside simple word identification. The TF-IDF matrix was then input to four different classifiers- linear SVM, random forest (RF), Naive Bayes (NB), and logistic regression (LR). The F-1 score, precision, and recall of these classifiers are in Table 1.

Table 1
Classification Results for Different Models

Model Used	F-1 Score	Accuracy
Logistic Regression	.909	.908
Naïve Bayes	.909	.908
Random Forest	.909	.909
Linear SVM	.955	.954

The model with the highest F-1 score and accuracy, linear SVM, was chosen to classify the data. About 10% of the roles were classified as offensive, with the rest being defensive. This was an expected result due to the already observed smaller proportion of offensive jobs in the workforce. Job postings were then aggregated based on the state, dropping postings with no location data included. The geopy (Brody, 2023) and folium (Uyttendaele, Bilcke, et al., 2023) python libraries were used to distribute the data into a heatmap of the U.S. Finally, the hypothesis was evaluated using a chi-squared test for independence.

RESULTS

The job titles were classified as 89.8% defensive and 10.2% offensive. As mentioned before, this fits with the intuition that offensive roles are less prevalent than defensive ones. Figure 1, *Top 10 States for Offensive and Defensive Cyber Roles* shows the 10 states with the highest concentration of offensive and defensive cyber roles.

The chi-squared test found a statistically significant correlation between the NCR and the type of cybersecurity role, $\chi^2(1, N = 851) = 4.34$, $p = 0.037$. These results support the rejection of the null hypothesis when using a threshold of $p < .05$, which supports the claim that offensive cyber roles are disproportionately located in the NCR relative to defensive cyber roles. These results are supported by the generated heatmap (seen in Figure 2), which shows by far the largest concentration of offensive cyber roles in the NCR. The defensive roles have a more even distribution across the country.

Figure 1

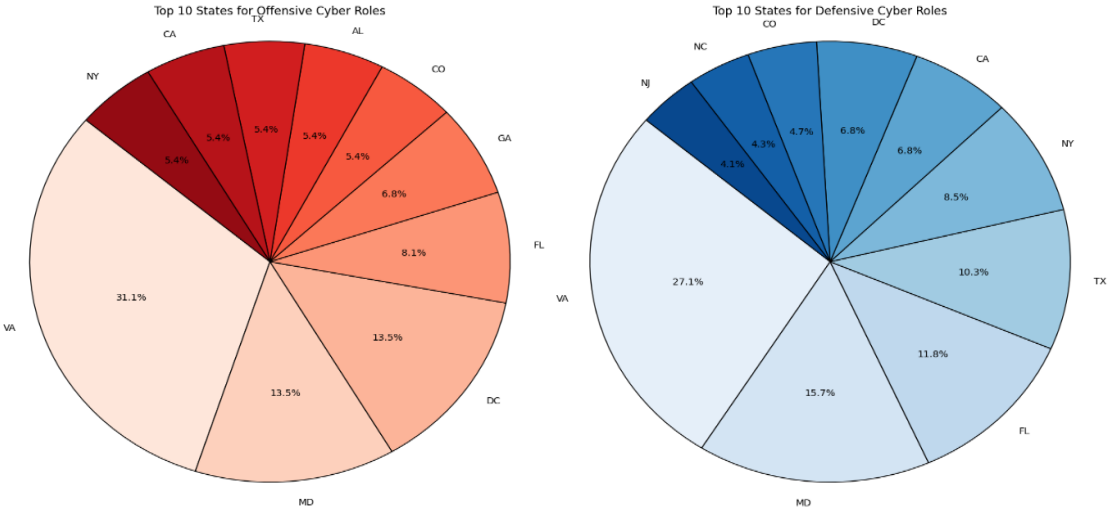
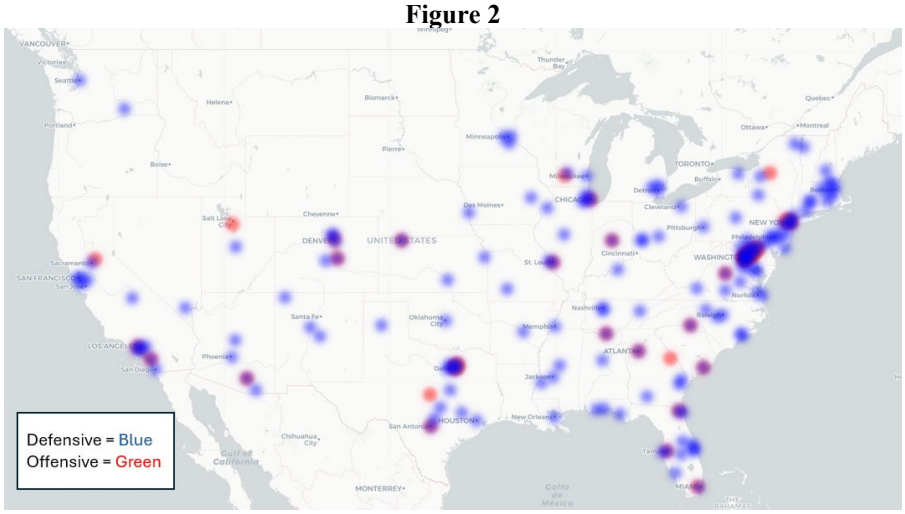


Figure 2



DISCUSSION

The results of this study align with what many offensive security professionals already suspected - there are more offensive jobs available in the NCR. All six of the highest concentration states found by Ramezan et al (2023) were in the top seven most common defensive jobs states,

with the unexpected addition of Florida. All of them were also in the top 10 for offensive roles, although Georgia, Alabama, and Colorado also made an appearance.

The biggest issue with this study was the lack of data. Although Careerjet was useful for the study because of its public API, it does not maintain a publicly available historical database. This limited the analysis to only job postings listed at the time the data was pulled (July 17, 2025). Future research could attempt to assemble a larger dataset by pulling job postings over a longer period, or by aggregating job postings from other job sites.

This study introduced other avenues for further research as well. Future work could explore the concentration of individual workforce elements within the DCWF, as well as specific job titles. Further research could also explore other methods of using machine learning to differentiate between cyber job titles. Implementing deep learning techniques might also prove more effective at classification.

CONCLUSION

By using NLP techniques to classify cybersecurity job postings in the U.S. pulled from an online job site, this study was able to show that a greater concentration of offensive security jobs exists in the National Capital Region compared to defensive security jobs. This is likely because there is a relatively greater demand for offensive cybersecurity from the U.S. government and defense industries than there is in other industries. Businesses and organizations struggling to attract offensive cyber talent should consider recruiting within or relocating to the NCR, while offensive cyber professionals struggling to find work should consider looking within the region. Policymakers should consider the potential implications of this concentration of specialized talent within one region of the U.S. Future researchers should consider utilizing and further developing the framework developed in this study for classifying functional cyber roles.

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ARTIFICIAL INTELLIGENCE, DIGITAL TRADE, AND THE CHALLENGES OF GLOBAL GOVERNANCE: A COMPARATIVE ANALYSIS OF INTERNATIONAL ORGANIZATIONS

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ABSTRACT

The rapid expansion of artificial intelligence (AI) and digital trade is reshaping the global economy, generating both unprecedented opportunities for innovation and pressing challenges for regulation. While AI enhances efficiency and connectivity across borders, it also raises concerns over ethics, privacy, cybersecurity and intellectual property. Although multiple international organizations are addressing AI and digital trade through overlapping approaches, global governance frameworks remain fragmented. This paper conducts a comparative institutional analysis of four key organizations – the World Trade Organization (WTO), the Organisation for Economic Co-operation and Development (OECD), the United Nations Conference on Trade and Development (UNCTAD), and the World Intellectual Property Organization (WIPO) - to assess how they conceptualize and regulate AI in the context of digital trade.

The WTO's report titled Trading with intelligence: How AI shapes and is shaped by international trade was published in November of 2024 and discusses in great length the role of the WTO in shaping AI policy as it may affect international trade. The OECD AI Principles, adopted in 2019 and updated in 2024, are the first intergovernmental standard on artificial intelligence based on five principles and five recommendations for policymakers. UNCTAD's Policy Brief No. 119 calls for the inclusion of developing and even the least developed countries in developing AI policies, which are currently only being initiated by developed countries. AI perhaps creates the greatest challenge for intellectual property rights protection as it is using data without giving credit to the original creators, not to mention possible copyright and other intellectual property infringements. In 2024, WIPO published its Generative AI: Navigating intellectual property guidelines, attempting to overcome these challenges. Drawing on these policy documents, agreements, and official initiatives, the analysis identifies areas of unification, including recognition of AI's transformative role and the need for ethical standards, as well as the challenges and opportunities, particularly in data governance, intellectual property, and developmental equity. Findings highlight significant risks of regulatory arbitrage for multinational firms and underscore the challenges of legitimacy, coordination, and inclusivity in attempting to create global AI standards. We conclude by calling for enhanced inter-

organizational cooperation and multilateral dialogue to foster a more coherent governance architecture, while pointing to regional trade agreements and corporate adaptation strategies as promising avenues for future research.

AI IN ASSET MANAGEMENT: A PERFORMANCE COMPARISON BETWEEN AI-POWERED MUTUAL FUNDS AND QUANTITATIVE HEDGE FUNDS

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ABSTRACT

We examine the performance of artificial intelligence (AI)-managed mutual funds compared to quantitative and discretionary hedge funds from 2019 to 2024. We find that AI-managed mutual funds generate significantly higher cumulative returns than the overall hedge fund average, as well as quantitative and discretionary hedge funds specifically. Despite these superior returns, we observe a strong positive correlation between the returns of AI-managed funds and both hedge fund strategies. Our risk-adjusted performance analysis indicates that none of the fund categories exhibit a statistically significant alpha. We attribute the superior gross returns of AI-managed mutual funds primarily to their higher factor loadings on systematic market risk, complemented by the relatively poor risk-adjusted performance of the hedge fund comparison groups. These findings suggest that the outperformance of AI-managed funds is likely attributable to their increased exposure to systematic risk rather than superior security selection or market timing capabilities.

ARE TAX COURT DEADLINES JURISDICTIONAL OR JUST A CLAIMS PROCESSING RULE?

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ABSTRACT

The Supreme Court opinion in Boechler, P.C. v. Comm., 596 U.S. 199 (2022), coming from the nation's highest Court, produced new questions on the issue of when Tax Court filing deadlines may be viewed as merely a claims processing type of rule, and as such subject to equitable and other exceptions and extensions, versus when the filing deadline will instead be viewed as jurisdictional, depriving the Tax Court of jurisdiction to hear a case if the deadline is not strictly adhered to. The issue has continued to develop over the intervening two *years as different Tax Court deadline rules have been examined by the courts to determine what flexibility might exist regarding such deadlines. If a deadline is not jurisdictional, the law can permit equitable tolling of the deadline based on the facts and circumstances, but if it is jurisdictional, not such leeway is possible. This paper will explore the various Tax Court deadlines for petitioning to the Tax Court, and examine a number of cases to survey in which circumstances deadlines have been treated as jurisdictional, and in which circumstances the deadlines have been treated as simply being claims processing rules that can be tolled or excepted based on equitable principles.*

CAN A FIRM'S MANAGEMENT COMPENSATION STRUCTURE PREDICT THE CREDIBILITY OF ITS STOCK BUYBACK ANNOUNCEMENT?

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June Pham, Shippensburg University
Hari Adhikari, Embry-Riddle Aeronautical University

ABSTRACT

Stock buybacks have become increasingly popular in the U.S., often replacing dividend payouts. While undervaluation is the most cited motive, prior research shows managers may also use buybacks to manipulate stock prices, boost compensation, or signal intentions without repurchasing. This paper examines whether repurchase announcements by CEOs with compensation tied to non-financial performance measures are more credible. We find that such firms not only receive stronger market reactions, especially smaller firms and those with weak governance but are also more likely to complete buybacks and achieve superior stock performance in the two years following the announcements.

PROMOTING GENAI LITERACY IN MARKETING EDUCATION THROUGH STRUCTURED CLASSROOM INTERVENTIONS

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ABSTRACT

The rapid advance and widespread adoption of Generative AI (GenAI) across industries has created a pressing need for higher education to equip students with a working knowledge of and the ability to critically evaluate results arising from this transformative technology. To promote GenAI literacy among marketing students, this study proposes a structured set of learning interventions integrated into existing marketing courses at three levels: lower-division undergraduate, upper-division undergraduate, and graduate. Rather than overhauling existing curricula, these activities are designed to fit within current course frameworks. A mixed-methods research design will assess changes in GenAI literacy, combining quantitative analysis of pre- and post-course self-assessments with qualitative insights from students' final reflections.

TEACHING ENTREPRENEURSHIP WITH *FLAIR*

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ABSTRACT

Entrepreneurship educators face a crucial challenge: integrating technology, particularly Artificial Intelligence (AI), in ways that enhance, rather than overshadow, student creativity and initiative. Some faculty view the use of AI as a form of cheating and thus believe that all use of AI should be banned in order to ensure that students complete entire projects on their own. Others moderate this stance with a classic, "It depends." They analyze the assignments to determine when to prohibit AI and when to allow it. This controlled integration of AI helps students understand how to strategically and ethically use this tool in the business world.

The FLAIR framework is a pedagogical model designed to empower student-led innovation while incorporating AI as a strategic, supportive tool that essentially becomes a virtual team member. FLAIR incorporates five aspects of experiential learning: use of the flipped classroom mode (F), taking a learning for life view (L), augmented by AI (A), interacting with each other (I), and reflecting on ideas individually and as a group (R). The goal of this model is to help instructors teach students how to use AI technology as an assistant that enhances their own uniquely human creativity and strategic thinking not only during their time in school but also beyond graduation.

INTRODUCTION

As artificial intelligence (AI) enters the academic landscape, many educators are apprehensive about its use in an academic environment. AI tools offer immense potential to assist with the various aspects of entrepreneurship from idea generation to market analysis to marketing, just to name a few areas. However, as with most helpful tools, they also present the risk that students will use them in inappropriate ways that short-circuit their own exploration and learning.

The heart of the FLAIR model is the *flipped classroom* (F), with students working together in person on a problem, challenge or activity without the use of technology. Realistically, class time is the only time instructors can truly regulate the use of tech tools, making the flipped classroom a practical format. From a *learning for life* (L) perspective, managers often must conduct research or complete independent work that they then share with others in meetings. They are expected to "be present" in the sense of giving their attention to the people in the group. Practicing these behaviors not only helps prepare students for careers, but it also enhances their interpersonal exchanges during their meetings because they are less distracted by tech. After class, students are encouraged to *augment* their own ideas with *AI* (A) to improve their work and/or come up with new ideas. AI can be especially helpful for creating graphics students insert into reports and presentations. Upon returning to the classroom, students *interact* (I) with each other to share

what they have learned or how they have improved their ideas and projects (particularly through the use of AI) since the last meeting. This is a time for individual and group *reflection* (R) as students think about the new contributions and evaluate how they should proceed. This reflection is vital for multiple reasons, not the least of which is the fact that results from AI may not always be factually true or may exhibit an unacceptable bias. Students can also give each other tips on which prompts did or did not work well in providing useful responses. Reflecting together provides both interaction and improved outcomes.

Overall, the FLAIR method promotes the idea that AI is a helpful teammate that can be involved in many phases of the project but the humans retain leadership of it. By not using technology during class, students can focus on interpersonal communication as they purposefully reflect on the ideas they imagined and/or augmented through the use of AI. In an entrepreneurship course, the ultimate goal is to empower students to generate and develop original, viable business ideas that they feel they could launch, while also providing opportunities to develop important qualities and skills such as self-efficacy and the ability to get along with others. Because only a small proportion of students who study entrepreneurship in college actually start businesses, the greater lessons students learn and the soft skills they develop can be the most important outcomes of a course (Kennedy, Brannon, Powell, McMahon, Podlesny & Henshaw, 2023; Martin, McNally & Kay, 2013; Mawson, Casulli & Simmons, 2022; NACE, 2021; Tantawy, McNally, Mengel, Piperopoulous, & Foord, 2021).

Entrepreneurship is a field in which experiential learning and hands-on activities are common and appropriate practices. The FLAIR model is grounded in several interrelated educational theories that are consistent with effective entrepreneurship education: constructivist learning, flipped classroom pedagogy, social learning theory, and reflective practice. However, FLAIR can be used in other disciplines as its tenants relate to human development in general as well as entrepreneurship in particular. The following section briefly explains the pedogical foundations of the FLAIR model, namely, constructivist learning theory (Lobler, 2006; Bell & Bell, 2020; Akpomi & Kayii, 2022), social learning theory and reflective practice, as well as the flipped classroom design (Hsieh & Maritz, 2023; Rambe, 2023; Thaanyane, 2023).

PEDAGOGICAL FOUNDATIONS

Constructivist learning theory (Lobler, 2006; Bell & Bell, 2020; Akpomi & Kayii, 2022), holds that learners actively construct knowledge through experience and reflection. In entrepreneurship education, this means students must engage with real-world problems, iterate ideas repeatedly to improve and build upon them, and internalize learning through personal relevance. Constructive approaches fit hand in hand with entrepreneurship education and even entrepreneurship itself (Akpomi& Kayii, 2022; Lober, 2006). Students learn more by hands-on projects in which they experiment and adapt to build not only new products but also their own knowledge bases.

Bandura's (1977) social learning theory emphasizes learning through observation, modeling, and interaction. Entrepreneurship students can benefit from seeing their fellow classmates pitch ideas, receive feedback, and improve their products and pivot when necessary.

When students are encouraged to collaborate rather than to strictly compete (as may be the case in a pitch competition) they can learn from others as well as from their own experience (Fyfe, 2020; Roselli, 2016). Environments rich in social learning can improve empathy and motivation as well as retention (Disco, 2025). Empathy, in particular can help improve students' interactions with each other.

Reflective practice (Hagg, 2021; Schon, 1983; Westad Brandshaug & Engen, 2023) is based on the concept that personal reflection transforms experience into insight. As the bridge between action and understanding, it helps students evaluate their ideas, recognize growth, and make intentional decisions. Schon (1983) holds that reflection is especially important for entrepreneurship due to the uncertainty inherent in bringing a new product to life.

These three theories of pedagogy fit well with the concept of a flipped classroom and the use of student interaction and reflection in teams. The flipped classroom design will be covered in the following section which explains how the FLAIR model can be integrated into an entrepreneurship class.

THE FLAIR MODEL IN PRACTICE

In traditional classrooms, students sit passively while they listen to a lecture to absorb the course material. They may work with other students outside the class on group projects and/or homework. The flipped classroom reverses this system by moving one-way communication (such as reading materials or listening to lectures) out of the class and using the valuable time when students are physically together for personal interaction with each other. This model has been shown to increase student motivation, independence and retention (Hsieh & Maritz, 2023; Rambe, 2023; Thaanyane, 2023). The goal of the model is to create deep, rather than surface, learning that students will retain after graduation.

Flipped classrooms align very well with hands-on entrepreneurship education in which collaboration, experimentation, and feedback are essential for success. They also provide instructors an opportunity to monitor student use of technology. Students work together in class without using AI or other technology. This practice of attempting a task first and then asking AI for assistance has been shown in recent research to be very helpful, whereas consulting AI first rather than writing alone can lead to issues with the brain (Kosmya, Hauptmann, Yuan, Situ, Liao, Beresnitzky, Braunstein & Maes, 2025). In a time when it can be difficult for students to be separated from their cell phones, being "forced" to talk to other students face to face can be a beneficial experience.

Outside of class, students use AI to improve and augment their ideas. With guided use (sample prompts, comparison with other students' results) students discover that AI can be very helpful with creative projects as well as quantitative analyses. In fact, students can gain confidence and self-efficacy as they see the work (especially artworks and graphics) that can be produced with the assistance of AI.

At the beginning of the next class, students share their new or improved ideas and then evaluate and reflect upon these ideas with each other in order to choose the one they wished to use. The human-to-human interaction and shared reflections are vital to the process. Disco (2025)

contends that social learning environments paired with digital tools can help not only students' retention and motivation, but also their empathy for others. At the same time, thinking of AI as a partner rather than a tool for cheating, can open up a new world as students can discuss and evaluate the contributions of their virtual team member. Regardless, the reflection upon the good and the not-so-good, the ethical and the I-don't-think-that's-quite-right, and the I-liked-this-but-that-is-even-better is essential to the process.

Interaction with teammates and both individual and group reflection help students understand what they have done as well as why and how. Journals or diaries can help individuals gather insights about themselves and the roads they are traveling, increasing their self-awareness and improving their judgement (Hagg, 2011; Rae, 2007; Westad Brandshaug & Engen, 2023). In an age when AI could easily write opinion pieces to be copied and pasted into a paper or an online submission system, hand-written journals and diaries can encourage students to sincerely write down their own reflections rather than writing out (even by hand) the words composed by AI. The very act of hand-writing slows students down so they have more opportunity to think about what they are writing.

Traditional classroom assessments sometimes create a "disposable" attitude toward knowledge—assignments are completed for the sake of compliance and the material is retained just long enough to earn a grade. Students metaphorically open up their heads and dump the information into the garbage can on their way out the door. In contrast, deep learning fosters internalization, transformation, and long-term utility. By embedding reflection and interpersonal exchange into the mix, FLAIR increases the chances that learning is not only retained for a longer time but that learning itself is viewed as a life-long activity (Westad Brandshaug & Engen, 2023).

CONCLUSION

Some approaches to technology in education cast AI as a villain: simply another method for cheating. Students delegate their work to AI and then submit it as their own creation. The FLAIR model views AI as a partner to be consulted after students have made a first attempt at completing work. It relies on the flipped classroom method to assure that students creatively engage with each other before consulting AI and then work together to compare their results and push the project on further to completion.

This paper proposes a shift from control to collaboration by framing AI as a virtual team member—an entity that can assist with many tasks. Like human team members, AI is not perfect and has its own share of weaknesses that must be considered. By interacting with other humans before consulting AI, the focus is maintained on students rather than on technology. It is suggested that the AI virtual team member is most beneficial when a very large (semester-long) project is created as students can learn to use the technology for a variety of uses.

As they work with AI and learn what they themselves can accomplish when assisted by this virtual team member, students grow in confidence. What once felt impossible now feels plausible. Self-efficicacy is a key variable in entrepreneurial intention is self-efficacy (Hu & Zhao, 2021). Similarly, students with higher perceived control are more likely to follow through with entrepreneurial projects (Raab, Strebinger, & Muehlbacher, 2018). Kaufman (2021) attests that

ambiguity can prompt students to stop, but those who are encouraged to wrangle with open-ended problems become more resilient and innovative, which are highly important qualities for entrepreneurship and life in general. When students learn that they don't have to go it alone, but can obtain help from AI, they begin to gain confidence and think, "I really could do this."

Successful entrepreneurship requires a great variety of skills from creative ideas to artistic marketing to quantitative analysis of markets and finances. Given the range of skills used in entrepreneurship and the rather low percentage of students who start businesses immediately upon graduating, entrepreneurship education should be evaluated not solely by venture creation, but by broader competencies such as opportunity recognition, creativity, resilience, and strategic thinking (Envick, 2023; Kennedy et al., 2023). Similarly, the FLAIR framework can be explored across multiple disciplines. While initially designed for entrepreneurship education, the guiding principles of interpersonal interaction, reflective practice and AI augmentation could enhance creativity and innovation in many areas.

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INTERDEPENDENCE AND PERFORMANCE EVALUATION FOCUS' INFLUENCE IN BUDGET NEGOTIATION STRATEGY SELECTION

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ABSTRACT

This paper presents the results of an experiment testing how two structural organizational factors influence information sharing within a budget negotiation. Budget research indicates firm leadership attempts to overcome information asymmetry between principal and agent by inviting agents to participate in setting budget targets through the process of budget negotiation. Critics of traditional organizational budgeting suggest the practice incentivizes gamesmanship and the creation of budgetary slack. Results of this study suggest the interaction of greater accountability through budget target focus in performance evaluation and the presence of interdependent organizational units prompts greater information sharing through the use of integrative negotiation strategies.

A SOCIAL JUSTICE EXERCISE FOR SEGMENTATION: USING DESIGN THINKING

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ABSTRACT

In Business classes it is often a challenge to include social justice issues. This is the abstract of a paper that focuses on how to include social justice when learning about segmentation. It is one way but having used it in classes it works well. It is usually a revelation to students. Most students have not studied the homeless population or know little about it beyond those hanging out at the park or on streets by day. Students are surprised to see that this group too, is heterogeneous and can be divided into homogeneous segments. The challenge of developing a product for each segment has proven a great learning tool.

It works really well with the Stanford Design thinking model. The students are put in six groups. Each group has several large sheets of paper. Students are first given a little background of the 21 books that have supported the development of these segments. A brief discussion of the importance of learning to empathize with your customers or clients. Among the facts that the author points out are the following.

- *Most of us do not know about the homeless*
- *Park homeless are the tip of the iceberg*
- *Drug use leads to homelessness or*
- *Homelessness leads to drug usage*
- *Not all homeless are broke – Many have incomes*
    - *Inadequate for today's cost*
    - *Inadequate to accumulate a deposit*
- *Over 1.8 million children in school do not have a home to go home to.*
- *Many elderly are homeless due to family, economic, and medical events.*
- *Many homeless want to work.*
    - *Many lack transportation*
    - *Shelters often have rules that mean the homeless have to be on the move.*
    - *Public transport*
        - *Can be expensive*
        - *Not always easy to use to get to work*

After this discussion, each team is given a handout with one of the homeless segments and some information about these segments.

The segments are as follows:

- *Seniors*
- *Families with older children – 6th grade and up*
- *Young families that are not working – children age 0 to 11*
- *High school students*
- *Veterans that you might see in the park or on the street*
- *Nonveterans that you might see in the park or on the street*
- *College students*

Each sheet contains some information. The student groups are challenged to use their smart phones and computers to get more information quickly. For many of them it is a shock to learn what a high percentage of university students have housing and food insecurity. In one class this has led the class to think about how they can pass more of the leftover food after class dinners for others. Usually this does not need to be to long maybe 15 minutes. Stressing empathy and understanding.

Students are asked to put their findings on one of the big sheets so that they can refer to them later. This is important as it is ideal if they can work through this segment exercise and at the same time get an introduction to or refinement in Design Thinking. This is empathy.

Next students are asked to define a problem for their segment. Of course there are lots of problems, but the idea is to develop a product of some sort, so they need to define a problem for their segment. The segments turn out to have different problems in the way that teams think about them.

Definition is part of the Design Thinking Process as well and really helps with ideation. A clear definition will generate more and better ideas.

Once the definition of the problem is established the ideation can begin.

Students need perspective so the author gives them a little.

Produce ideas for products to help this segment – Define or state your problem in the center of a sheet – Now try to brainstorm 50 ideas. Ideate

- *There are many services out there*
- *Getting into a shelter is not always easy*
    - *You have to be homeless*
    - *There are sobriety and medical questions*
    - *There are drug use questions*
    - *You may not be able to enter as a family group etc.*
    - *In most shelters, people have to leave by a certain time say 8:00 AM and then can return late in the day say between 5 and 7.*
- *When you have a big pile of ideas reduce it to five being careful to keep the craziest one.*

It is a good idea to tell them that you do not expect any talking, criticism, or painful grunts as every idea is a promising idea. It is good to tell them that the craziest idea is often the best idea.

One way to generate a large number of ideas is to count members on a team and then if there are five tell them in five minutes you expect 50 ideas on the paper. You should have each group count how many ideas they have on their sheet. It is good to have a prize for the most ideas.

When the groups are through with their ideation and counting, then have them select the best idea for their segment in draw it . in detail.

- *Make it large so the class can see*
- *Make it dark so it is visible*
- *Make it fun looking for the homeless person(s) who might purchase*

The share out at the end of class is particularly important to the full process. They present the following:

- *Introduce your teammates*
- *Your segment*
- *The problem you defined*
- *Product idea*

Below is a sample of an information handout on Seniors

1. ***Seniors*** *– predicted to increase dramatically with inflation.*
    a. *Economics --*
        i. *Insufficient income to maintain a house or apartment*
        ii. *Usually lived through their resources*
    b. *Cars/Vans/Trucks*
        i. *Often a methodical choice*
        ii. *Inevitable if insufficient funds*
    c. *Nomadic life*
        i. *Campgrounds and parks are expensive*
        ii. *Where to spend the night*
            1. *Safe from predators*
            2. *Bathroom facilities*
            3. *No harassment*
    d. *Follow the weather*
        i. *What to do with weather extremes?*
            1. *Challenges of sleeping in your car at 95degrees*
            2. *Challenges of sleeping in your car at 5 degrees*
            3. *Challenges of sleeping in a car*
        ii. *For the elderly heat can be as dangerous as cold*
    e. *Work together in community*
        i. *Help each other repair or add things to their cars and vans*
        ii. *Share meals, potlucks.*
        iii. *Share campfires*

f. Often with a pet
    i. What are challenges of a pet?
    ii. What are opportunities of a pet?
g. Family is usually not engaged or may not exist
h. Need inexpensive tech to make life easier

Can you help our seniors who can no longer afford housing in the community they have known and are having to move into their vehicle?

AI DIVIDE IN THE INTELLIGENT AGE: THE VIEW OF COLLEGE STUDENTS FROM UNDERREPRESENTED GROUP

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ABSTRACT

Artificial Intelligence (AI) is going to transform the economy and the lives of people around the world in this intelligent age. To fully harness AI, everyone needs access to the technology, AI tools, education and infrastructure that underpin it. However, the rapid development and advancement of AI become a double-edged sword in terms of widening and bridging the digital divide by creating the AI divide where unequal access to AI technologies intensifies existing inequalities, particularly for underrepresented groups, and by also offering tools for digital inclusion through personalized learning and skill development if the equal AI technologies and literacy access guaranteed. AI is the promising booster to the global economy by potentially adding $2.6 trillion to $4.4 trillion to it annually (McKinsey, 2025); however, AI's disruptive nature can't be ignored including its impact to people's career, lives and communities, especially to those who have already been left out of the global digital economy. This study investigates the AI literacy of students in a HBCU college in the south of the United States. It focuses on the college students' awareness of AI technology, AI applications, and attitude towards AI. The preliminary data will be collected via survey. The analyzed data results will be further studied by interviewing focus groups. The study results will provide policy makers and college administrators with insights of the underrepresented group's view of AI, how to bridge the AI divide, and integrate AI education into curricula in colleges that has limited resources.