Searching for a better segment: segmentation of student body through the use of online search data to improve university enrollment.

An Action Research Inquiry

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By

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Abstract

The University of Akron, a public higher education institution, located in Akron, Ohio, USA identified a problem regarding a decrease in enrollment and recognizes the importance of online marketing because of changes in consumer behavior, especially those that happened during the isolation due to COVID-19. The research aimed to develop a segmentation model that can be used based on consumer behavior online. Recent research findings have reinforced the importance of search query volume (SQV) data to create segments based on a given interest and better understand consumer behavior. Consequently, there is an ongoing practical need for and research interest in the effective use of search query for management decisions. To improve the use of search query data within an organization, companies have begun to put practices in place that analyze and forecast search queries data in the hope of achieving a better forecasting model.

While this phenomenon has created a lot of interest, it has hardly been the subject of serious investigation guided by research questions and executed research methodologies. In particular, hardly any insights exist into the higher education use of search query data for better management of student enrollment. To explore such activities in a systematic way, this thesis turns the attention to the enrollment data within the University of Akron for identifying relevant patterns of student enrollment and linking them to search query volume. This is accomplished through the use of enrollment data obtained from the Institutional Research at the University of Akron, and action learning sets which serve as ways to gather feedback, collaboration, and direction based on research findings.

To achieve the link between student enrollment data and search query volume data, relevant keywords are identified, and search query volume data is collected through the use of Google Trends. The results show that we can break down the prospective students based on their online search behavior and geo-locations. There are opportunities to optimize our marketing efforts on specific keywords based on the home location. It is also quite important to consider demographics associated with these keywords, as they tend to provide a better direction on what type of content should be associated with those search phrases. Men tend to look for content proving that the University and/or its programs are top or the best, while women are searching

for benefits beyond being the best. But most importantly, it also provides an opportunity for the university to further improve its diversity efforts. Understanding which search phrases will provide a higher reach to men vs. women, allows us to make sure that we are balancing out our marketing efforts, and continuously increasing our reach to diverse groups of potential students.

Keywords: analytics, segmentation, marketing, digital, advertising, education

Declaration Statement

I hereby confirm that this thesis represents my own work which had been created independently with the direction and feedback of my primary advisor, Dr. David Fogarty. Before writing this thesis, I published a journal article in the *Journal of Interactive Advertising* and a chapter in *Digital Advertising. Theory and Research* book, which influenced my overall direction for the thesis. Where others' work was used, appropriate citation and referencing were utilized.

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1 Introduction

1.1 Introduction

According to the National Center for Education Statistics' "Report on the Condition of Education 2022" (June, 2022a), college enrollment in the United States had already been decreasing prior to the pandemic. The decrease in the number of students enrolling in undergraduate programs started in 2011, and by Fall 2019, the decline had resulted in more than 1.5 million fewer students (June, 2022a). According to Cui and Robinson (2022), although there has been a decrease in higher education enrolment throughout the US over the last decade, this is mostly noticeable in the Midwest and Northeast regions. Between 2010 and 2020, Ohio, a state known for its prominent higher education institutions, saw a significant decrease in overall enrolment by 30% (Cui & Robinson, 2022),

Concerns have been raised by a variety of stakeholders about the decrease in college enrollment among young adults, especially those aged 18 to 30 (June, 2022b). According to Cui and Robinson (2022), the reasons for this decline can be attributed to a number of factors such as a declining population of high school graduates, lower birth rates, depopulation, and increasing tuition costs. In 2022, a study was conducted to better understand the reasons behind individuals choosing not to pursue higher education or quitting college (June, 2022b). It was found that 40% of the participants identified the expense of attending college as their primary challenge, whereas 20% expressed the belief that pursuing higher education is not beneficial. According to the study, nearly half of the participants (47%) chose to take courses on platforms like YouTube, indicating a significant shift in the educational environment (June, 2022b). Surprisingly, achieving emotional well-being and financial stability had been deemed more important than obtaining a college degree (June, 2022b).

Although enrollment across colleges was already on decline, it was intensified by the pandemic (Cui and Robinson, 2022). The uncertain landscape brought on by the pandemic had students questioning the importance of obtaining a college degree and considering alternative paths that provide better starting salaries and more jobs that are in high demand (Cui and Robinson, 2022).

In Fall 2021, college enrollment in the US declined by 2.7%, or 476,100 students, compared to the previous year (June, 2022c). Further on, undergraduate enrollment dropped by 3.1%, or 465,318 students, and has decreased by over a million students since 2019 (June, 2022c). The decline in enrollment has specifically occurred amongst the five largest undergraduate majors: business, health, liberal arts, biology, and engineering, with liberal arts seeing the most significant decline at 7.6% (June, 2022c). When looking at specifically what type of colleges have seen the most decline, it is the community colleges that were hit the hardest, experiencing a 3.4% drop in enrollment in fall 2021, losing over 700,000 students since 2019 (June, 2022c). Community colleges had already seen a 25% decline in enrollment from 2011 to 2019, and a 12% drop in Fall 2020, compared to the previous year (June, 2022a).

The pandemic has made people most skeptical about the value of college education, which has led to concerns about the future of higher education (Conley & Massa, 2022). The overall emphasis for colleges and universities should be on adapting creatively and proactively to address the challenges the industry is faced with (Conley & Massa, 2022). What has been interesting to see is that while the overall numbers for undergraduate programs have been declining, there has been an unexpected rise in graduate education (June, 2021). Graduate enrollment at baccalaureate colleges increased by nearly 10%, master's colleges saw a 7.6% increase, and institutions with at least 75% online graduate students experienced a 9.6% rise (June, 2021). In particular, we are starting to see the shift towards short-term certificate programs which is attributed to students seeking quicker pathways to employment (Knox, 2023).

According to the National Student Clearinghouse Research Center, we are now starting to see enrollments in colleges and universities stabilize after a significant decline during the pandemic (Knox, 2023). However, the overall enrollments have not recovered to pre-pandemic levels, with nearly 1.2 million fewer students than in 2019 (Knox, 2023). Rising tuition costs, student debt concerns, and doubts about the value of higher education are hindering a complete recovery (Knox, 2023). Demographic shifts and the changing preferences of students require colleges and universities to adapt to a new landscape and develop proactive strategies to attract different types of students (Knox, 2023)

1.2 Problem Statement

In recent years, universities in the United States have experienced a concerning drop in enrollment, which poses an interesting challenge to higher education institutions and the overall sustainability of the industry. This downward trend has driven a critical need for innovative strategies to understand and address the factors contributing to this decline. It is equally important to understand the various elements that are required to adjust within universities to effectively navigate and overcome these challenges.

Enrollment in U.S. colleges and universities has continued to decline, with 662,000 fewer students in spring 2022 compared to the previous year, marking a 4.7% drop (Camera, 2022). This negative trend affected both male and female students, but the decline was more significant among male undergraduates, decreasing by 5% from 2009 to 2019 (June, 2022a). The pandemic intensified this decline, with a 7% drop in male undergraduates in 2020 compared to the previous year. This statistical evidence underscores the urgency for research into the underlying reasons behind the drop in enrollment, particularly as it relates to changing demographic preferences and adjustments needed to be made to effectively navigate these challenges.

The general problem in the higher education industry is the continuous decline in university enrollment, which has become a prevalent and persistent issue impacting institutions around the country. This continuous decline raises questions about the evolving dynamics of student decision-making processes and the factors that influence their choices regarding higher education. It also raises the question of a personalized marketing approach based on segmenting students from a geographic and demographic perspective. The sustained nature of this decline over many years further intensifies the challenge, making it increasingly difficult for universities to envision a sudden return to the enrollment levels observed in the past. Addressing this issue requires a comprehensive understanding of the prolonged trends and a commitment to implementing strategies that not only stop the decline but also pave the way for sustainable growth in the future.

A more specific aspect of this problem is the shifting geographic and demographic preferences among prospective students. Understanding how these changing preferences correlate with

enrollment trends is crucial for universities seeking to adapt their recruitment strategies effectively. This study aims to investigate the role of Google Trends Analysis in providing insights into the evolving interests and priorities of potential students, thereby informing recruitment efforts.

The existing literature predominantly focuses on general enrollment trends and demographic shifts, but there is a noteworthy gap in understanding how digital tools, specifically Google Trends Analysis, can be utilized to gain real-time insights into the online behaviors and interests of prospective students. This study aims to fill this gap by exploring a new approach that leverages Google Trends data to inform and optimize university recruitment strategies. By adopting a digital analytics perspective, this research intends to offer a unique contribution to the literature on enrollment management, presenting a fresh and data-driven perspective on addressing the challenges faced by higher education institutions in the 21st century.

1.3 Purpose of the Study

The purpose of this action research study is to address the declining enrollment trend by utilizing Google Trends to gain insights into the changing dynamics of students' preferences. The country is faced significant challenges faced by both the labor market and higher education due to the Great Resignation and the pandemic-induced disruption in college enrollments (Conley & Massa, 2022). In the labor market, approximately 25 million workers left their jobs in the second half of 2021, raising questions about work preferences and employer strategies (Conley & Massa, 2022). By analyzing search trends, demographic, and geographic factors, the goal is to identify key segments within the student population. The insights will guide strategic recruitment efforts, allowing universities to be more effective and efficient with the outreach and recruitment strategies. By better meeting the diverse needs, the aim is to reverse the enrollment decline by creating a more targeted and responsible approach to recruitment efforts.

1.4 Rationale for research

College enrollment has been declining across the county over the past decade, however, particular drop has been seen in the Midwest and Northeast regions (Cui, C., & Robinson, P.

2022). Student enrollment at colleges and universities across the Midwest has seen an approximate 15-20% decline over the past five years (Fain, 2018). This trend has continued, and Ohio has experienced a 30% drop in total enrollment from 2010 to 2020 (Cui, C., & Robinson, P. 2022). Declining enrollments have been particularly high amongst low-income students, Hispanics, and men (Conley, B., & Massa, R. (2022). According to The University of Akron, Ohio (2020) Institutional Research enrollment data, the University has seen about a 15% decrease every year for the past five years, while the College of Business has seen an approximate 7% decrease every year.

Enrollment managers, program directors, online learning directors, deans, and committees of faculty tasked with program growth can utilize the insights from this research to further refine and enhance the value of their initiatives. The findings from this action learning study offer a valuable point of reference, enabling these stakeholders to make informed decisions regarding program enrollment and expansion, student engagement, and curriculum development. This knowledge from this study is not restricted to academia; it can span across multiple industries, providing a framework for small and medium organizations' owners and managers focusing on customer relationship management and acquisition. Likewise, in large organizations, customer acquisition and marketing teams can draw upon the study's insights to optimize their approaches. The overall research contributes to professional advancement across organizations by fostering data-driven decision-making, ultimately leading to more effective program development and organizational growth. It serves as a foundational resource for individuals and teams seeking to innovate and improve outcomes in their respective fields.

The results of this research hold significant potential for improving the world of practice and expanding the body of knowledge in applied research. By offering enrollment managers, online learning directors, deans, and faculty committees a comprehensive understanding of effective strategies for program growth and student engagement, the study equips them with actionable insights to enhance their professional practices. The results of this research offer stakeholders a robust, data-driven approach that has been tested through action research insights. This involved the implementation of multiple small campaigns, followed by the analysis of results to distinguish effective strategies. This iterative process not only informs enrollment managers,

online learning directors, deans, and faculty committees about what works and what doesn't in program growth and student acquisition but also provides a replicable methodology for other professionals. The broad scope of potential applications positions this research as a versatile resource capable of driving innovation and improvement across various fields, contributing not only to the refinement of current practices but also to the expansion and enrichment of the broader body of applied research knowledge.

1.4.1 Impact of Covid-19

By late April 2020, at the time of writing my dissertation, countries across the world were impacted by the Coronavirus disease 2019 (COVID-19) pandemic. COVID-19 is an infection (SARS-CoV-2) of the lower respiratory tract, detected first in Wuhan (China) in late December 2019 (Ashour et al., 2020). Since then, the number of cases have been increasing globally each day (John Hopkins University, 2020). Around the time World Health Organization (WHO) declared the COVID-19 outbreak a global pandemic, almost all countries implemented lockdowns, shutting down activities, schools, offices, airports, and many other functions that required human interactions. Due to social distancing and national lockdowns, the COVID-19 pandemic has led to an increase in the use of digital technologies. According to De', et al. (2020), internet services have seen major increases in usage, 40% to 100% increase, compared to pre-lockdown uses.

Di Crosta, et al. (2021) argue that COVID-19 is more than just a health crisis, it has heavily impacted societies and economies. COVID-19 changed the way humans see the environment, how we perceive and how we live, which is completely different from what any other global incident has done (Alshaketheep, et al., 2020). COVID-19 has also taught us the importance of short-term messaging and planning, as it has been very important to be pro-active in messaging and customer acquisition initiatives (Alshaketheep, et al., 2020). Even the relationship between the buyer and the supplier has changed, some of the trends surrounding the use of internet, smartphones and social media marketing that were happening were escalated to a much higher level during the pandemic (Alshaketheep, et al., 2020).

The World University Rankings (2022) discusses the impact of COVID-19 outbreak on universities and colleges, but more specifically highlights the challenges faced by the higher education system across the world. Class cancellations, shifts to online learning, and travel restrictions have been major disruptors to the traditional academic environment (The World University Rankings, 2022). The pandemic forced colleges and universities to make a fast shift to online-only courses, which led to many financial uncertainties across the universities and challenges in providing a complete learning experience (DePietro, 2020). The indication is that there are potential long-term changes in the higher education system, including increased accessibility through online programs (DePietro, 2020). The financial difficulties in higher education can be seen, with universities across the world reassessing their budgets, implementing cost-cutting measures, and facing challenges in attracting and retaining students (DePietro, 2020).

Due to COVID-19, international efforts in higher education have been one of the most impacted areas (Knox, 2022). During COVID-19, universities saw a 46% drop in new international students and a 15% drop in total international enrollment in higher education institutions across the US, during the 2020-21 academic year (Knoc, 2022). Despite the uncertainties and challenges, institutions in higher education have remained committed to internationalization, with many institutions still planning on increasing their internationalization efforts (Knox, 2022). Looking ahead, international partnerships have become an extremely important tactic to bring in revenue and diversify perspectives (Wubah, 2023). The economic contributions of international students to the U.S. economy are an extremely important factor to note and by forming relationships with international institutions, both the U.S. and international students benefit (Wubah, 2023).

The pandemic prompted higher education institutions to reevaluate and broaden their approach to internationalization beyond just the physical aspect (Knox, 2022). International students may face additional hurdles, including visa restrictions and time zone differences, impacting diversity and financial strain on institutions (DePietro, 2020). During the pandemic as there were not many opportunities to travel internationally, the universities increased investment in training faculty to enhance the international aspect of the curriculum, putting attention on making courses

more globally focused (Knox, 2022). This shift towards innovating ways in which internationalization can be further incorporated into curriculum and programs reflects a realization that internationalization extends beyond physical mobility (Knox, 2022).

Looking ahead, diversifying internationalization efforts across multiple countries is a recommendation, with India emerging as a key partner for the future (Knox, 2022). It is important to acknowledge that challenges will not go away, such as the decline in support for international efforts and the high costs of education in the U.S. (Knox, 2022). Despite the uncertainties and challenges, the higher education sector can withstand the crisis, when properly equipped with digital tools (DePietro, 2020). The key for higher education institutions is to think of ways in which they can adopt innovative ways to internationalize through digital tools and virtual learning (Knox, 2022). Investment in digital platforms increased significantly during the pandemic, with a rise in virtual internships and global exchanges, offering new opportunities for students and facilitating collaboration between institutions (Knox, 2022).

COVID-19 has brought significant challenges and uncertainties to the higher education, which has affected various aspects of institutions' operations, finances, and student experiences (DiPietro, 2020). The financial aspect of challenges brought on by the pandemic is significant, as it is predicted that students will be faced with larger loans, due to reductions in merit and need-based aid, and fundraising for institutions is predicted to decrease as donations from alumni and parents will continue to be lower (DiPietro, 2020). Institutions must adapt to the changing landscape and navigate uncertainties that will continue to face the higher education industry brought about by the COVID-19 crisis (DiPietro, 2020). Further on, Ellis, et al. (2022) discuss trends that have gained prominence due to the COVID-19 pandemic and increased awareness of class disparities in the U.S. Legacy preferences in admissions, a long-standing practice where qualified children of alumni receive an advantage during the admission process, have faced scrutiny (Ellis, et al., 2022). We have started to see colleges eliminate this practice in efforts to promote diversity, but critics argue that this alone will not eliminate racial inequality in admissions (Ellis, et al., 2022).

The challenges and uncertainties brought on by COVID-19 are not only impacting higher education institutions but the overall society as well. The trend of decreasing enrollment has affected both male and female students, as well as private and public institutions, but we are seeing a significantly higher decline among public institutions, men, and minorities (June, 2022a). Black freshmen enrollment decreased by 6.5%, resulting in an 18.7% decrease since 2020 (Camera, 2022). Male undergraduate enrollment decreased by 5% from 2009 to 2019, and during COVID-19 we saw a 7% drop in male undergraduates in 2020 compared to the previous year (June 2022a). The Biden administration is addressing these challenges by creating initiatives like loan forgiveness, Pell Grant increases, and aid for historically Black colleges (Camera, 2022). However, staffing shortages across the board and in financial aid offices are posing additional hurdles, potentially affecting compliance and student services (Camera, 2022).

Not surprisingly, the higher education industry has also seen major disruptions that will continue to impact the industry in the years to come. Some trends will slowly vanish away while the majority are here to stay post-pandemic. From changes in course delivery, and advertising strategies to enrollment challenges, the industry is set to make changes and face challenges during and post-pandemic. This next section will evaluate the overall state of The University of Akron is currently in.

1.4.2 The University of Akron at a Glance

Over the years, the nationwide enrollment crisis has led universities into stressful financial situations. With the added pressures of the COVID-19 pandemic, the higher education institutions have become even more strained, focusing on slashing their budgets, decreasing program offerings, laying off staff and faculty, and some eventually even closing their doors. Financial Fitness Tracker done by The Hechinger Report is a widely utilized analysis that scores public four-year universities, private, nonprofit four-year universities, and public two-year colleges with enrollment above 100 students. The report is based on the book “The College Stress Test,” written by Robert Zemsky, Susan Shaman and Susan Baldridge. A total of 2,264 institutions were analyzed for this analysis, and all of the data taken into consideration was pre-pandemic.

The score that I will be discussing in this thesis shows the estimated amount of financial stress on the University of Akron after the 2019-20 academic year, without necessarily attempting to quantify the still-uncertain effects of the Covid-19 crisis. The four categories that are used in order to assess the financial stress on the University of Akron are change in enrollment of first-time undergraduate students, retention rate, change in the average tuition and fees revenue per student, and change in state appropriations. The values are based on the publicly available data over eight years, with the rate of change in most categories being calculated to see whether a school should be given a warning.

The report categorizes the University of Akron with a warning sign, as it relates to enrollment (Figure 1). This report further confirms that enrollment has been a major problem at the University of Akron and is projected to be an even bigger problem in the near future. Hence, an opportunity and a need to make improvements to current processes put in place.

Figure 1: The University of Akron Stress Scores
Source: Zemsky, Shaman & Baldridge (2020)

More specifically, undergraduate enrollment at the University of Akron has seen a decline since the 2009-10 school year and has fallen below the warning level in the 2019-20 school year, as demonstrated by Figure 2. This demonstrates that the University of Akron is projected to fall below the 20th percentile in the enrollment category. Retention at the University of Akron has seen some decline but has shown promising numbers within the last couple of years, in particular, projections are outside of the alert levels. Average tuition per student has increased over the years and is projected outside of the warning sign levels. Finally, state appropriations have declined significantly for the university, but still compared to other institutions, it is projected to be outside of the warning level.

The overall report shows dozens of universities nationwide had started off the year under financial stress. Over the years, universities across the United States have experienced declining enrollments and lower amounts of support from state governments. With the added pressures of the coronavirus pandemic, the higher education environment has seen many shifts and budget cuts in this past year. The report looked at how each institution was positioned to take on such a challenging time, examining key metrics associated with a higher education institution. Overall, Ohio was among one of the top states which had a significant number of institutions that are facing trouble, by showing two or more warning signs. Ohio has 36 institutions that are facing trouble, with two or more warning signs. This brings on an additional challenge for the University of Akron, not only is the institution in a highly competitive state but is also in a state that has the highest number of troubled institutions. However, because the University of Akron is not an extremely troubled institution in Ohio, as it is not weak in more than one area, there is a promising future to improve and an opportunity to continue providing value (Figures 2-5).

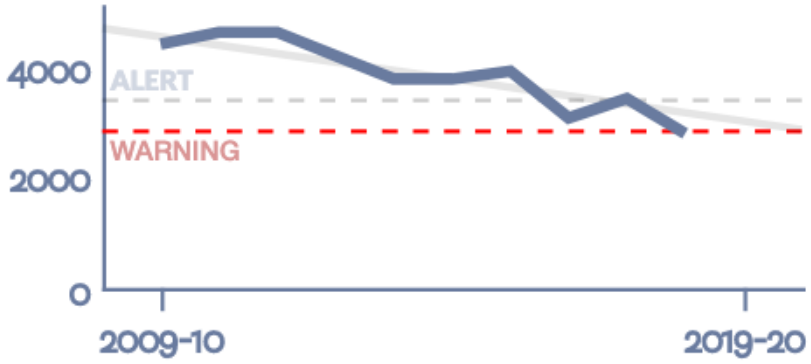

Figure 2: The University of Akron Enrollment
Source: Zemsky, Shaman & Baldridge (2020)

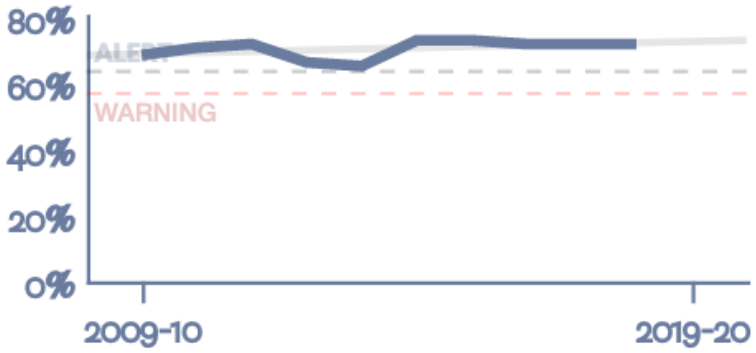

Figure 3: The University of Akron Retention
Source: Zemsky, Shaman & Baldridge (2020)

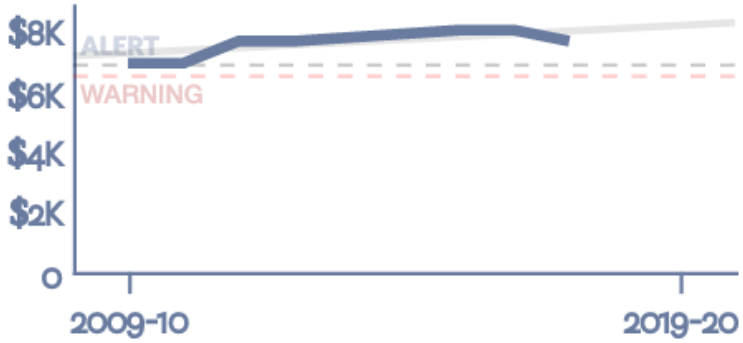

Figure 4: The University of Akron Average Tuition
Source: Zemsky, Shaman & Baldridge (2020)

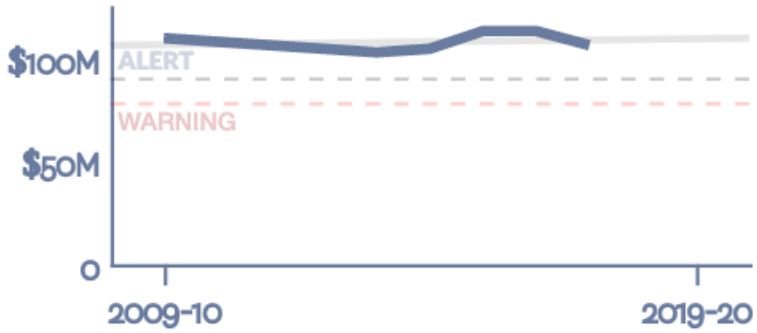

Figure 5: The University of Akron Appropriations
Source: Zemsky, Shaman & Baldridge (2020)

1.4.3 Interactive Advertising

When it comes to better understanding and mastering digital marketing skills through training and implementation, it appears worthwhile to have a closer look at digital marketing practices within organizations. The idea of turning to digital marketing to gain insights into recruitment and customer acquisition is not a new one. Automobile dealerships have used it to predict automobile sales, states have used it to predict unemployment claims, and travel agencies have

used it to predict the demand for travel destinations and consumer confidence regarding those destinations (Choi & Varian, 2012). However, while such predictions may prove useful in some industries, they do not represent an equal effort put on by most of the industries. This is not to say that there is no research about digital marketing within higher education, but these reports merely talk about a broad range of marketing tactics. The impact of forecasting of student enrollment is important to properly determine budgets, determine offerings of programs and services and to set proper staffing levels (O'Bryant, 1991). Limited data analysis related to online consumer behavior restricts a university from adequately planning.

Due to technology disruption and major advances in the digital environment, the Journal of Interactive Advertising (JIAD) was founded in the fall of 2000 to be able to explore and understand the new and emerging aspects of the digital age (Leckenby & Li, 2000). Interactive advertising was first defined by Leckenby & Li (2000) as any paid or unpaid promotion of products, services, or ideas by an identified sponsor to consumers, and the vision of the authors was that the time of traditional marketing was coming to an end, and a more involved and in-control consumer was in charge. In 2017, I co-authored a book chapter and a journal article analyzing articles within this journal. We identified that most articles within this Journal, (29%) examine internet advertising broadly, followed by social media (15.6%), gaming (10.2%), and interactivity (5.4%) (Daugherty and Djuric, 2017). The trends show internet advertising growing until 2006, followed by social media immediately after that (Daugherty and Djuric, 2017). In the most recent years, we do see the trend of eWom and mobile growing, hence showing a continuous evolution of interactive advertising (Daugherty and Djuric, 2017). Daugherty & Djuric (2017) also find that articles surrounding measurement and privacy are scarce within this journal. This shows a gap within literature as it relates to utilizing tools such as Google Trends to measure success and efforts across the digital marketing for organizations such as The University of Akron.

1.4.4 Forecasting

The application of forecasting is gaining steady momentum among for-profit and non-profit organizations. Rakhimov & Kankarej (2015) define forecasting as an estimation of some variable

of interest at some specified future date. Over the past decade, there has been a strong academic interest in developing better forecasting methods (Song & Li, 2008). With more accurate demand forecasting, companies will be able to develop strategic marketing plans that can explore and take advantage of future markets along with their current ones (Song, Witt, & Li, 2009). As a method to improve forecasting, there are several sources of data that provide real-time economic activity available from companies such as Google (Choi & Varian, 2012). Since the beginning of January 2004, Google has started collecting data on the number of searches for keywords and/or key phrases individuals use when surfing the web. Google can provide a daily history of the number of searches for a particular search term and can restrict the results to a particular geographic region.

As a university that strives to increase its enrollment, we have witnessed an increasing awareness and demand for improved understanding of who the target market is and how we best communicate to them among the various departments on campus. Since 2016, we have received numerous requests from the administration for more regular updates on enrollment projections. During the past couple of years, the university has received extensive data capturing and analysis services from a third party, which focused mainly on targeting a certain set of students based on their standardized test (SAT/ACT) scores and geographic proximity. In addition, the university has strengthened its social media team in support of its outreach and retention strategies.

Demand in the higher education industry is heavily driven by word of mouth (Briggs & Wilson 2007); with online information search and eWom (electronic word of mouth) being just as important (Galan et al. 2015). While the University of Akron can access the new generation of students in a cost efficient and timely manner, the organization is not able to properly market itself to new students without further understanding their changing and event-triggering consumer behavior. This can be solved by integrating Google Trends into the process of better understanding and predicting university enrollment. Google Trends will enable us to discover trends and event-triggering spikes in keyword search volume associated with university enrollment.

However, there are many barriers to develop and use Google Trends as part of a forecasting model across various departments. As the stakeholders of change are very diverse (top administration, faculty, staff, and current students) reluctance to change exists amongst the stakeholders, controversy of the importance of online data in a traditional university environment exists and there is a lack of skillset needed to collect and analyze the data across the university.

Therefore, development and integration of Google Trends as part of forecasting could trigger some organizational change, which will need to be managed by a change agent. A change agent is an individual or a group that takes on the task of initiating and managing change within an organization (Tschirky, 2011). The identification of a change agent will be based on a few different factors and skills the individual possesses, such as current leadership roles, current successes in inspiring and influencing others, and their vision and understanding of the benefits for this research.

The initial step of implementing and testing some of the ideas from this research will be using change agents within the College of Business Administration, which will serve as a pilot test for other departments across the university. The issue that I will run into is that change agents tend to vary a lot across campus, and their characteristics tend to be dependent on the department they are within. As the departments work in silos, the idea behind collaboration and interaction among all the stakeholders is going to be limited (Raelin, 2010). However, using sensemaking, I intend on observing and identifying the various characteristics of change agents, while better understanding the data and myself as a researcher.

1.2 My Role in Research

As the Director of Analytics, one of the key initiatives at the University of Akron, and as the Director of Suarez Research Laboratories, I am in one of the primary roles to research the topic of enrollment, as I am in dual Director roles at two of the centers and institutes that were built in order to provide experiential learning to students, in an effort to eventually improve retention and enrollment. Moreover, I am active at recruitment events representing the opportunities offered through the centers and institutes and focus on providing an insight to potential students on learning experiences they will receive outside of the classroom. For example, I am responsible

with providing students on campus jobs such as the one located in the call center and as a research assistant at the Taylor Institute for Direct Marketing and Suarez Research Laboratories. As one of the key goals of centers and institutes is to increase enrollment and improve retention, low enrollment reflected on me, and I wanted to make sure I have an influence on any change that needs to happen.

Key initiatives that centers and institutes are directly involved in tend to be related to specific times of the year, such as application months and yield months. Applications months refer to the time when students are applying to various universities and yield months refer to months between February and May, when students have been accepted and are in the process of choosing where to put their deposit and ultimately enroll. The two institutes that I am associated with are out of the Department of Marketing, and their core focus is providing services to students and faculty within the digital marketing domain, which directly relates with the initiatives surrounding the use of search query analysis. I also earned a Master of Science in Information Systems and a Master of Business Administration and finished with, which provides me with a great balance of management and technical abilities.

My academic experience as a DBA student, coupled with my professional position have made me a more conscious member of the community and a better leader. For example, I am better able to analyze the process of identifying the right problem. I have started to consider alternative theories, approaches, but more importantly limitations to each, with an understanding that there is not a single perfect way for any situation. Most importantly, I have started to evaluate new concepts by utilizing new structured processes and have started to utilize understanding of my own thinking. I am also involved in leadership meetings at the College and University level, which help me collaborate and share practices with others who have a direct impact on the enrollment initiatives within the organization. In addition, I am involved in daily virtual conversations with stakeholders on a platform called Slack, a collaborative tool for the workplace environment communication. I utilize the tool to present new concepts, knowledge, and any relevant action, while receiving immediate feedback.

Being in one of the highly respected positions at the university, Director of Analytics, that oversees a lot of project elements related to the use of analytics for innovative marketing strategies, I had an opportunity to propose changes and influence the way future decisions will be made. Also, because an initiative such as this has never been taken into consideration, I had the time to take an idea that is in the early stages of implementation and really focus on the learning aspect, while also adopting an agile approach to project management. While agile approach in project management still focuses mainly on IT projects, there has been some changes within practice to adopt it more often within organizations. Agile project management focuses on being highly iterative and incremental process, in which stakeholders and developers collaborate, determine requirements, and focus on prioritizing their work (Bergmann & Karwowski, 2019). Another strength of my position is the fact that I am employed at the College of Business, as the college has served as an innovative leader when discussing enrollment and retention initiatives within the least ten years. The college has also seen the lowest decrease in enrollment, while other areas on campus have been impacted more. Considering that there is a track record of positive results within the college, it is expected that ideas generated at the college level tend to be tested there, and then implemented at the university level.

1.3 Research Question and Objectives

Grewal & Roggeveen (2020) define customer journey management (CJM) as an important concept within any organization that allows them to understand and manage customer experiences throughout their shopping journey. Through the identification of a customer journey a company is able to optimize both the placement of their products and services and their communication methods, allowing us to target customers more effectively (Grewal & Roggeveen, 2020). A typical customer journey is an important aspect to consider when identifying research questions and objectives. Table 1 identifies a typical customer journey for the University of Akron, beginning with the awareness stage, continuing on to a prospect, consideration, purchase and loyalty stages. The activities within each of the steps may slightly vary depending on the whether the student is searching for an undergraduate or graduate programs, but typically there is not much variation.

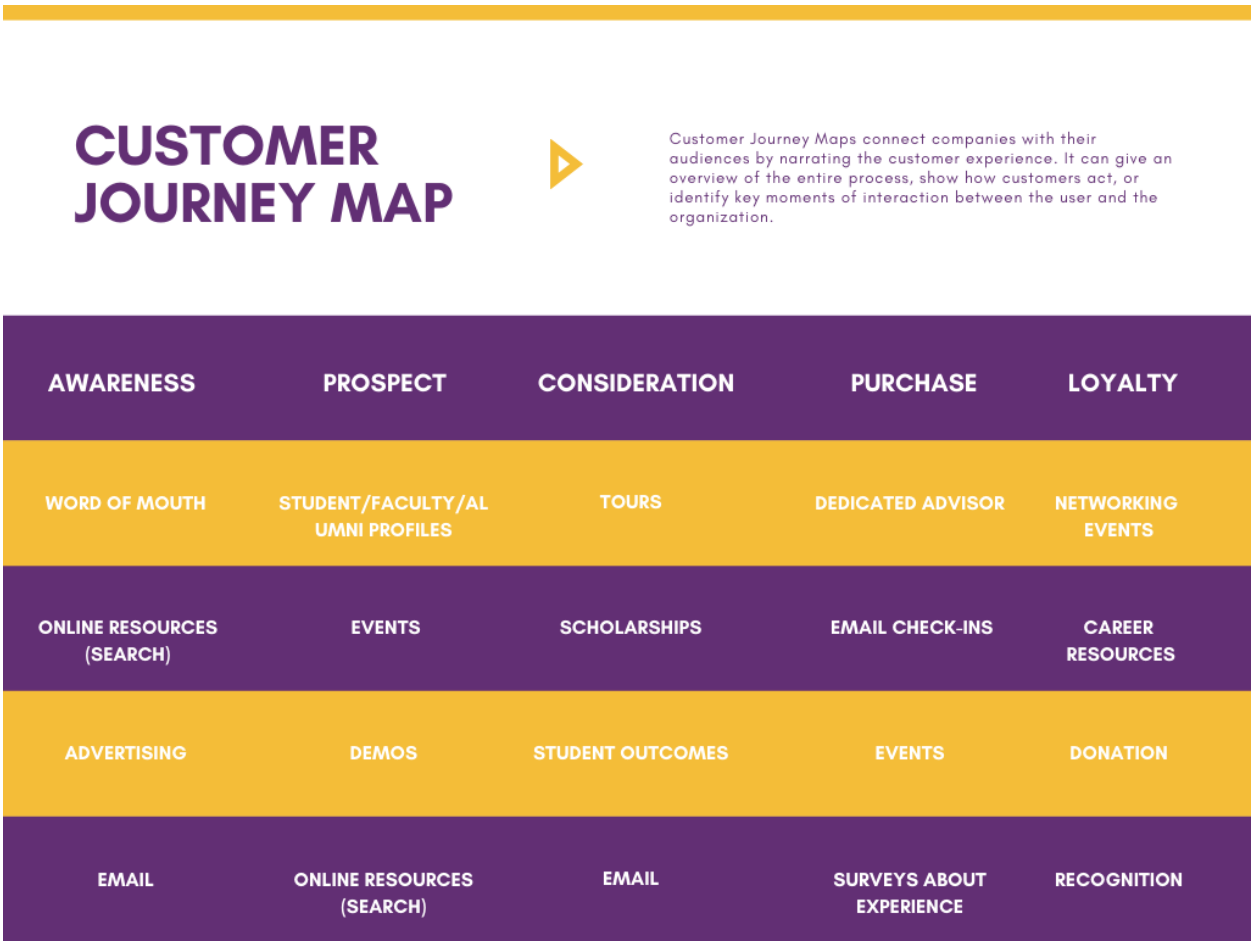

Table 1: Customer Journey at The University of Akron
Source: author

Beginning with an awareness stage, a typical student is still in high school thinking about colleges and their future. The student probably has long discussions with his/her parents and guidance counselors or other friends and family members. Throughout this stage, a student will have guest speakers from various colleges visit their school, some of these visits will spark some interest to search online and find out more information about a particular program/campus activity. Although a prospect stage is still relatively part of an awareness journey, I found this stage to differ quite a lot, hence why it is in a separate stage of the process. A typical graduate student has similar experiences within this stage, except he/she tends to be already in a job thinking about further developing their skills, upskilling for a promotion or simply looking to change the direction of their career.

As a prospect, a student will rely a lot more on online searches and websites to find out information, such as seeing a demo of a typical product or services students at this University create/innovate or get involved in, student, faculty and alumni profiles or simply familiarize themselves with events associated with campus life. This stage can also include various testimonials by current and former students. The most important aspect of the awareness and prospect stage is that it needs to provide benefits and values of the programs/activities/events/scholarships that happen at this particular university. The emphasis should be more on the awareness of everything the university has to offer that would benefit a typical student, and making sure that when a student enquires about a particular program/event/activity, we are at the top of mind and search results.

As we move into the consideration stage, a student has decided that a particular undergraduate degree is right for them, they then tend to focus search on only universities, start their application process, and connect with the admissions office or program faculty. In this stage, it's important to optimize your communications methods for one-on-one conversation through various channels, such as social media, phone, live chat, and meetings. The majority of the decisions about which university to attend tends to be based on scholarship/funding offered, so the ability to be transparent is extremely important at this stage. Some other ways to further entice applicants in this stage are through offering invitations to attend classes, arranging job shadowing within their field and providing further proof on student outcomes.

The next two stages focus on retention and loyalty parts of customer journey, which tend to be extremely important in the overall process of recruiting more people. Once a student has chosen to enroll in classes and is working towards his/her degree, it is important to focus on retention through the following: dedicated advisors, check-ins through email, surveys about experiences and offering outside of the class events that improve students' career outcomes, mental health, and overall wellbeing. After a student has gone through the program, a university has a way to continue to engage with them by offering professional development classes, networking events and opportunities to attend donation events such as rewards/recognition.

Based on the above motivation, the research question for this thesis can be stated as follows:

How can the use of Google Trends Analysis benefit university recruitment efforts?

Captured in just a single sentence, this research question could be interpreted in many ways. Hence, it is necessary to be more specific about the goals to be reached when trying to answer this research question. One aspect that is of essence is the identification of keywords used for any analysis associated with Google Trends. Research done by Choi & Varian (2012), Schmidt & Vosen (2009), suggests use of Google Trends for predicting sales and consumer behavior, however, one aspect that is missing is the methodology towards identifying relevant keywords for Google Trends analysis. Therefore, explicit work on identification of keywords through the use of action research is necessary within the overall research design.

Another research goal in this research design is identification and structuring of clusters of potential students. A set of clusters is needed as a common frame of reference applicable to and understandable for both managerial world and for potential recruiting efforts. As the goal is to have as few clusters as possible, so that every group is unique, the identification of clusters and the number of clusters will be of crucial importance for this research. Clustering is the process of using technology and algorithms to analyze data and create segments based on that analysis (Min et al., 2018). Amongst the various clustering techniques, one of the most common ones which can handle large datasets is k-means clustering technique, which is a centroid-based algorithm that tries to separate the data in groups, and each cluster is distinct from each other cluster (Kumar & Reddy, 2017).

Following up on the identification of terminology and clusters work stated above, the third goal is devoted to change management within the organization. This goal will clearly allow for implementation of ideas and better understanding of ways in which these ideas can improve the overall recruitment process. Without the appropriate execution of goals and ideas, any value derived from this research will remain just that. Change management is extremely important for my research to be implemented effectively, however there are many barriers to develop and use Google Trends as part of a forecasting model across various departments in my organization. Organizational change requires a shift from a familiar situation to an unfamiliar one, and

depending on the situation, can have a varying impact on the organization, its people and processes.

1.4 Nature of the study

The nature of this study focuses on an action research strategy while utilizing quantitative and qualitative data collection methods. Action research is a systematic approach to investigating evidence, with a focus on producing practical and relevant results that can contribute to theory (Stringer & Aragon, 2020). It differs from other research methods by placing less emphasis on the overall findings, but prioritizing and focusing on the relevance of the results and having participants act as collaborators (Stringer & Aragon, 2020). Traditional research is primarily focused on drawing conclusions and advancing knowledge; however, action research is focused on making decisions (Coghlan, 2019). The key to successful action research is iterative reflection and adjustment that is made based on the ongoing analysis of data that was collected (Stringer & Aragon, 2020).

Using both qualitative and quantitative methods in action research can provide a more comprehensive understanding of the issue. With the use of quantitative data collection, numerical data offers a more structured and generalizable perspective of the issues (Coghlan, 2019). However, the action research process is an extremely iterative process that benefits from qualitative data, such as observations, and journals, as it can capture the rich and complex context, providing insights into the experiences, challenges, and social dynamics involved (Coghlan, 2019).

1.5 Definition of terms

The following terms were used operationally in this study.

> **Google Search Query** – As defined by Choi & Varian (2012), a set of words or phrases a users enters into the Google search bar to find information online.
>
> **Non-branded keywords –** Defined by Jansen et al. (2011) as search terms that do not include specific brand names, the focus is on generic and industry-specific terms. Often used in online marketing.

Branded keywords – According to Jansen et al. (2011) branded keywords are terms that include a particular brand's name, product or service. Often used in online marketing.

Click-through rate (CTR) – An important metric in online marketing used to measure the percentage of people who click on an ad or link compared to the total number of people who saw it (Richardson et al., 2007)

Conversion rate – McDowell et al. (2016) define conversion rate as the percentage of visitors who take a desired action, such as online making a purchase, filling out a form or downloading a whitepaper.

A/B testing – Siroker & Koomen (2015) define A/B testing as one of the most impactful methods when comparing two version of a website or campaign to determine which performs better.

User-Generated Content – Content that is created by users, often shared on social media or other online platforms (Müller, J., & Christandl, F., 2019).

Search Engine Optimization (SEO) – Sharma et al. (2019) defines search engine optimization as the process of optimizing a website to improve its visibility when users search for content related to your company, in hopes of driving organic (non-paid traffic.

Google Adwords (Google Ads) – Tricahyadinata et al. (2017) defines Google AdWords as an online advertising platform developed by google enabling businesses to display ads on Google's search engine results page.

Funnel – Venermo et al. (2020) discusses funnel as being stages that the potential customer goes through, from awareness to conversion, creating a specific customer journey.

1.6 Structure of the thesis

Chapter one was an introductory phase to my research and focused on introducing my thesis and presenting the background related to the management problem. The first aspect of this chapter provided specific rationale for the use my research. I also discussed some of the objectives and goals as they relate to my workplace problem. I presented my overall research problem with an understanding that throughout the writing my research problem will be redefined. In this chapter, I also identified my role within the research and the impact I have within my organization to take on an initiative such as this.

Chapter two presents an overview of literature on several different topics related to higher education, management, and digital marketing. The chapter started out with providing an overview of the current state of higher education from an academic standpoint. Further on, the focus shifted on management literature, focusing on change management. The literature surrounding search data focused on better identifying the trends within digital marketing that could impact my study. The last two areas that were reviewed are forecasting and segmentation. After my action learning cycles, I revisited the literature reviewed and added two additional sections on self-reported surveys and online focus groups, to better support my ideas for future research goals.

Chapter three focuses on providing the research methodology, where my goal is to provide an understanding to the reader of the overall research analysis process that my research will follow. My focus in this chapter was rationalizing the situation ontological position constructivism and epistemological position positivism and relies on statistical methods to determine significant results. The methodology was designed to focus on addressing the management problem of utilizing search query data to improve customer acquisition. Discussion surrounding ethical issues and limitations was also discussed.

Chapter four focused on identifying the action learning set (ALS) cycles, and the process that took place throughout those cycles. There was a clear understanding of the learning that took within these cycles, and how one inspired the findings of another one. This chapter provided insights into the data analyzed, presenting findings, and learning that occurred throughout that process. Throughout this chapter, there is some identification of self-reflection and sensemaking, with recommendations clearly identified.

Chapter five was the chapter that provided an opportunity for presenting limitations of the current data and findings, while clearly identifying the recommendations for data collection of future research studies surrounding this topic. This chapter also presented the research implications and self-reflection that occurred throughout the process of writing this thesis.

1.7 Chapter Summary

Chapter one was instrumental in providing an overview to my research and outlining the overall management problem. I also summarized the overall impact COVID-19 had had on the direction of my research approach. Furthermore, I provided an overall summary of research done within digital marketing domain, and the gaps that exist, which can serve as an area of opportunity for my research. My role as an active researcher was clearly identified as an individual that has influence on this topic, but also expectations from others within the organization. Further on, my credentials within this domain make me an excellent researcher for this topic. Overall, my approach to this thesis was based on an action research approach, with the utilization of action learning sets from others within my organization. However, creating critical literature review was one of the first steps that serves as the motivator for this research. The next chapter will focus on providing insights into the literature review conducted.

2 Literature Review

2.1 Introduction

Chapter two builds on the research rationale and literature discussed in the first chapter, which helped identify the research title and the research questions. The framework behind the literature review was developed from the title and the research questions to assess and develop context surrounding the management problem. As an overview, The University of Akron has been experiencing declining undergraduate and graduate enrollment over the last couple of years. This led me to investigate my research question of *Searching for a better segment: segmentation of student body through the use of online search data to improve university enrollment.* This has been accelerated by the uncertainty of COVID-19 pandemic. The pandemic has led to many changes in consumer behavior and shifts in the way companies need to reach and communicate with their existing and prospective customers. Social media and digital marketing have opened many opportunities for new forms of marketing and new ways to reach customers across the globe. An untapped area of research regarding the use of Google Trends to understand customers and their online behavior better for improved forecasting provides me with an opportunity to utilize Google Trends within my organization to better forecast and cluster prospective students. This provides me with an opportunity to use data collected with Google Trends and understand how it can help the University of Akron in its efforts to solve decreasing enrollment problems, better forecast for the future, but also better understand the individuals who are potential customers.

2.1.1 Literature Review Search Strategy

The theoretical perspective and the overall framework for my research are mapped out strategically to ensure that the proper search strategy is intact. The literature review includes studies found using databases such as Google Scholar, Journal Storage (JSTOR), Academic Search Complete and Directory of Open Access Journals (DOAJ). The literature reviewed included a combination of academic and practitioner literature. Both practitioners and researchers show the importance of the use of search query data as it is a contemporary way to provide more in-depth information about consumer search behaviors (Bakirtas & Demirci,

2022). The concepts that were chosen in the literature review ground the management problem by relation to the research questions and considering the overall approach of the research question and objectives. I began by literature review search by searching for literature with the following keywords:

1. General management
2. Change management
3. Higher education
4. Student enrollment
5. Consumer behavior
6. Digital marketing
7. Google trends

The above concepts were used for the literature review focus and strategy to best identify and develop theoretical framework. Moreover, I continuously went back through the literature during the data collection process, data analysis and the overall write-up, to make sense of what was being collected. Literature was essential in putting context behind the data collected.

The first section of this literature review looks at the diverse points of view surrounding the current state of higher education. In particular, the focus is on evaluating trends and future predictions, with a strong focus being on the overall situation and the impact COVID-19 has had. The second part of the literature review focused on literature surrounding change management, as its relations to better understanding reasoning behind resistance to change, various theories surrounding change management and the type of an impact digital transformation has had on change within organizations. Further on, the focus shifts to search data, with literature surrounding varying points of view regarding using google trends to predict and limitations of search data being discussed. This section does also focus on reviewing literature surrounding the topic of forecasting. And finally, forecasting plays an important role within my research, hence looking at the literature which evaluates literature surrounding the importance and the role of forecasting, along with taking a step further and evaluating a time-series technique. This includes elements from economic and social theory including organizational and change management theory, which focuses on explaining behaviors of individuals and how they tend to interact with each other to perform the activities towards change management within an organization.

When reviewing the literature, I was able to include 45% of literature that was done within the last 5 years, 21% was done within the last 10 years or less, and 34% of literature focuses on literature that is older than 10 years, which was able to provide me with some traditional viewpoints which I find of importance as they are the base guidelines for my review. This was not necessarily the breakdown that I had planned for, it was an interesting outcome after my review. Initially, my literature review did not include discussion surrounding self-reported survey measurement and design and online focus groups, but throughout the writing of my thesis, I always went back to my literature review in order to reference insights, and I noticed that one of the areas which I will have to utilize in the future in order to enhance my research are self-reported surveys and online focus groups.

2.2 Current state of higher education

Prior to COVID-19, higher education faced multiple challenges in particular challenges related to higher enrollments, and staffing issues (Chan, 2018). Some other challenges for institutions related to weakened financial support for students (Ryan, 2015). State supported public institutions such as The University of Akron have also seen the support from the state has continuously decrease, creating additional challenges. COVID-19 has had a profound influence on the way teaching and learning in higher education is conducted (Bartolic et al., 2021). Across the globe, we saw a shift occur as educators were forced to transition their courses from mainly-face-to-face teaching settings to remote instruction, mostly done in an asynchronous or synchronous way (Bartolic et al., 2021). Higher education emerged from COVID-19 pandemic as an agile industry, that needed to adapt majority of its everyday practices to survive. However, this shift did not necessarily just occur internally, it also has had a major impact on the overall search process. While specific details vary from institution to institution, country to country, the overall industry across the globe faces new challenges (Bartolic et al., 2021). Although real changes have happened, infrastructure and development are continuously adapted to match the current industry needs, the real change started to occur during the pandemic, meaning that full organizational development and adaption are still very much in progress.

In contrast, some institutions were better positioned to respond to this pivot, in particular those that had previous experiences and infrastructure already in place to deliver online or hybrid courses. Still, even these institutions faced new challenges internally and externally. Pathak (2016) argued that those institutions that do not add an online component to the physical campus experience will not survive. This trend, although it had been happening for years, was accelerated at a much higher level during COVID-19. Student engagement in online learning has been one of the key topics discussed in research. For example, Dumford and Miller (2018) argue that the more online classes students take the more likely they are to engage in quantitative reasoning, however, they are less likely to engage in collaborative learning, interactions with the faculty, and discussions. However, this does depend on individuals, as many factors such as the lecturer's presence, work-life commitments, content, assessment, and workload, are all responsible for influencing the level of student engagement in an online class (Muir et al., 2019).

Numerous studies discuss innovative pedagogical and technological ways that institutions should utilize in order to improve and adapt their classroom instruction. For example, Daniel (2020) discusses the importance of incorporating asynchronous instruction and providing personalized approaches for students depending on their needs level and field of study. Bao (2020) focuses on providing strategies that can be incorporated into instruction during the pandemic. The strategies included tactics such as breaking the content into smaller modules for them to comprehend the content easier and strengthening students' critical thinking abilities, in particular improving learning outside of the classroom (Bao, 2020). The importance of delivering quality education in the environment that we are in today is mainly connected to faculty, learning resources, and technology (Benito and Diez, 2020). Authors tend to make academic recommendations, from course delivery recommendations to curriculum alignment to faculty training for the online learning environment (Toquero, 2020).

Furthermore, authors tend to focus a lot of discussion on the overall health and safety within the academic environment. Toquero (2020) discusses the importance of strengthening the overall environmental policies, improving the tactics surrounding hygiene practices, and finally focusing resources on improving online mental health services for students. Sahu (2020) also focuses on a discussion of the health and safety of students, with a strict focus on recommendations

surrounding improvement of counseling services for students that support mental health and the overall well-being of students. The rapid evolution, accompanied by personal challenges that are brought on by COVID-19, have influenced students of all age groups (Hasan and Bao, 2020). COVID-19 has had a larger negative impact on those students from less privileged backgrounds (Aucejo et al., 2020). This is particularly important for the University of Akron, as it is an urban institution with a large population of students being those that are first-generation students. Many students have experienced reduction in family income and limited access to proper technological resources. Furthermore, Lee (2020) argues that 1.5 billion students across the globe are deprived of basic educational opportunities. This leads to potential psychological impacts on students' health.

Hence, a lot of discussion surrounding current state of higher education was focused on understanding the changes that need to be addressed regarding delivery method, faculty training and students' well-being, leaving a gap within better understanding and changing the overall recruitment approach utilizing digital technologies. Moreover, changes discussed above that are occurring within higher education tend to be easily accepted and lots of effort was put in from the top management to provide opportunities. However, in the spirit of ensuring that the enrollment increases, proper measures do not appear to be adapted and automatically implemented within an institution. Therefore, a further discussion surrounding change management initiatives is clearly an important aspect to consider in my thesis, as it will improve the chances of my recommendations being adopted. Furthermore, discussion surrounding change management and the role of action research is included in the next section.

2.3 Change Management

This section reviews the literature regarding various theories of change management, in particular, focusing on how to manage change by applying marketing and other business techniques to sell change to the change recipients. There are many barriers to develop and use Google Trends as part of a forecasting model across various departments in my organization. As the stakeholders of change are very diverse (top administration, faculty, staff, and current students) reluctance to change exists amongst the stakeholders, controversy of the importance of

online data in a traditional university environment exists and there is a lack of skillset needed to collect and analyze the data across the University of Akron. Therefore, development and integration of Google Trends as part of forecasting could trigger some organizational change, which will need to be managed by a change agent. A change agent is an individual or a group that takes on a task of initiating and managing change within an organization (Tschirky, 2011). Further, I will review literature regarding change management and implementation to assess ways in which change can be better managed within my organization. Particularly, the topics and limitations surrounding change management can be used to help me better implement strategies surrounding the use of Google Trends to help improve The University of Akron enrollment.

2.3.1 Organizational change

Organizational change is a topic that has been widely discussed in the extant literature. Often defined as the process of constantly renewing an organization's direction, structure, and capabilities to serve the changing needs of both the external and internal audiences (Moran & Brightman, 2001). It is important to note that change can happen to serve or have an impact on the internal stakeholders, such as employees, and/or external stakeholders such as customers. Organizational change requires a shift from a familiar situation to an unfamiliar one, and depending on the situation, can have a varying impact on the organization, its people, and processes. Across literature many different reasons exist as to why change must happen, it can vary from competitive demands to perform at a higher quality and more efficiently while keeping the costs lower to simply there being a need to adapt to an ever-so changing environment where technology, culture and economics are impacting the way in which a business should be run (Cummings, 2004). Through change management, the goal is to create an organization which is performing at higher quality (Guimaraes & Armstrong, 1998).

Being that change is one of the most consistent and permanent things in life, it is widely practiced across many aspects of life. Within an organization, change comes in two primary dimensions: changes in culture and changes in structure (Kennerfalk & Klefsjo, 1995). Some literature suggests that it is often heavily resisted due to many different reasons that will be discussed within this literature review. As the world we live in evolves, so do generations and organizations. It is extremely important for organizations to continuously change to be successful

and relevant. It is often noted that crisis leads us to change management. Improving business practices and individuals associated with the business by implementing diverse changes across the organization is one of the keyways an organization can succeed, whether this change is related to a crisis or not (Sankaran & Ranjan, 2010). Some scholars go as far to say that an organization which fails to make changes will be removed from the competition (McDonald, 2000). This takes us a step further and says that organizational change is not just about making an organization more competitive, it is about making an organization sustainable.

Throughout the literature reviewed, there is not one consistent definition of change management. However, some of the same values hold true amongst the researchers, it is an important concept within an organization and quite difficult to manage across any of the industries. According to Pierce & Delbecq (1977), change management is often defined as the ability to adopt a new idea, procedure, process, or behavior within an organization. Further on various literature discusses change management as a process that does not happen overnight. Berger (1994) points out that change management is the continuous process of aligning an organization to the changing environment and the ability to do so in a more effective and responsive manner than the competitors. Thus, the true value from change management comes through experimentation. As a continuous process of experimenting and adopting to the external factors, by matching the organization's core competencies to the changing environment, an organization can continuously experiment various scenarios before implementing change, focusing on choosing the most effective scenario (Burnes, 2000).

Through action research, organization's change management practices can be improved. Rowell et al. (2015) defines action research as a way in which we acquire knowledge to solve a problem, in particular reflecting on consequences of our own beliefs, assumptions, and bias, with the primary goal of understanding, developing and further improving social practices. Action research acts as a proactive step in assuring long-term success within an organization, as it is not an overnight process or goal for the organization (Pedler, 2008). Through utilization of action research, organizations can improve learning, collaboration and leadership (Pedler, 2008). This provides organizations with a competitive advantage to move forward and continuously adapt change tactics. In particular, organizations that adapt to action research are also better able to

adapt to change and crises they are faced with in a more efficient manner, as the process of action research requires the stakeholders involved to utilize critical thinking, collaboration, reflection, theory and to truly understand the learning behind the process (Sankran & Ranjan, 2010).

2.3.2 Resistance to change

Change is an important concept within an organization in order to create an entity that is sustainable within an environment. Some literature suggests that resistance to change is a common aspect which tends to cause change processes to fail, hindering the implementation and increasing costs (Burnes, 2015). In many instances, personal perceptions of change are associated with the overall resistance to change an individual has (Oreg, 2006). Hence, communicating properly, and clearly setting the goals is essential in change management. Singh et al. (2012) argues that not only is the communication important, but also in the absence of clear communication, people will make inaccurate and dangerous assumptions. Burnes (2015) argues that in order to better manage resistance to change and achieve desired goals, the key is to not attempt to impose change, but to encourage participative decision-making.

A common assumption across literature is that attitudes towards change are consistent over time, however Rafferty and Jimmieson (2016) argue that people's attitudes and beliefs towards change evolve over time, and, they focus at looking into resistance to change attitudes at two points in time – early on and later in a change process. While more traditional literature considers resistance to change in relatively negative terms, some of the modern literature looks at resistance to change in more of a positive objective (Giangreco, 2002). More recent literature also suggests that individuals first evaluate the negative consequences for themselves, assuming that resistance to change is not a natural habit to individuals but is supported by some types of consequences and/or behaviours the change has an impact on (Abdel-Ghany, 2014). As argued by Singh et al. (2012), there are certain factors that influence resistance to change: awareness, understanding and concerns in relation to performance and effect.

When an organization is unable to look into the future with clarity, its strategic efforts suffer, and many barriers exist (Barr et al., 1992). Other times it depends on the way in which aspects of change are communicated, as information assumptions and misinterpretations can lead to resistance (Hutt et al., 1995). Costs also play a major role, as any increase in direct costs of change could lead to barriers (Rumelt, 1995). Another aspect that impacts organizational change is cannibalization in business, which is defined as a loss in sales caused by a company's introduction of a new product by achieving revenue for the new product (Albuquerque and Bronnenberg, 2009). Hence, any cannibalization costs, which might help one product but hurt another can hinder change implementation (Rumelt, 1995). As costs play an important role within change implementation, it is significantly important to understand every aspect that the change will impact, and all of the data behind that impact. The more concise the communication, the less assumptions will be made regarding direct and indirect costs of change implementation.

Top management's involvement is essentially one of the most important aspects of a successful change implementation, as strategic vision and commitment need to support the new initiatives. Hence, the lack of vision and poor strategic commitment are barriers of change implementation (Rumelt, 1995). Further on, organizations that tend to be more traditional with deeply rooted values, history and emotional loyalty are also those that suffer from resistance to change implementation (Nemeth, 1997). This type of resistance can also be seen within only certain departments or amongst certain individuals, as departmental politics from those departments that are mostly impacted from change can be a barrier (Rumelt, 1995). In many instances change requires capabilities and resources to be implemented, but any lack of those or perception of inability to obtain those capabilities and/or resources is a barrier to change implementation (Rumelt, 1995). A widely held assumption amongst literature is that a formal, and structured change implementation process led by top management is required for a successful achievement of goals.

2.3.3 Use of Analytics in Change Management

One of the unique concepts that has recently been explored in literature is the use of data-driven methods in order to improve the process of change management. Various literature looks at ways

in which decisions supported by analytics and data can be utilized in order to make change management a more effective process. A concept that has been very popular in business but has also received a lot of attention in change management is big data (Gandomi and Haider, 2015). Recent advances in technology and data analytics, from the affordability of computational power to increase in data availability and storage, have all paved a way for a more data driven management across the organization (Kiron, 2017). In particular, intelligent data, analytics and algorithms could be opportunities which provide organizations with a way in which they could manage organizational change better (Ewenstein, Smith, and Solongar, 2015). However, one of the key barriers is that many organizations do not possess access to big data, or simply are not aware of the capabilities of the data they might have access to.

Recent literature suggests that only some changes that have been planned succeed. In fact, within my organization, for the changes that I have had exposure to, only one of three planned changes actually succeed. Hence, why it's increasingly important to use data-driven methods in order to predict the results before implementing. For example, retailers are in an extremely competitive environment, with increasing challenges, such as many products, multi-channel distribution, online selling and changing customer expectations. In many situations, these companies have already become as lean as they could, yet in order to further compete they have to think of more innovative analytical models, such as advanced price optimization (Simchi-Levi and Wu, 2018). Implementing any type of new technology or big data analytics within an organization has to be accompanied with appropriate change management steps, where day-to-day steps of management process are taken. Simchi-Levi and Wu (2018) identify the need for external data sources that can complement internal data for the success of any big data initiative within the organization. As important is the need to have quality data on hand, and avoid silos in order to create a more collaborative culture of data sharing. Finally, it is extremely important that proper communication is included in every step so that every employee truly understands that the data and analytical approaches are there to complement and make their jobs easier as well, and not are not there to replace them (Simchi-Levi and Wu, 2018). In order to better assess analytics and change management within an organization, it is important to understand the models associated with analyzing data and managing change in an organization. The next section will start with the discussion of the ADKAR model.

2.3.4 ADKAR Model

Amongst change management models, a model referred to as Awareness, Desire, Knowledge, Ability and Reinforcement (ADKAR) is widely used to prevent resistance to change (Shepherd et al., 2014). The model was developed by Prosci Inc. in order to provide a very specific goal-oriented framework (Shepherd et al., 2014). Being that ADKAR a five-step management model, which has to be followed in the exact order in order to provide organizations with a framework for change initiatives, the strong emphasis is on the people side of change (Shepherd et al., 2014). This is important because majority of change initiatives tend to fail because of the people involved (Hiatt, 2006). Hiatt (2006) claims that the ADKAR model provides a primary framework that is responsible for bringing new and traditional frameworks to manage change and is responsible for understanding why change initiatives fail. In a sense, this model provides framework and direction to individuals handling change initiatives to better manage the overall change process and the resistance to change, empowering organizations to remain competitive.

Awareness	Being aware of the need and the requirement for change.
Desire	The ability to have the desire to bring about the change and be a participant in it.
Knowledge	Knowledge regarding bringing about this change.
Ability	The ability to integrate change on a regular basis.
Reinforcement	The ability to not only implement change, but also reinforce it later on as well, making it a concept that sticks around and becomes part of the culture

Table 2: ADKAR Model
Source: Hiatt (2006)

ADKAR model, which allows an organization to go through change as a process rather than an event, follows a transformational leadership theory. Transformational leadership theory has emerged as one of the most prominent leadership theories (Mhatre & Riggio, 2014). Through

this type of a leadership theory, leaders encourage, inspire and motivate employees to innovate and implement change that will help the organization succeed (Mhatre & Riggio, 2014). Higgins (2015) argues that transformational leaders create a supportive environment and an organizational culture of innovative change environment. Hence, transformational leaders tend to improve the quality of product/service offerings.

One of the key advantages of ADKAR model is the perspective on change that allows change management tactics to have focus and direction (Hiatt, 2006). It is highly goals driven with measurable outcomes, yet simple enough to be utilized without much former training. As majority of change initiatives fail due to the people involved, the model has a strong emphasis on the individual level, focusing on showing how organizations can increase the likelihood of successfully implementing change. Hiatt (2006) uses the model to assess individual readiness for change, hence really showing one of the key advantages of the model, which is to allow individuals and organizations to assess the right time to initiate change management tactics. But more importantly to assess and identify the barriers and areas of why change is not working, allowing individuals and organizations to take necessary action to make sure the change is successful once implemented. As people tend to be at the core of change management's success, various research suggests that there are certain theories that can help improve people throughout the process, with one of them being nudge theory, which I will discuss in the following section.

2.3.5 Nudge Theory

While some literature suggests resistance to change as one of the core reasons behind failure of change management initiatives, others suggest people are not necessarily naturally resistant to change. Nudge theory in change management is a way in which a change initiator leads people into the desired decision (Arno & Thomas, 2016). Through nudge theory, change management becomes easier as people are nudged along the way in small incremental steps towards the change, hence the change recipients tend to adapt to change more quickly and on their own will. Arno & Thomas (2016) discuss nudge theory in change management as a way in which change initiators improve the directions of people's choices while still allowing them to maintain freedom of choice. This way there is still a way in which a change initiator controls the change,

however without many restrictions and negative consequences (Arno & Thomas, 2016). An underlying assumption of nudge theory is that people tend to do things that are not always in their best interest or delay doing things that might be in their best interest.

One of the key benefits of "nudge" theory is that it can help us break daily habits and make a variety of choices that are in the best interest (Sunstein, 2015). Thaler & Sunstein (2008) developed nudge theory as a behavioral science concept that suggests indirect techniques and positive reinforcement can influence people's behavior more effectively. The key is to implement shifts within the environment that encourages people to make decisions that are in their self-interest, gives them the freedom to choose and also allows them to be in control (Thaler & Sunstein, 2008). Therefore, nudge theory helps people realize the importance of a challenge and/or change and encourages them to be independent in their choices of a solution. It is highly effective as it allows people to engage in critical thinking, all while being in control of the choices they make.

However, there are those who oppose nudge theory and consider it as something that is not useful in change management. Mols et al. (2015) argue that nudge theory in change management is a short-term solution which does not necessarily lead to long-term success in behaviour change. Other research points towards some ethical issues associated with nudge theory. Research done by Tannenbaum et al. (2017) finds "partisan nudge bias" in various cases they tested, suggesting that if people hear of a change or action that is supported by their own social group, they are more likely to support it. This bias leads some to believe that through the use of a nudge theory in change management, the actions are manipulative and they threaten one's own critical thinking and undermines their own personal opinions and freedom (Tannenbaum et al., 2017).

2.3.6 Kotter's Change Management Theory

Although many change management theories exist, one that has been used a lot regarding the adoption of technological changes and innovations has been Kotter's Change Management Theory (Campbell, 2008). Kotter (1996) proposed an eight-step model (Table 1) which should be

used in order to create an effective change. An underlying assumption behind Kotter's theory is that in order for change management to be implemented successfully, steps presented by Kotter need to be followed in a linear fashion without skipping any of the steps. In fact, some literature argues that the only reason why some change management initiatives that utilize Kotter's Change Management Theory fail is because they do not follow the step by step process outlined by Kotter (Jones et al. 2019).

Table 1 represents the eight stages associated with the Kotter's Change Management Theory model, which also fall into one of the three phases demonstrated in the table (Kotter, 1996). The eight phases of this model are creating a sense of urgency, creating a strong team of collaborators, creating a vision, communicating the vision, empowering others to get involved and act on the vision, planning for the short-term successes and wins, being persistent and continuously producing change, making change permanent (Kotter, 1996). The eight stages if followed correctly end up evaluating the three main phases with this model: creating a climate for change, engaging and enabling the organization, implementing and sustaining the change (Kotter, 2008).

*The 8-Step Process for Leading Change – Dr. John Kotter

Figure 6: The 8-step process of leading change
Source: Kotter (2008)

Kotter (2008) argues that the eight steps need to be followed strictly without any skipping, hence one of the disadvantages of the model is that it is a fairly rigid model, with no room for creativity and innovation. It is also a time-consuming model as there are many steps that require a lot of attention to detail. One thing that we have learned during the COVID-19 pandemic is that sometimes change needs to happen fairly quickly, and being agile is one of the key initiatives organizations should work towards. Being agile requires trying different approaches, leveraging what woks, iterating and adjusting as necessary (Mancl et al., 2020). While some of the steps of Kotter's Change Management Theory are pretty self-explanatory, others can be interpreted in many different ways, hence it really depends on the interpretation and implementation of those involved with change initiatives.

Another theory that is more innovative in nature is Rogers' Innovation Diffusion Theory. Rogers (1983) defined innovation as an idea, practice or object that seems to be perceived as new, while diffusion is the process by which innovation is communicated. Rogers (1962) identified six main stages in the process: problem definition, research, development, commercialization, adoption and diffusion and consequences. But most importantly, in order for the adoption of an innovation process to be successful, there are five classifications of individuals: innovators, early adopters, early majority, late majority and laggards (Rogers, 2003). Innovators represent the smallest percentage of population, but they are those individuals that are willing to try new things and are open to change (Rogers, 2003). Early adopters are those that take an initiative ahead of everyone else to adopt a new technology or innovation, they are trend setters and they are the ones who others observe in order to assess whether or not they will adopt a new innovation (Rogers, 2003). Early majority tend to be the highest percentage of population. Early majority are those individuals that adopt new ideas just before everyone else, they are the ones that avoid risk, do not like complexity and tend to adopt the proven solutions (Rogers, 2003). Late majority are the ones that respond to peer pressure, they are usually technologically shy, and tend to adopt new ideas only to keep up with the competitors or to follow proven trends within the industry

(Rogers, 2003). Finally, laggards tend to be the last to adopt an innovation, they are usually suspicious of innovations, including innovators and change agents (Rogers, 2003).

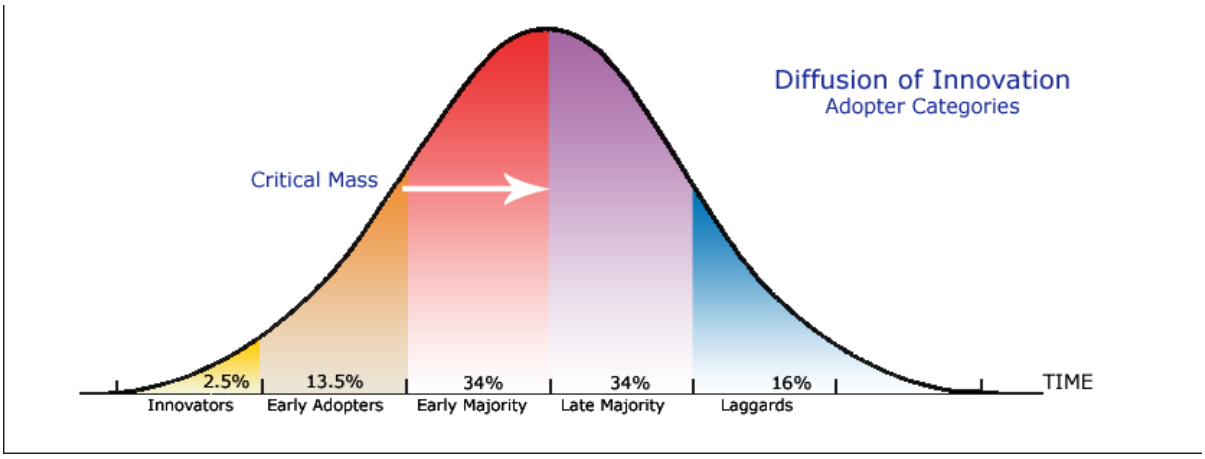

Figure 7: Diffusion of Innovation Adopter Categories
Source: Rogers (2003)

As Rogers' theory is fairly broad in scope, it tends to lend itself to being a fairly flexible process during the change management of innovation adoption (Straub, 2009). It allows for innovation and creativity to be included within the process. At the core of Rogers' theory is the ability to clearly identify the innovation, clearly identify communication channels and those involved as stakeholders, in particular their role as change agents. Rogers' theory provides individuals with many advantages, however there are some disadvantages associated with the concepts of the theory. As Rogers' theory is so focused on innovation and the process of creativity, it does not take into consideration the complexities within the environment from a cultural, societal and economic environment (Straub, 2009).

2.3.7 Digital Transformation

Digital transformation is an increasingly important topic within change management literature. Andriole (2017) argues that as a strategic initiative within the organization, digital transformation has been affecting and challenging management across various industries and contexts within the last decade more so than ever before. The topic of digital transformation has

in particular skyrocketed during the challenges surrounding COVID-19 pandemic, which we are still dealing with considering the increasing exposure to new variants. When looking to define digital transformation, there is not one consistent definition across literature. Although there is no standard definition of digital transformation across researchers, there are some common themes that they all follow. The most common theme amongst literature is that due to an increase in digital technologies, organizations are both effected and need to find a way to be agile in order to adapt (Hanelt et al., 2020).

McKinsey Global Survey reports that an increase in digitization has been happening for companies for a number of years now, however COVID-19 accelerated a trend that has been slowly happening over a number of years (LaBerge et al., 2020). The most important thing that the report highlights that the transformation is not only from a technological aspect, but a much broader and deeper change happening within organizations and from a consumer standpoint, with technology only being a small part (LaBerge et al., 2020). Not only are organizations transforming the way they operate, they are transforming the products they offer, ways in which they offer them, their business models and the way in which they manage changes in consumer behavior. Hence, the adoption of digital technology is very disruptive and innovative in nature.

With challenges come opportunities, and digital transformation offers organizations an opportunity to advance knowledge regarding the organizational change (Hanelt et al., 2020). Digital transformation differs from information technology as it includes big data analytics, social media, cloud computing and mobile technologies (Hanelt et al., 2020). Digital transformation is also very different from information technology as it is widely led by consumers, and their adoption leads to changes and opportunities in organizations. Post et al. (2020) discusses the importance of review articles for advancing theory development. Since digital transformation is a topic that has expanded and has had so much development during the COVID-19 pandemic. Thinking about digital transformation differently and allowing for research to develop interesting empirical studies will be the key in the years to come (Post et al., 2020).

2.4 Search data

The available literature for the use of search query for segmenting customers is still evolving, with much of it existing as anecdotal reports from researchers. This thesis compiles recommendations and insights from these studies and also draws upon an inspection by the author of selecting search queries in the most effective manner for the University of Akron. As the literature on the online setting of search query data is still evolving, the title of "selecting the right segment" may be prematurely ambitious; hence, an alternative title might be that selecting the right segment is currently a work in progress, and it is the overall process that matters. Nonetheless, the extant literature and examples of the use in business settings contain important lessons that merit repeating. In addition to critical lessons, more subjective recommendations are also offered based upon tentative observations. It is expected that the reader will be able to differential between the critical lessons and the subjective recommendations, and hence, apply subjective recommendations according to discretion.

It is no surprise that attracting new customers is one of the primary goals for most of the companies, this includes non-profit organizations such as the University of Akron as well. With an oversaturated market, and an increase in activities within a digital environment, the task of attracting new customers requires new tactics and approaches. Naturally, consumers are always looking for ways in which they can minimize any uncertainty, psychological or financial, when purchasing items (Jun, S.-P. et al., 2018). Traditionally, consumers would seek information from their friends and family, but now they tend to use the internet, in particular their smartphones, to search for information. A consumer's online search tends to lead to a consumer purchasing a product online (Shim et al., 2001). In particular, it is important to note that as consumers associate higher level of risk with the product/service or higher involvement of higher price, they tend to search for information from others more often (Beatty and Smith, 1987). Hence, the statistics behind search activities are a great resource for monitoring, analysing and predicting consumer behaviour towards a certain product/service (Jun, S.-P. et al., 2018).

2.4.1 Using Google Trends to predict

With continuous growth and improvements on the Internet, searching for information has

become very effective and efficient (Kulkarni et al., 2012). Search engine use is a major activity that people utilize when using the internet, and that data is readily available to be analyzed and utilized for (Kulkarni et al., 2012). In general, this data is collected and used for search engine advertising purposes (Kulkarni et al., 2012). As a method to improve prediction methods, there are several sources of data that provide real-time economic activity available from companies such as Google (Choi & Varian, 2012). Since the beginning of January 2004, Google has started collecting data on the number of searches for particular keywords and/or key phrases individuals use when surfing the web. Google is able to provide a daily history of the number of searches for a particular search term and can restrict the results to a particular geographic region. I have decided to review this literature as the demand in the higher education industry is heavily driven by word of mouth (Briggs & Wilson 2007); with online information search and eWom (electronic word of mouth) being just as important (Galan et al. 2015).

Google is the leader within the search engine market and when searching for information, the term "to Google" has entered into our everyday lives, in a way that none of the competitors' has (Arora et al., 2019). Harford (2017) argues that 90% of internet searches are handled by Google, and businesses tend to rely on being ranked highly on the platform when various searches are made to attract the attention from potential customers. Google keeps track of statistics for the search queries made by people and makes these insights publicly available on their Google Trends page.

It is difficult to estimate the number of Google searches per year due to commercial confidentiality, but it is estimated that in 2018 the number of searches rose to 2 trillion (Arora et al., 2019). If we take into consideration the pandemic and the increase in internet usage during the pandemic, we can safely conclude that the number of Google searches has drastically increased over the last 3 years. Every search that occurs and every page that is viewed is tracked and used by giants such as Amazon and Google to further tailor advertisements and the results of searches to each person's browsing history (Arora et al., 2019). Individuals tend to search for many things online, such as consumer goods and services, practical information (such as directions, contact information and hours of operation), and questions about their health and every other aspect of their lives.

One of the first uses of Google Trends to predict consumer behaviour was used by Ginsberg et al. (2009) to show Google can be used to detect influenza outbreaks in the United States. Following this study, several other researchers have investigated the use of Google searches in various fields such as health, marketing, economics and finance. Choi & Varian (2012) used Google search data in order to forecast unemployment, in particular focusing on whether or not searches can predict initial claims for unemployment benefits. Other researchers, such as Schmidt & Vosen (2009) used Google searches to predict consumption, in particular a measurement of consumers' preparatory steps to spend. Following some of these initial studies, there have been numerous other studies that have explored the use of Google searches on diverse topics across almost every industry.

Hand and Judge (2012) investigate Google Trends data in relation to a forecast of cinema admissions and conclude that Google Trends data can improve accuracy of cinema admission forecasting model. I chose this article as part of my literature review, as cinema admissions is related to customer acquisition within its respective industry in a similar way in which enrolment is part of customer acquisition for higher education. Through this article, I was introduced to some of the other literature surrounding Google Trends, but it also provided me with a methodology which was taken in order to come up with clear estimates and forecasting models. Further on this article introduced me to work done by Choi and Varian (2012) who use Google Trends in order to improve their automobile sales forecasting model.

Choi & Varian (2012) argue for the use of macroeconomic statistics, in particular they discuss if one augments an autoregressive model of the sales of motor vehicles in the US with series that reflects the overall evolution of the search intensity for the key terms Trucks and SUV's and auto insurance, the overall forecast accuracy improves by 10 percent. Further meaning that if time series, reflecting the overall search intensity of terms related to the macroeconomic statistics are to be included in the regression which is used to forecast, the results are anticipated to improve (Choi & Varian, 2012). In particular work by Choi & Varian leads as a guide in which Google Search trends data can be utilized to improve various indicators such as unemployment claims, automobile sales, travel destination planning and consumer confidence.

Further on Beall et al. (2016) provide a longitudinal analyses of polling data, in particular comparing voting intentions before and after the initial Ebola outbreak. This article provided me with some ideas as to what further research I could take on, considering various events surrounding search history data. In particular, the importance of identifying special events or news items that might have led to various search results that are not ordinary. Further on, research done by Kulkarni et al. (2012) was a great indicator of ways in which sales trends data can forecast new sales. In particular, looking at the models which the author used in order to come up with forecasting methods was an important step for me to consider as I move further on towards my research.

Overall, much of the research was shown surrounding forecasting of automobile sales or consumer preferences, based on Google Trends data, this further has influenced my overall approach making me believe that Google Trends data in my scenario might not play an immediate role in increasing the enrolment, but it will help me better forecast enrolment for the purposes of improving operations. Data limitations do impact my study and some of the goals, which we will discuss n the next section.

2.4.2 Limitations of search data

Although search data, such as that of Google Trends, is very important and has proven to be highly predictable, there are still various limitations it comes with. Search data is fairly easy to gather and is often very helpful, however it may not always provide dramatic increases in predictability (Goetz et al., 2010). Certain areas around the world have lower quality or no internet at all, which in some instances can pose as a limitation, if that part of the world is a target market for the analysis being done (Qingyu et al., 2013). In other instances, the noise of irrelevant information becomes a barrier in cleaning up the data and getting a sense of true trends and patterns within the search history (Qingyu et al., 2013). Although limitations exist, there are limitations with every type of analysis that we do, hence the overall usefulness and benefits outweigh the barriers that exist.

2.5 Forecasting

Traditionally, organizations could have survived on the fact that they are a well-known brand, or that they are a local gem, or even that they tend to sell quality products, however in today's highly competitive business environment that is not possible. Forecasting is a technique that organizations can use to plan ahead and not only to win, but to simply survive the competition. Forecasting is an important technique for many areas of the organization, in particular regarding future management planning. Organizations continuously look for ways in which they can make more effective planning, in order to compete more efficiently (Waters, 2005).

Taylor and Letham (2017) argue that regardless of an industry an organization is in, it must engage in capacity planning to efficiently allocate resources and goals, allowing it to measure performance relative to the baseline. Through forecasting, organizations are able to make more effective planning, however it is often fairly difficult to come up with the appropriate and high-quality forecasting techniques. Taylor and Letham (2017) argue that completely automatic forecasting techniques are hard to customize and also not very flexible on catching various assumptions. On the other hand, analysts within an organization usually have very specific training on products or services they support, and don't have much experience or training with time series forecasting (Taylor & Letham, 2017).

Although many define it differently, everyone agrees on the importance of forecasting. Rakhimov and Kankarej (2015) define forecasting as an estimation of some variable of interest at some specified future date. Forecasting is defined by Golden et al. (1994) as the ability to predict, project or estimate a future event or condition which is external to the organization's control and is able to be used as the basis for future planning. Waddell and Sohal (1994) further add on that given a set of certain assumptions forecasting allows one to predict or simply describe what will happen and gives examples such as sales demand, cash flow or employment levels. An important aspect to consider when thinking of forecasting is the external environment and condition, because forecasting as a projection into the future of expected demand depends and is projected based on the external conditions and not only the internal set of data points (Mentzer & Moon, 2005).

2.5.1 The role of forecasting

Prediction plays one of the most important roles in strategical and decision-making within higher education institutions (Cruz et al., 2020). This is in particular important when studying historical, current and future trends related to enrolment. Increasing demand requires intelligent forecasting models. With more accurate demand forecasting, companies will be able to develop strategic marketing plans that can explore and take advantage of future markets along with their current ones (Song, Witt, & Li, 2009). With more complexities within the environment, the more organizations are required to make daily changes to their forecasting requirements and to evolve continuously.

It is important to note that due to a globalized business market, and very different market conditions in today's world, forecasting has become more complex and much of the literature tends to focus on artificial intelligence as a means of forecasting for demand (Zhu et al., 2019). With no barriers to communication, less traveling required, consumer more in control and a highly competitive global environment, forecasting needs to expand beyond anything it has ever dealt with in the past. This brings a lot of complexity to the management planning team and requires organizations to be more creative in how they approach their forecasting techniques.

The role of forecasting is within many functions of an organization, starting with marketing – where we use forecasting in order to look into ways in which we can forecast market size, market trends and market penetration rate (Makridakis & Wheelwright, 1989). In a highly competitive global world, where resources are reduced, big data is introduced and online data storage and availability is increased, the demand for more accurate forecasting is of essential importance. Research done by Makridakis and Wheelwright (1989) notes the importance of forecasting within other departments as well such as finance and accounting. It is important to note that all of the departments require forecasting for the sustainability and not just for an improved decision making.

More recent literature suggests that the evolution of technology has led researchers and organizations to dive deeper into the forecasting models in order to build their business plans and events surrounding those predictions (Meenakshisundaram et al., 2019). The literature also suggests that there are barriers with new technologies and big data applications that organizations will run into, as the selection of the right forecasting technique requires insights

into historical data, mapped with the current market conditions, while considering market expectations which a lot of times organizations don't have the data for, or don't necessarily know how to properly analyze (Meenakshisundaram et al., 2019).

Along with barriers associated with forecasting, Chen's research on forecasting of student enrolment enables an understanding of the complications surrounding the development of a good forecasting model for enrolment (Chen, et al., 2009). Although it is quite an important concept, an accurate enrolment forecast is very difficult due to unexpected enrolment patterns, uncertainty of forecasting methods, and uncertainty surrounding the collection and measurement of data points that have a direct impact into enrolment forecasting. More recent literature focuses on utilizing technology and data-driven methods in order to improve forecasting.

2.5.2 Time-series technique

Times-series analysis is defined as sequential and ordered collection of data through equally spaced time intervals, that can be used to forecast future values (Wei, 1994). The overall assumption surrounding time series analysis is that the data points close to each other are correlated. More specifically, this means that future values will be based on previously observed values (Yang & Liu, 2019). Time series model is considered as one of the simplest models for developing a trend analysis in forecasting (Barak & Sadegh, 2016). Traditional statistical models of time series approaches include moving average, exponential smoothing and ARIMA (Barak & Sadegh, 2016).

Amongst all, ARIMA model is one of the most widely used time series models across various industries (Suganthi & Samuel, 2012). ARIMA is a forecasting technique that involves autoregressive and moving autoregressive processing, making sure to smooth out any inconsistencies related to short-term fluctuations. Given that around 40-50 years of data is important for this type of analysis, the introduction of seasonality to ARIMA model is necessary. SARIMA is an extension of ARIMA and takes seasonality into account. Due to the fact that there is a lot of seasonality associated with data within almost every industry, the seasonality aspect will be very important to assess.

2.5.3 Machine Learning

Artificial Intelligence (AI) is an important concept that has been utilized in a number of different cases across various industries, automating many applications (Makridakis, 2017). AI algorithms are capable of learning and improving by trial and error, this allows for an improvement of performance over time (Makridakis, 2017). Hence, the use of AI algorithms is beginning to be explored by modern literature for the use of forecasting methods. Machine learning is a field of computer science that is considered as an AI method utilized for forecasting (Voyant et al., 2017). It is certainly a method that is used to achieve higher forecasting accuracy, due to its ability to self-correct and handle big data.

Machine learning is in particular important for finding relationships between inputs and outputs, allowing the model to be used in cases of pattern recognition, classification problems, spam filtering, data mining and forecasting problems (Voyant et al., 2017). Data mining through the use of machine learning allows for a much easier and more comprehensive understanding of big datasets (Voyant et al., 2017). Through the integration of time series forecasting, machine learning becomes more effective, as many prediction problems involve a time component. Although the integration between the two creates a very effective model, it is also more difficult and complex to accomplish.

2.5.4 Segmentation

Martin (2011) defines market segmentation as a way to divide a large homogenous market of potential customers into clearly identifiable segments based on specified criteria. That criteria could be based customers meeting a certain-criteria, or customers that have similar characteristics that lead to them having the same product/service needs (Martin, 2011). In a sense, these segments are made up of customers who will respond similarly to marketing strategies, they tend to share common interests, needs, wants and demands (Martin, 2011). Based on this information, market segmentation is essential to effective marketing, as most companies don't have enough resources to effectively target a mass market (Sheth, 1967). Hence, targeting the specific market segments that need your product/service is the most effective marketing approach.

Smith (1956) is responsible for introducing the concept of market segmentation to marketing, suggesting that one large, heterogeneous market actually consists of many smaller homogenous market segments. The concept has proved to allow organizations to position themselves in a unique way, offering a superior product to a chosen segment and by doing so developing a long-term competitive advantage (Dolnicar, 2020). Market segmentation strategy does also lead to reduced marketing expenditures, as we tend to communicate with a much smaller number of customers (Dolnicar, 2020). Cluster analysis tends to be one of the leading techniques used by organizations, however there are others such as neural network methods (Mazanec, 1992).

Further on, Ouwersloot and Odekerken-Schroder (2008) argue that heterogeneity within communities exists and treating them the same way, sending them the same messages is a mistake. Essential for marketing is that communication strategy should vary differently amongst the groups Ouwersloot and Odekerken-Schroder (2008). There are many ways to segment the market, but some of the most common ones are based on demographic segmentation, psychographic segmentation, behavioural segmentation and needs-based segmentation (Lovelock and Wirts, 2011).

Market segmentation is exploratory in nature, which complements my research objectives with this thesis. The exploratory nature allows for market segmentation to be embedded in the everyday work environment, creating a need for strong change management initiatives. Market segmentation does not lead to one single correct solution, it depends on the data and repeated analysis, along with testing of the segments (Dolnicar, 2020). Traditionally market segments were something we update every few years, however with the unpredictability within today's business environment, constant changing consumer behaviors, it is important to consider an ongoing strategy behind segment monitoring, alerting users to noteworthy changes in real-time (Dolnicar, 2020).

Some literature does criticize the concepts of market segmentation, as a process that is based on the premise that the given market is heterogeneous and can be segmented (Wind, 1978). Although some researchers such as Wu et al. (2018) continue to argue that every market can be

refined into significant sub-markets, there are others that still to this day don't. Early on, Young et al. (1978) disagreed, and suggested occasions in which market segmentation is not useful. In instances where the market is so small that marketing to a small portion of individuals is not profitable, where heavy users continue such a high proportion of the sales volume that they comprise the only relevant targets and where a brand is the dominant brand in market (Young et a., 1978). Very early on, other researchers such as Collins (1971) challenge the assumption that every product can be placed in a market segment, and considers that not all consumers can be placed in a segment and the focus should really be on the penetration and buying rather than on the segment size. Although all of these criticisms are valid, they are not widely accepted within literature and do not challenge the theory surrounding market segmentation.

2.6 Self-Report Survey Measurement and Design

Throughout Action Learning Cycles, I realized the value of feedback and noticed how the use of self-reported surveys could provide me with further insights into the segmentation of student consumer behavior. Self-report surveys are one of the most commonly used approaches for measurement within social sciences. Marketing discipline has utilized surveys for decades now in order to understand the attitudes and values of people in regards to domain constructs of interest. This review will focus on survey practices from literature and research of experts and scholars that have been conducting survey research and experimental design for many years now. The literature review of this sections was done after limitations were found in my research to help inform further action for future research. The literature reviewed will help provide some of the most important techniques, rules-of-thumb, and the most important things to consider when designing, developing and executing self-report surveys.

2.6.1 Survey Design

Utilizing self-report surveys helps us measure attitudes of participants regarding specific concepts. When thinking about attitudes, these are defined as collective evaluations of psychological or physical constructs as good or bad (Ajzen, 2001). It is important to note that accuracy and output of those attitudes measurements depends on how defined the concept of

interest is, which we tend to capture by tested survey items as valid and reliable (Diefendorff, 2020).

Diefendorff (2020) argues that one of the key items to consider is your target audience when designing a survey. Designing a good survey largely depends on understanding your target audience and conveying why their participation is beneficial to them (Diefendorff, 2020). The most common value proposition for survey participants tends to be that they may benefit from self-reflection. However, if the focus of the survey is to assess attitudes on products or services then explaining to participants that their feedback is important tends to make them feel valued. Moreover, the most common way to incentivize participants is through a tangible reason such as gift cards or monetary incentives. A more tangible reason tends to increase response rate, but some argue that it might hurt the overall authenticity of response. Regardless of an incentive, it is important to communicate properly that their participation is anonymous and voluntary. This helps us communicate benefits and establish trust with prospective survey participants. The communication aspect of how the survey will be useful and/or how it will make a difference regarding the research topic is a crucial step to consider.

2.6.2 Survey Structure and Knowing Your Participants

One of the key insights from literature is that there is a lot of science behind building surveys. Item response options should reflect those that are most likely responses the participants will generate, and if the response they generate is not available then they will try to match it to the best one (Feldman & Lynch, 1988). As a lot of decision making is automatic and unconscious, surveying can help bring conscious attention and guidance to areas that people might not normally pay much attention to or think about. It is extremely important to think about how a survey can guide peoples' consciousness (Feldman & Lynch, 1988). Feldman & Lynch (1998) discuss the topic of diagnosticity, which determines how much a respondent will use their response to a question as a rule-of-thumb or cue for answering a subsequent question. Furthermore, diagnosticity of answers are not mutually exclusive to one another – Judgment A may influence Judgment B in a different way than Judgment B might influence Judgment A (Feldman & Lynch, 1988).

Furthermore, it is necessary to consider the notion of demand characteristics in terms of survey participants (Berkowitz & Donnerstein, 1982). What this entails is that demand characteristics encompass the idea that participants are motivated to comply with research and experimental settings, thus may naturally be inclined to give desirable responses on behalf of the researcher and what they believe the goal of the study is (Orne, 1962). This will lead to responses that are less authentic and reliable. However, the context of item content is not the only impacting structural context of a survey. Physical context of items does have an influence on answering and the overall results (Harrison & McLaughlin, 1996).

2.6.3 Influence on People's Attitudes and Judgments

The formation of judgements and attitudes during survey measurement is a complex process, which is influenced by the measures themselves. Consciousness and the availability of knowledge one has prior to measurement play an important role in self-generated survey responses one already held in belief. However, retrieval processes utilizing available knowledge based on the survey measurement can cause people to form attitudes on the spot if they have no prior knowledge on the domain or subject (Feldman & Lynch, 1988). This is important as it alludes to the subjectivity of how we measure attitudes, which may have different responses, despite how we intended our surveys to be answered. These processes can bias and influence the diagnosticity of one item on to the next, where more knowledge on one item can help strengthen participant attitudes influencing how they will answer subsequent items. Tourangeau & Rasinski (1988) describe a four-step process regarding how participants respond to survey measures that intend to capture their attitudes and values 1) interpreting the question 2) retrieval of beliefs and feelings 3) rendering judgment and 4) reporting the answer.

2.6.4 Item Context and Interpretation

Research by Tourangeau & Rasinski (1988) argues that items can provide a context for answering and interpreting other items. Furthermore, items and questions in a survey can serve as informative cues, whether conscious or unconscious, in influencing how participants think about and respond to subsequent items, or they may go back to previous items and change their responses from newly processed information. There are also order effects that occur when participants engage in responding to survey items. Research by Bradburn (1982) revealed that

general questions on happiness had more negative responses when they were asked after specific questions on marital happiness, thus illustrating how broader questions can impact more niche ones and vice-versa.

Priming is a survey context and structure concept that one should consider when crafting the order of items. Priming can activate stereotypes and biases from the contextual information surrounding an item that influences attitudes in response to subsequent items. This assumes a structure of connection between items and ideas, where activation for one item becomes relevant to retrieval processes for another item (Tourangeau & Rasinski, 1988). Another context effect to be aware of when designing and structuring surveys are contrast effects. Contrast effects can occur when items or questions embody an extreme message to a participant, which can anchor their response view and pattern. Tourangeau & Rasinski (1988) describe an even better example based on the work of Strack et al. (1985) where they had survey participants in two groups, where one group was assigned to recall positive life events prior to answering survey items, while the other group was assigned to recall negative life events prior to answering survey items. The survey that participants took measured life satisfaction, where those in the negative group ended up with higher life satisfaction scores, while those in the positive group ended up with lower life satisfaction scores. This example illustrates how psychological context and order effects in surveys can elicit contrasting responses, thus it is important to consider if such bias responses are intended based on your survey structure; if not it can be wise to vary up ordering to mitigate bias.

2.6.5 Pilot Testing

One of the common themes within literature has been a discussion surrounding pilot testing. A pilot test is an initial, exploratory implementation of your survey (Cumming, 2014). Initial tests like these are helpful, because they can help determine whether or not measures and items are working as intended, or if an intentional manipulation has elicited a desired effect (Pedhazur & Schmelkin, 1991). Bausell (1994) states three specific issues that a pilot test helps to address for your measures:

1. How likely is the intervention to affect the outcome variable? ￼
2. How responsive is the outcome variable likely to be? ￼
3. How feasible are the experimental procedures in general? ￼

In terms of actually running or administering a pilot test, Bausell (1994) recommends keeping it as simple as possible, but emphasizes considering bringing in a subject matter expert or consultant with regards to the domain of measurement. There are three rules that Bausell (1994) emphasizes with respect to pilot testing, which are particularly important for surveys:

1. Be as systematic as possible: it is important to be as precise and defined as possible in terms of how you administer your pilot test.
2. Keep good records: make sure that you have detailed and documented procedures with regards to the survey design you implement for your pilot sample and how it may change or compare with your main survey sample.
3. Conduct as many pilot studies as necessary to maximize the chance that your main survey elicits the intended or desired results that you can to the best of your ability control.

Although not often a widely used practice, it is clear that it can be a beneficial practice for research.

2.7 Online Focus Groups

Throughout Action Learning Cycles, I realized the value of feedback and noticed how the use of focus groups could provide me with further insights into the segmentation of student consumer behavior, in particular provide me with qualitative context that can add important insights into my future research. Focus groups are one of the most commonly used approaches for exploratory analysis. Focus groups can be used at the stage of research when we may be near the beginning of the research process and have little existing information on the psychological constructs (e.g., attitudes, preferences, experiences, emotions, behavioral intentions) that characterize an individual. At this stage of the research process, focus groups can be used to provide insights into the context that exist toward this specific research scenario and the insights tend to be wide ranged. The term "wide" is emphasized because at this stage of research we want to have the fullest picture possible of what characterizes the focal object so that further research does not miss important characterizations. This wide collection can then be used as the basis for more targeted research, such as with surveys and A/B experiment. Due to COVID-19, one area of research that has been receiving a lot of attention as of recently are is the area surrounding online focus groups.

The available literature for the online setting of focus groups is still evolving, with much of it existing as subjective reports from researchers. As the literature on the online setting of focus groups is still evolving, there are not necessarily many best practices that can be drawn, rather it is more based on the best practices that are currently known. Nonetheless, the literature that was inspected by the author contain contains important lessons that merit repeating and is worth mentioning. In additional to critical lessons, more subjective recommendations are also offered based upon tentative observations. It is expected that the reader will be able to differentiate between the critical lessons and the subjective recommendations, and, hence, apply subjective recommendations according to discretion.

2.7.1 Software Needed

Large enough differences exist among software that can be used for meetings that the particular software should be carefully selected. Moreover, there have been rapid changes in software since the beginning of the pandemic in the US whereby software is becoming more similar than different. It is widely expected that the software is free for participants (Lobe, 2020). The overall administration by an organization should be seamless, by making sure that non-organization members should be able to easily join. Archibald et al., (2019) argues that one of the key aspects as it relates to the software is that it should have built-in recording capabilities. Utilizing third-party software can cause some difficulties as updates to either the meeting software or the third-party software can introduce incompatibilities between the two.

2.7.2 Participants

One of the key items of discussion currently regarding online focus groups is that limiting the number of participants to the number of participants that can fit on a screen is one of the best practices (Lobe, 2020). Archibald et al., (2019) discusses the importance of holding a practice run with the participants a day or so before the actual focus group to identify critical technical issues. Participants might also feel less stressed if they have ample time to address technical issues. One of the core concepts discussed across online focus groups and the traditional methods, active listening is an important aspect to utilize throughout focus groups (Louw, Watson Todd & Jimarkon 2011). Active listening allows us to ask the why questions and gather the depth of what we are searching for.

2.8 Chapter summary

Well-established theories, including Kotter's Change Management Theory and Rogers' Innovation Diffusion Theory, support the importance of a change management process for adoption of innovation and change within the organization. However, with an increase in digital disruption during the pandemic, these theories are not as insightful when it comes to understanding or shaping the innovation and change initiatives across an organization. Digital transformation and the use of google trends have received considerable attention recently in the business environment. However, the literature surrounding these topics has not been well developed, and consists of many gaps. While there are many studies that focus on digital marketing, the use of data from Google Trends for customer acquisition and the process to better forecast are not well developed within the literature.

Literature shows that Google Trends is not an average SEO tool, it is one of the most convincing tools to provide marketers with seasonal trends. The tool can also be used for competitive analysis, industry trends and finding your niche within the market. As a tool that relies heavily on keywords, the ability to analyze and understand how people communicate in the online environment. Literature shows that research surrounding the use of Google Trends is very much limited to how large brands have been using Google to search for information and the seasonal trends companies are dealing with regarding their products, competition and other industry aspects. Industries such as retail have shown slight use of Google Trends for customer acquisition, but higher education industry has not seen much use of digital analysis tools such as this. Chapter three will focus on providing insights into the research design and methodology taken to conduct this research.

3 Methodology

3.1 Introduction

This chapter presents the research methodology and the direction taken to design and conduct research throughout the thesis journey. The methodology was designed specifically to address the management problem of utilizing search query data for improved customer acquisition. The critical thoughts and philosophical position pointed out the ontological position constructivism and epistemological position positivism and relies on statistical methods to determine significant results. Moreover, my ontological and epistemological position, together, influenced the methodology and methods research approach and design (Crotty, 1998).

In this chapter, my focus is on discussing and outlining the philosophy of my research. In particular, the discussion will be surrounding research philosophy, the overall research methodology, the research design, data collection process, data analysis techniques use, ethics, and trustworthiness and credibility of the research.

3.2 Research philosophy

Action Learning and Action Research (ALAR) is an integrated concept and practice that inspires learning and knowledge creation during the writing of this thesis. The philosophical assumptions supporting action research are based on (1) epistemology, which is focused on creating new knowledge and how we learn by doing, (2) ontology, which is focused on identifying our assumptions about the nature of being, becoming, existence or reality, (3) paradigm, methodology and methods provide a way of solving common issues collaboratively and (4) axiology, which is focused on addressing our values and worldviews that are responsible for our actions (Zuber-Skerritt, 2019). Utilizing action learning sets with regular reflections on learning and outcomes will shape the overall direction and philosophical understandings can be gradually developed through this process, before action research cycles begin in project teams (Zuber-Skerritt, 2019).

When it comes to exploring the essence of being and the truth of our existence (ontology), my philosophical stance tends to favor a pragmatic and empirical perspective. My position is that the

physical world consists of things that are observable, and our perception and interactions with our surroundings shape our understanding of what is real (Ashworth, 1997). Ontologically, I align with a realist stance, acknowledging the existence of an external reality that can be objectively studied and understood. In terms of my approach to acquiring knowledge (epistemology), I align with a combination of empiricism and positivism. I argue that sensory experiences play an important role in obtaining knowledge and that such knowledge can be confirmed through empirical evidence. This practical method highlights the importance of quantifiable and visible information when forming a dependable understanding. Additionally, my viewpoint on knowledge is rooted in positivism, which has a specific emphasis on the scientific approach and significantly focuses on factual, provable data (Bryman, 2001). Aside from these viewpoints, my philosophical position also includes some aspects of pragmatism. Pragmatism places importance on the real-life outcomes and usefulness of one's beliefs and actions.

Given my empirical epistemological stance, utilizing Google Trends aligns seamlessly with the pursuit of knowledge that is based on observable data. Google Trends provides a valuable tool for extracting real-time, user-generated data related to search queries. The empirical foundation allows for a deeper understanding of current trends and interests in the context of university recruitment. Reflective of this perspective, the positivism paradigm is focused on a realist ontology that the reality is somewhere out there independent of my knowledge (Bryman, 2001). Google Trends provides insights into the shared interests and concerns of the public. Universities can gather unbiased insights on the interests of prospective students and shape their overall recruitment and marketing approach by examining popular search questions, which reflect current societal trends. Google Trends Analysis, as a data-driven tool, enables higher education institutions to make informed decisions that are based on the analysis of quantifiable data. The methodological approach aligns with a positivist epistemology, allowing the recruitment efforts to be based on reliable information rather than subjective assumptions.

Further on, integrating a pragmatist view, the choice of Google Trends Analysis is theoretically and pragmatically an effective decision to make. Pragmatism focuses on the importance of selecting tools and methodologies that result in practical benefits. Google Trends is a dynamic and adaptable tool that allows universities to make actionable insights that can be immediately

applied to enhance recruitment efforts. Incorporating pragmatism into my philosophical position improves the argument of focus on the practical effectiveness of Google Trends Analysis in university recruitment efforts.

Inductive reasoning focuses on drawing general conclusions from specific observations (Flach & Kakas, 2000). With my philosophical stance of empirical observation and a realist ontology, an inductive research approach focuses on gathering data from Google Trends Analysis and deriving generalized patterns, trends, or theories. This approach strongly aligns with the belief that knowledge is built from the ground up with observations and experiences. Abductive reasoning looks for the best explanation of observed phenomena (Flach & Kakas, 2020). In this research study, given the pragmatic aspect of my philosophical stance, and abductive research approach involves proposing explanations for the trends, patterns and relationships that are found in Google trends analysis.

3.3 Evidence Gathering

I began my research by conducting critical literature review to gain in-depth insight, determine current research and knowledge that has been done (see chapter two). Before conducting literature review, which helped me gain insights, I focused on developing a theoretical framework from the research question and the constructs that appeared to influence change management and adoption of digital marketing practices, while aligning with my organization. For example, change management practices across the higher education industry appear to be immature compared to many other industries, putting my organization at a risk of operating within silos.

The literature review was an inductive discovery process to generate theory for developing the conceptual model and data collection questions for conducting the research. Furthermore, my research related to an objective insider and positivist inquiry, increasing the ability to predict on trends that were found. In order to set up my research the proper way and to encourage action learning within the organization, I needed to gather insights from those that could act as change agents by forming ALC in order to evaluate and shape existing insights, such as understand the recruiting efforts across different departments and selection of keywords to be used for analysis.

3.4 Research Methodology

The ontological and epistemological positions dictated the methodology because positivist paradigm is objective and requires collection of scientific data that is precise and based on measurement and is often analyzed using statistics with the intention that the findings are generalizable (Mukherji & Albon, 2010). Moreover, the collection of scientific data requires a quantitative approach to investigate a phenomenon through utilization of numerical data and statistical analysis (Park & Park, 2016). Therefore, my methodological approach was quantitative, focused on collecting data that is valid, reliable and representative. In contrast, critical social theory in relation to action research emphasizes reflection and action, theory and practice as some of the most important elements of a critical approach when bringing about change in action research (Hockley et al., 2012). Hence, bringing about change will require dialogue and insider participation by forming ALS to support the process.

Furthermore, my research design focused on first-person inquiry until data collection, and then, my research evolved to the second person inquiry. The first-person inquiry focused on a research process undertaken by researchers as an inquiry into their own actions, process of attention to detail, understanding how my assumptions and beliefs shaped the process and how I could use the data throughout my research. The first-person inquiry focused on constructing the action research, identifying the overall situation and the research question associated with my problem. Hence, reflection is one of the main indicators of quality in first-person inquiry (Marshall, 2001). Through the literature review inquiry, I was able to develop insights and knowledge, review and analyze data in order to formalize my research questions and start to investigate further through the ALS with change agents. The second person inquiry was inquiry through ALS, where I researched with change agents who were interested in research. The third person inquiry was distributed to other stakeholders within the organization that are outside of the College of Business and that are interested in this research. However, I also collected a lot of secondary data to gain in-depth insight about digital marketing efforts and the university enrollment efforts to gain a broader sense of how decisions are currently being managed.

3.4.1 Research Design

Quantitative research methods tend to be characterized as data that is subject to statistical analysis and determined using predetermined sets of processes and standards to collect the data (Queirós et al. 2018). Quantitative data collection focuses on having a larger sample size and tends to be representative of the population (Queirós et al. 2018). The research design was specifically defined and elaborated on by the management problem, the overall workplace situation and the research questions used to address the problem. A significant aspect of the research design was focused on the literature review inquiry which then influenced the overall data collection process and later was responsible for supporting the research trustworthiness and credibility. To gain an understanding of the literature surrounding my workplace problem, I reviewed both the practitioner and academic publications. However, data analysis using Google Trends and enrollment data at the University of Akron provided in-depth knowledge of how segmentation can improve the overall acquisition process in the real world. However, the participation cycles allowed me to understand better what was required in practice and shaped the overall understanding surrounding the workplace problem.

When considering quantitative and qualitative research, Park & Park (2016) defines quantitative research as a statistical analysis approach utilized to investigate a phenomenon through utilization of numerical data and statistical analysis. Further on, qualitative research is focused on observations, discovery, and inquiry, utilizing the phenomenon, case studies and experiences for its data collection and analysis (Denzin & Lincoln, 2011). On the more extreme aspect of data collection, the literature focuses on defining two different approaches, ethnography, and phenomenology, which tend to be qualitative in nature (Hammersley, 2003; Creswell, 2003). Ethnographic studies require the researcher to be very involved in research, by participating in their natural setting over a longer period (Creswell, 2003). This type of a data collection helps a researcher study people and their cultures (Creswell, 2003). Furthermore, in business and psychology fields, quantitative research has been one of the keyways researchers have collected data, however qualitative research has been gaining an increasing importance (Gelo etc., 2008).

Ethnography and phenomenology were two of the data collection methods that I have been considering throughout my doctoral studies as important concepts to understand the depth of my

research. However, the two methods were something that I ended up discounting as methods to utilize in my research. One of the main drawbacks was the length of time it requires to conduct these types of studies (Khan, 2018). Another major concern of utilizing this type of data collection method was the breach of privacy, especially as a lot of enrollment decisions are made in the comfort of the students' own homes. Although I focused a lot on this type of a data collection method throughout my doctoral studies, I didn't find it as something that would provide me value for my current workplace problem, as I needed a much larger sample size and a much broader look into understanding the overall population.

As the increase in qualitative research has started to gain more interest, there has been an enduring debate between quantitative and qualitative approach, which has led to an increasing development of mixed methods approach. The mixed methods approach is responsible for integrating both the quantitative and qualitative approaches in the study. Gelo etc. (2008) argue that through the utilization of mixed methods approach, the limitations of purely quantitative and purely qualitative approaches tend to be overcome. Therefore, this thesis focuses on the use of quantitative data collection, with an understanding that there are specific limitations that need to be overcome because of the lack of use of qualitative data (Queirós et al. 2018). However due to heavy involvement with ALS cycles, the overall approach resembles that of a mixed methods approach.

3.4.1.1 Strategy

The research strategy is heavily influenced by action research as that is the primary way in which data was collected throughout this study. The research was designed to segment student personas using online search data, to improve university enrollment. To start off, I selected two action learning sets with my co-workers, whom I identified as change agents to actively participate in my research. This allowed me to include them in my research immediately, but also allowed me to best identify the keywords important to the University of Akron, and keywords that will be used for data collection through Google Trends. Further on, I started to utilize Google Trends to analyze branded keywords such as "The University of Akron," "Akron University" and "Akron Programs". The analysis of the identified keywords was used to introduce the conceptual ideas of keywords to the ALS, allowing me to start with the data collection. I used two action cycles with

each ALS and collected data from Google Trends in between those action cycles to best authenticate the keyword selection gathered from the action cycles. Figure 8 focuses on providing the outline of the research design and strategy that was used for conducting the research in this thesis.

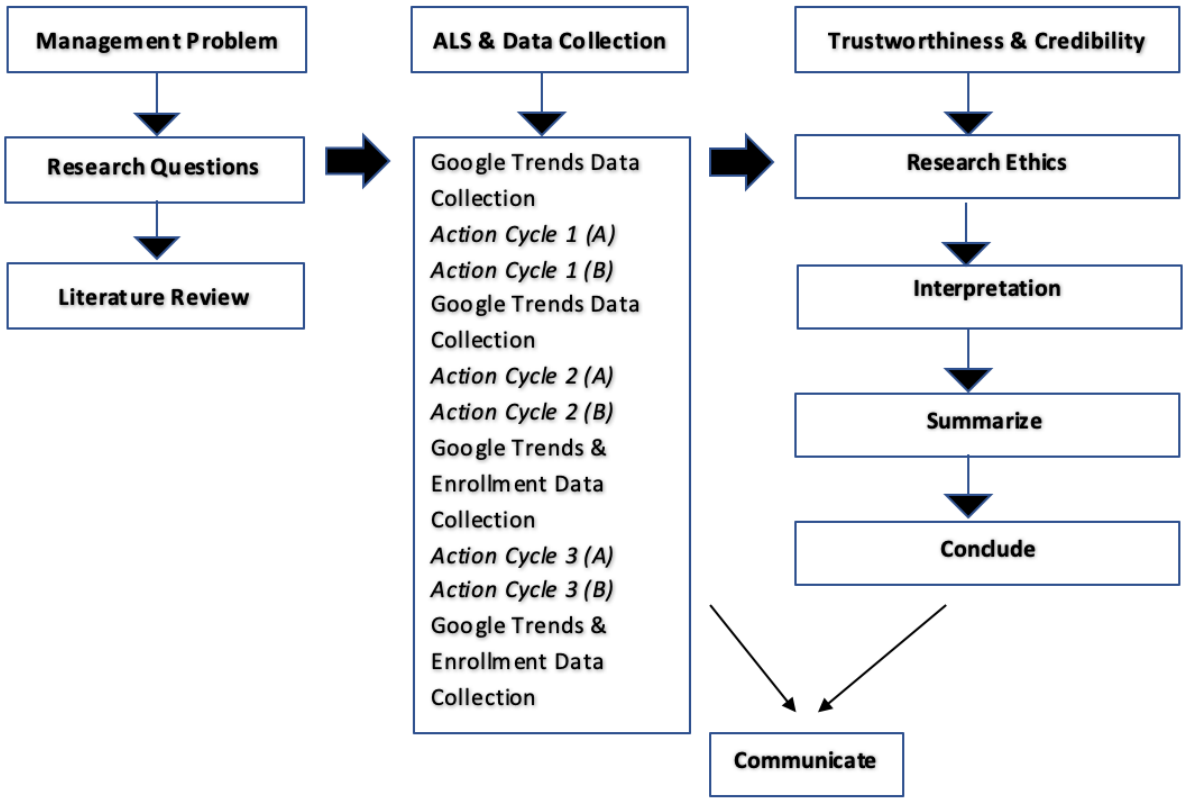

Figure 8: Research Design and Strategy Outline
Source: Author

Figure 8 outlines the overall research design and strategy that was used for conducting this research. The overall process of identifying conceptual theory began prior to data collection with the literature review. Two keywords were initially analyzed to begin data collection in Google Trends, action cycles were then used brainstorming sessions to verify and better identify keywords needed. Further on, google trends and enrollment data collection along with action cycles unfolded in a sequence as represented in Figure 8.

3.4.2 Action Research Approach

One of the key concepts integrated throughout this study is action research. In academia, collaborating with practitioners to improve knowledge, competitiveness, and sustainability is one of the key strategic initiatives, throughout which action research is certain to be part of (Gold et al., 2002). Throughout my doctoral studies and various modules, I was introduced to the concept of action learning. Action learning was instrumental in introducing me to the concept of clearly identifying the right problem. Throughout my studies, many different concepts were instrumental in helping me better identify the business problem and knowledge surrounding the problem, however the most important ones were the Rich Picture Diagram and Fishbone Diagram.

Throughout the use of action learning, participants tend to heavily influence the process by their values, previous experiences and overall systems thinking. Reg Revans was responsible for developing action learning as a way for leaders within the organization to confront problems, especially those that tend to be resistant to currently known solutions (Revans, 2011). As a manager, the reflection of who I am as a manager and in particular the kind of an influence I have within my organization was an important concept from the personal development perspective. Action learning process throughout my research depended on the quality of learning set interactions, critical reflection throughout the process, use of double-loop learning and reflexivity.

3.5 Data collection

In this study, the focus was on secondary data collection from a quantitative perspective. The core focus was on collecting data from Google Trends, and the University of Akron enrollment data was used adjacently for predictive analysis purposes. However, a strong emphasis was placed on ALS cycles, where the primary focus was on better identifying the data needed to search through Google Trends. Google Trends is considered a new source of big data, in particular this is important to note as the utilization of big data has been shifting from monitoring towards forecasting (Jun et al., 2018). Table 3 represents that data collection framework used within this research study. Big data is considered linkable information, focusing on containing a lot of data with complex data structures (Jun et al., 2018). Each encounter I have with the employees at the University generates data (small data), which is extremely important to give rise to big data, which is then analyzed and translated into information (Sacristán & Dilla, 2015).

Data Collection Type	Action Learning Sets	Data Collection Type
Google Trends University Enrollment Data	Decision concepts Feedback/Evaluation Feedback loop	Interactive Collaboration Observation 3 Action Cycles Secondary website data

Table 3: Data Collection Framework
Source: Author

3.5.1 Query Index Data

In the Interactive Advertising section (1.1.3) of this thesis, I discussed the gap within literature as it relates to utilizing tools such as Google Trends to measure success and efforts across digital marketing efforts for organizations such as The University of Akron. It was a discussion surrounding an article and a book chapter I co-authored in the Journal of Interactive Advertising (JIAD) which was focused on analyzing article within this journal, since it was founded in the Fall of 2000 until 2017. We found that majority of articles within this Journal examine internet advertising broadly (29%), followed by social media (15.6%), gaming (10.2%) and interactivity (5.4%). The trends show internet advertising growing until 2006, followed by social media immediately after that (Daugherty and Djuric, 2017). In the most recent years, we do see the trend of eWom and mobile growing, hence showing a continuous evolution of interactive advertising (Daugherty and Djuric, 2017). We also find that articles surrounding measurement and privacy are scarce within this journal (Daugherty and Djuric, 2017). In an updated search to review if there were any major changes within the last four years, the only significant growth has been within social media. This still shows a gap within literature as it relates to utilizing tools that provide online query index data to measure success and efforts across the digital marketing efforts for organizations such as The University of Akron. Because the topic discussed is a fairly new concept and prior academic research is limited, this research is exploratory in nature.

Google Trends, an online tracking website developed by Google, was used to explore web behavior related to university search patterns. Google Trends is a time series model used to measure volume of queries users enter Google in a given geographic area (Choi & Varian, 2012). Google Trends database contains a log of online search queries dating back to 2004. Besides measuring the volume of Google searches, it provides a popularity ranking, showing which keyword was more popular based on the volume of searches during a specified period in comparison to the other keywords/terms. This section consists of three parts: 1) selecting specific relevant keywords; 2) constructing a Google Index, which provides the data and popularity ranking; 3) discussing insights based on Google trends data.

Given data on search activity from Google, the approach in this study is summarized as following: 1) search for keywords/terms regarding university enrollment within the Northeast Ohio area; 2) process noise within the data – eliminate any keywords that seem unrelated to the university; 3) reorganize and better clean up search data to be ready for analysis; 4) run regression analysis; 5) process the demographics behind keywords and 6) segment based on the type of a consumer behavior.

Collecting search query data was essential to my research because the process and data provided alternative perspectives and insights from those outside of the organization and authenticated insights collected from ALS. The purpose of collecting search query data was to understand prospective students' online search behavior when looking to enroll in a new school/program, gain insights into how this correlates with enrollment and the impact demographics have on the segmentation of prospective students based on search. Although my research focuses on the University of Akron, some keywords selected apply to many other institutions across the country. I used ALS cycles with my colleagues to better understand the framework needed for selecting the appropriate keywords. The purpose of selecting keywords that might apply to other universities across the country was to establish the impact a geographic location might have on the search behavior.

3.5.1 Quantitative Data

Google Trends provides data on how specific keywords have trended in searches over time, enabling a business to analyze market behavior and calculate market share trends (Deeb, 2022). Leveraging Google search query data for segmentation analysis and integrating enrollment data from the University of Akron provides an even more nuanced understanding of user segments. When merged with Google search query data, the information enables a deeper understanding of the specific interests in informational needs of distinct segments, allowing for a more personalized approach. Deeb (2002) uses an example of the term “restaurant furniture” in 2020, and how the data revealed industry movements, such as the impact of COVID-19 and the increase in outdoor furniture demand.

Google search query data collection process is done through interactions users have with the search engine. The platform categorizes searches into 1200 categories using a probabilistic algorithm (Varian & Choi, 2009). This classification system assigns individual searches to one or more categories (Woloszko, 2020). The categories then follow a 5-level hierarchical structure(Woloszko, 2020). An example presented by Woloszko (2020) is that the category "Autos and Vehicles" would consolidate all searches related to cars, simplifying the process compared to keyword-based queries that would require explicit combinations of each possible car name and brand. When individuals enter a specific query into the Google search bar, their input is being logged, stored and ready to extract in real-time. The data that is included as part of this search has a couple of different aspects to it, the actual search terms, the rank (from 0 – 100), the date of the search, the geographic location of the user, and other relevant contextual information. Google provides access to aggregated and anonymized datasets through Google BigQuery, which then can be used for more in-depth analysis.

The University of Akron enrollment data was received from the University of Akron Institutional Research. The datasets included data over a five-year period, analyzing enrollment data with an average sample size of 15,000 students annually. This dataset did not include any personally identifiable information, ensuring the utmost confidentiality and privacy of the individuals involved and analyzed. The analysis focused on key variables such as student enrollment status, academic year, program of study, and geographic location. This dataset can be used for analysis regarding valuable insights into enrollment trends, program preferences, and regional distribution

of students without compromising the sensitive nature of personal information. By combining information on student's demographics, academic interests, and enrollment patterns with Google search query data, the university can create a comprehensive profile of the user segments. The general overview of how quantitative data for this study was accessed is represented in Table 4.

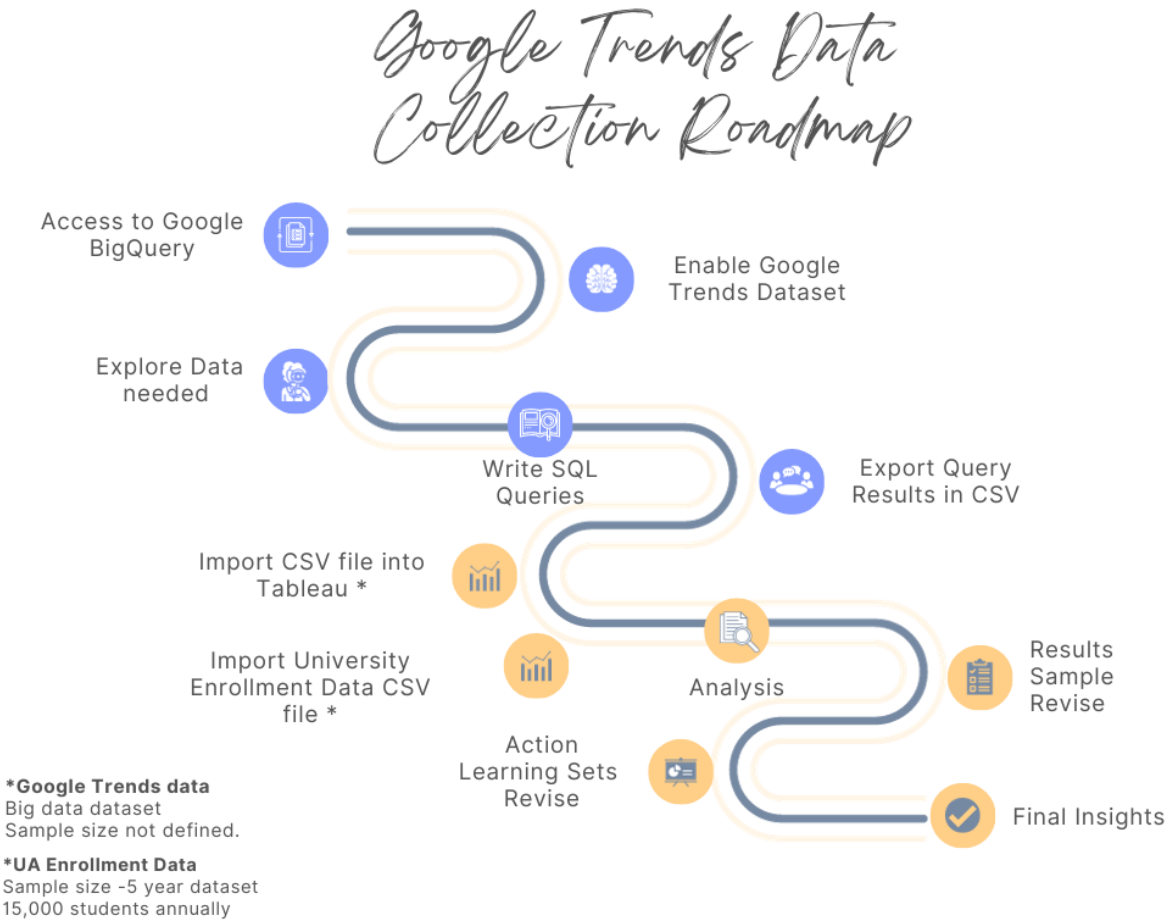

Table 4: Research Design Approaches
Source: Author

As shown in Table 4, the overall process of accessing data from Google Trends requires some steps to prepare, clean, and get data ready for analysis. Google Trends does not provide information on the exact sample size of the data it uses, it aggregates and anonymizes big data from its sources such as Google Search, Google News, and Google Images. Google does take the additional steps to normalize and scale the data to make it relative and comparable over time and across regions. While Google Trends is valuable for understanding the popularity of search

queries, it is important to note that it contains only certain variables which are used in this analysis, hence the importance of the University of Akron enrollment data to incorporate in the further analysis. Understanding industry trends through Google Trends is essential for companies to be able to assess their own performance relative to the market (Deeb, 2022).
StoryBase software, a relatively recent addition to the market, offers keyword analysis. An additional feature of the software is its capability to delve into age and gender data. This tool was integrated into the study to augment the dataset. In Table 4, during the revision step, in which a sample of the results was provided and revision occurred, data was amplified with the use of StoryBase in order to provide additional demographic data behind some of the searched key terms. Using StoryBase software, all relevant keywords from ASL discussions were employed to gather age and gender information linked to those keywords online. Delving into personas and target audiences introduces strategic considerations and potential for organic growth.

3.5.2 Qualitative Data

Collecting qualitative data during action learning sets involved gathering information about participants' experiences, reflections and the learning that occurred in the context of action learning. Action learning sets involved small groups of individuals that were selected based on their positions within the College and the university. The goal was to have a sample size of six to 12 participants per set who would be continuously involved in providing insights during the scheduled action learning sets and as equally involved in conversations outside of the sets, in a Slack channel that was created.

The qualitative data was collected in a couple of different methods including observation, reflection journal, group discussions, Slack reflections, and keyword outputs. Throughout the process, as a facilitator of action learning sets, I took notes on the group dynamics, interactions, and discussions that occurred during the sessions. With the use of open-ended notes I looked for ways to capture key behaviors, challenges, and insights. As a facilitator, I maintained individual reflection journal, documenting my thoughts and insights after each learning session. Some of the prompts I utilized for my reflection journal were: "What did I learn? How did the group contribute to my learning?" Throughout action learning sets, group discussions that were

structured using guiding questions to prompt participants to share their experiences, challenges, and key takeaways. After sessions, individuals were encouraged to engage in Slack Channel for reflection, a dedicated Slack channel was created for reflective discussions after each action learning set. Participants were encouraged to share their thoughts, insights, and challenges in this channel, while also reflecting on other participants' thoughts. Throughout action learning sets, I collected keyword outputs created by the action learning group and analyzed those keywords to gain further insight into the group's current situation and challenges.

In this study, qualitative data was analyzed using thematic analysis and coding methods. Thematic analysis is a method used to identify, analyze, and report patterns, trends, or themes within data (Braun & Clarke, 2006). This method provides a detailed organization and description of the dataset, interpreting various aspects of the research topic (Braun & Clarke, 2006). Data organization and familiarization allowed me to group data from multiple sources together, familiarizing myself with the context and the purpose of each data collection method. With thematic analysis, I was able to identify recurring themes and patterns within the qualitative data. It was important for me to look for commonalities and differences across observations, my reflective journal, group discussions, Slack channel reflections, and keyword outputs. Further on, qualitative coding method, involves systematically categorizing and labeling different parts of the data in order to identify patters, trends, or themes (Richards, 2005). The application of coding to categorize information into themes or codes based on the nature of the content allowed me to gain insights into the emerging themes.

In this study, qualitative data was instrumental, yielding many outcomes that enriched the overall process. The qualitative data played an instrumental role in discovering insights into the overall process while still investigating, offering an interesting understanding that provides the context behind the quantitative measures. The importance was particularly known in guiding the iterative process of action learning cycles, focusing on the overall continuous improvement and refinement of my study. Figure 9 shows outcomes derived from qualitative data sourced through a Slack Channel, these findings illustrated specific subtopics that require attention but also revealed recurring themes within a dataset. The inclusion of verbatim responses from

participants further contributed to the comprehensive nature of the study, offering an informed research process.

Thematic analysis of Slack conversations identified recurring themes and keywords, such as "Student Engagement," "Program Diversity," "Executive Leadership," "Programs," and "Events." Further on, thematic analysis of identified keywords classified themes such as "STEM Programs," "Community Engagement," and "Scholarship Opportunities are the key areas of interest. After analyzing the key terms further, thematic analysis of Google Trends results was utilized and discovered trends and patterns with "Online Learning," "Career Services," and "Community Partnerships," as search terms that are gaining increasing search interest. Thematic analysis, coupled with Google Trends analysis, provided a richer understanding of the keywords associated with enrollment strategies and their evolving search trends. The insights gained from the collaborative and iterative process inform strategic decisions and enhance the quantitative analysis approach.

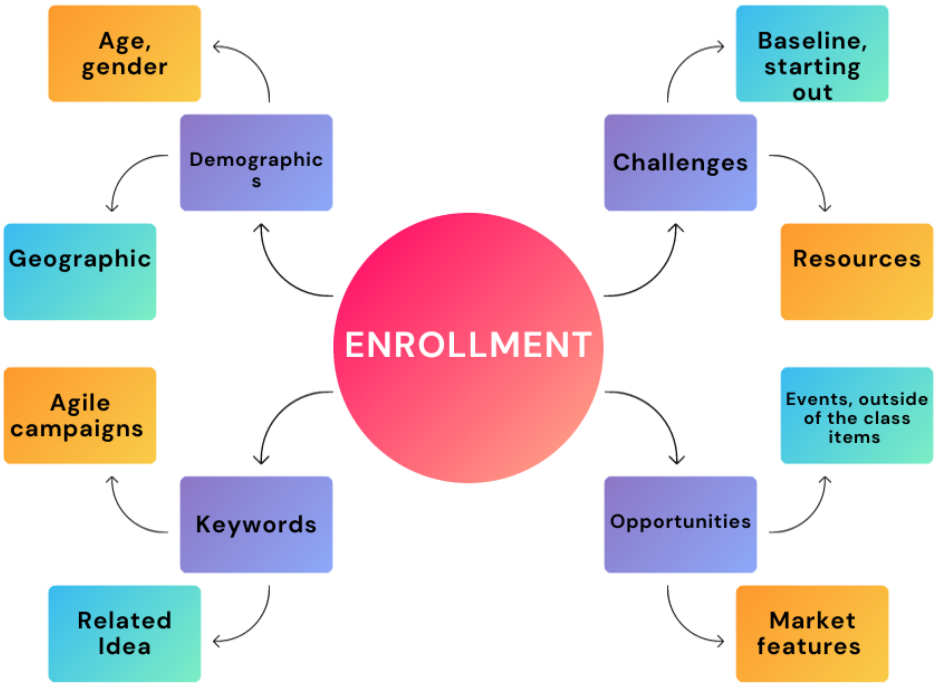

Figure 9: Slack Channel Themes
Source: Author

3.5.2.1 Transparency in qualitative data analysis

Transparency is fundamental because academic knowledge management relies on scholars sharing their data, theory, and methodology improving knowledge creation (Moravcsik, 2014). There are three main dimensions of research transparency: data transparency, analytic transparency, and production transparency (Moravcsik, 2014). In this research, transparency is embedded in various stages of the action research, particularly during observations. Clear documentation of action research cycles, including all of the participants involved, how they were recruited and the duration of the cycle, was implemented in this study. By clearly documenting the research cycles, the participants and other external stakeholders have a comprehensive understanding of the context behind the process. Clear communication with participants, allowed them to understand the various sources of data that were being utilized within the process. Collaborative keyword identification was done through cycles, with participants actively involved in the process of generating keywords based on reflections, discussions and thematic analysis. A thematic analysis process was used to analyze both Slack conversations and identified keywords, this included steps such as coding and theme identification, which makes the process more transparent.

3.5.2.2 Trustworthiness of qualitative data

Ensuring credibility, dependability, transferability, and trustworthiness during action research is one of the most critical steps to maintaining the integrity of your study (Shenton, 2004). To establish dependability, a researcher can repeat the work within the same context (Shenton, 2004). Achieving credibility in the study can be realized through prolonged engagement and persistent observation (Shenton, 2004), a concept that resonates strongly with the trends' dataset utilized, spanning years of trend analysis.

The incorporation of micro phases and expert groups, as recommended by Shenton (2004), contributes to a design that is more trustworthy and credible. This was exemplified in the action learning cycles, where participants were selected based on their expertise, and micro phases were employed to test and refine small portions of the outcomes, creating an iterative process of

improvement. This approach enhances the reliability and credibility of the overall design. Another crucial factor for ensuring trustworthiness, credibility, and reliability, as emphasized by Shenton (2004), involves testing with diverse groups of people and maintaining flexibility. During the study, participants were chosen from various roles to capture a diversity of perspectives. Simultaneously, the process demonstrated high agility, demanding a robust ability to adapt, progress, and iterate.

3.5.3 Data Collection Limitations

Although there are many advantages with the data collected for this research study, there are also many limitations and disadvantages. Google Trends is easily accessible, freely available, data is easy to be exported and use in comparative research (*FAQ about Google Trends Data - Trends Help*, 2022). Further on, Google Trends collects data across the globe, and since Google Search is the mostly used search engine, Google Trends tends to represent a great percentage of all people that have access to the internet (*FAQ about Google Trends Data - Trends Help*, 2022). However, when considering data collection from the website search trends, Google Trends does tend to come with some limitations. One of the key disadvantages is that Google Trends only provides relative numbers and it is hard to understand the absolute numbers. Hence, a comparative search needs to be done in order to get results that can be compared to each other. Some researchers tend to use Google AdWords in combination with Google Trends in order to recover the normalization constant which tends to be lost in trends data, and allows for a more concrete query popularity (Demir, et al., 2012). Google AdWords is a tool that is aimed at helping businesses with potential ads, however the main functionality used for this research is the keyword tool, which provides a user with search volume for a particular keyword (or search terms) in a specific region during a specific period of time (Demir, et al., 2012). Woloszko (2020) advises that it is important to consider adjusting the analysis for sales cycles, especially for B2B products or those industries with longer sales cycles, which addresses one of the limitations of this data in real-time and considers Google Trends as a long-term strategy.

Other limitations that I was faced with when collecting data for this study were challenges related to COVID-19. COVID-19 presented new constraints, such as limitations to in-person

interactions with my co-workers. Although challenges were clear, the limitations did present some opportunities as well, in particular, to learn and manage teams in a virtual environment. Furthermore, the flexibility of an online environment provided me with an opportunity to conduct additional action cycles and ensure that senior leaders who otherwise would not be able to participate in-person, were able to join virtually. However, one of the main limitations is the inability to utilize a white board and hold an in-person brainstorming session, during which an observation of body-language and facial expressions can be qualitatively analyzed.

3.5.3 Action Learning Sets

The formation of the ALS from the teams at The College of Business and The University of Akron were extremely important concepts to the success of my research. In short, big data collected through Google Trends is only as good and relevant as the brainstorming sessions through ALS, which form the foundation for data analysis of this project. One of the most important concepts utilized for group development is the use of reflective questions. According to Pedler (2011), action learning is the process of having individuals come together in real-time to resolve critical organizational problems through demanding action cycles. Equally important was the overall development of the action learning team that would consistently and continuously participate within the research.

In order to form the ALS, I looked for voluntary participants from the College of Business and across other areas of the University of Akron who had similar interests in improving enrollment. Initially, I made announcements in monthly college and faculty meetings, and virtual Slack University group (where various university stakeholders attended to resolve day-to-day issues and worked on some of the most strategic initiatives for the organization). These stakeholders resembled those who would be change agents within their respective departments. Initially, the information was presented in order to create enthusiasm surrounding my research topic. In particular, the most important aspect was my attendance to weekly meetings held by the College of Business leadership team. During these meetings, I was able to generate some interest from change agents within the College of Business, and this helped gather some voluntary participants who participated in ALS throughout my research. Forming ALS properly was central to the

success of maneuvering through the systems within the organization and the research associated with my organization (Björkman & Sundgren, 2005).

3.6 Methods

This section emphasizes the examination of data and insights derived from action learning sets. Employing both quantitative and qualitative data collection and analysis methods, the process unfolds iteratively, offering a comprehensive understanding of the subject matter. Ultimately, the analysis serves as a guide, illuminating the necessary actions to be undertaken.

3.6.1 Reflections from Action Learning Sets

The most important aspect from action learning sets were the reflections gathered. The first ALS included individuals across the University of Akron, a combination of leadership and staff, with all possessing diverse backgrounds and experiences, but they did all share a common interest and intention – to look for ideas within research that could provide insights enabling an improved decision making regarding improving enrollment. However, the second and the third set were focused on the leadership team and staff at the College of Business. The reflections obtained from the first set meetings were grouped into three areas of discussion: 1) an initial exploration of enrollment issues that were perceived as important by the University of Akron leadership team and staff; 2) an exploration of keywords to be researched; 3) possible areas for action. Further on, the second set meetings were focused only on the College of Business employees, in particular the leadership team and two of the main factors of discussion were quality of programs offered, current professional development activities offered and career opportunities. Finally, the last meetings focused on finding links between current enrollment characteristics and links to keywords analyzed and differences linked to demographics.

3.6.2 Coding & Data Analysis

I began my coding process immediately after each cycle of search queries collection and action cycles that provided input into the data selection for further analysis. I used Google Trends to analyze the search popularity of each key term that was selected, data was exported into an excel

document for further concept identification. Further on, Google Keyword planner was used in order to quantify volume of search queries. The data was also exported into Excel for further concept identification and to analyze the initial interpretation and the main ideas. Throughout this data analysis, I constantly looked at identifying demographic data for keywords terms, such as age, gender and location. Throughout the use of software such as StoryBase, I was able to use the analyzed keywords and identify demographics such as age, gender and location associated with each.

Moreover, the data that was selected was questioned before being applied for analysis. For instance, the key terms that were found to be of importance were identified through discussions with in ALS, some of the topics discussed in the brainstorming sessions were "*brainstorm terms prospective students may use to find the university*", "*gather information on the competition*", "*understand the strengths of programs offered*". I used a research journal in order to reflect my thoughts as a researcher and in order to be able to reflect on the brainstorming sessions. The use of research journal has been instrumental in literature as a way to reflect back on the ideas exchanged and capture observations throughout the ALS sessions (Corbin & Strauss, 2015).

3.7 Sense making of the data generated

Encountering confusing events or those that tend to be difficult to implement is a challenge within organizations, especially those that tend to operate in silos. In those situations, individuals should engage in sense making to answer questions such as those that relate to better identifying the story and next steps within the process (Weick et al., 2005). The purpose of sensemaking is to provide clarify and meaning to confusion scenarios (Weick et al., 2005). However, the process of sensemaking is widely not agreed upon, with many different interpretations and definitions (Brown et al., 2015). Throughout my thesis, sensemaking was important in order to create opportunity for listening, reflection and exploring the meaning behind everything, understanding different points of views and different stories. In order to accomplish this, one of the main tasks for me was to constantly share what I am learning, and to include change agents within the data collection process. Sharing results during leadership meetings and action learning sets, and amplifying the voices of change agents was the key to learning. Learning to listen was another

part of sensemaking which was incorporated within my thesis, listening sessions made use of collective sense-making to understand any trending themes.

3.8 Trustworthiness & Credibility of the Research

Assessing quality of measures taken into consideration ensures that the research is transparent and credible and that an appropriate method was chosen for the analysis. To ensure that the data collected was not influenced, it was important to gather keywords needed for analysis through ALS questions, which were open-minded and used as a brainstorming session. The participants were asked about their specific units and strengths of their programs/departments, while not being interrupted in order to assess every unit of the organization. Trustworthiness of research was achieved through the process of identifying the research design, utilizing an action learning methodology and the quantitative data collected which ensured that research questions were in respective to research objectives and related to the overall organizational objectives.

In order to assess the reliability of Google Trends data, I collected relative search volume of specific queries in a fixed period, downloaded on different days in order to reveal any dependencies that might exist on the date they were collected (Rovetta, 2021). The reliability of Google Trends data is further determined due to the fact that the value provided is a relative measure. According to Google, the values are calculated by determining each data point which is then divided by the total searches of the geography and time range that it represents to compare relative popularity (Rovetta, 2021). Moreover, places with the highest volume of searches would be ranked the highest (Rovetta, 2021). Afterwards, the numbers are scaled on a range of 0-100 based on a topic's proportion to all searches on all of the topics (Rovetta, 2021).

Further on, I ensured credibility through the objective epistemology and positivism because I pursued collection of scientific data that is precise and based on measurement and is often analyzed using statistics with the intention that the findings are generalizable. In other words, the focus of my research was authentic, focused on a workplace situation, and transparent to those involved within my organization. Furthermore, ALS sessions were focused on providing a process for all participants to cross-reference for credibility. Finally, although the data collection

and research process happened during the time of pandemic, the sample is representative of a population, and consumer behavior has been changing throughout the last two years, so it is unlikely alternative explanations that could provide other perspectives.

3.9 Research Ethics

Throughout the writing of this dissertation, my research was conducted openly and transparently during all of the stages of the process. Data used varied from online search history, to enrollment data collected by the university, while also being transparent and verified through ALS. As an example, I asked my workplace organization, in particular Vice President and Chief of Staff for permission to receive access to enrollment data for the last five years. Furthermore, identifying the research objective and the study was only possible through communication and brainstorming sessions with change agents throughout my organization. In particular this meant, that identifying information about research objectives and the study was presented at all stages, such as accepting and recruiting participants for the ALS, selecting keywords to analyze, and conversations with other stakeholders who are third parties within my research process.

The most important thing to note is that my ALS participants were voluntary members, and ALS were used to collect quantitative data through Google Trends and evaluate enrollment data at the University of Akron. It was important for me to utilize ALS as sessions in which data through Google Trends was collected, as it allowed change agents to see immediate results, and further develop keywords that should be utilized in my research. I was interested in receiving feedback from individuals who wanted to make a difference and truly cared about the topic, and had insights that they could provide to benefit my research. Furthermore, participants were not necessarily interviewed, the sessions were brainstorming sessions, in which data collection happened through Google Trends, so their participation was voluntary and they could withdraw at any point in time.

3.10 Chapter Summary

Chapter three was focused on outlining the overall methodology and research design that was taken in order to collect and analyze the data in my thesis. The chapter started with sharing my

research philosophical approach, discussion surrounding my ontological and epistemological position, the action research methodology taken and finally a discussion surrounding the research design. Throughout this chapter, I also discussed the reasoning behind the chosen research methodology. Furthermore, discussion surrounding data collection process was an important aspect of this chapter. I concluded this chapter with trustworthiness, credibility and the ethical research approach taken with this research. Chapter four focuses on telling the story through action cycles, my thoughts and reflection, what I did and what happened throughout the process, and what I found throughout my research journey.

4 Action Cycles

4.1 Introduction

The primary purpose of the action research intervention into the University of Akron was to develop segments of students based on their online search behavior, improving the marketing efforts and enrollment to the university. I used action learning as a way to inform potential change agents of my initiatives and gathered voluntary participants from the university to participate in the process. I used weekly College of Business leadership meetings and weekly Directors meetings to present my ideas and inform of my intentions with the research, and that was also a way to gather voluntary participants, who also could act as change agents as they are in leadership positions. College of Business leadership meetings included five department chairs, six full professors, a Dean, an Associate Dean and an Assistant Dean. Directors meetings included 11 directors of centers and institutes across the University of Akron campus. The initial actions taken from the collaborations with these two groups was presented early in this chapter in order to outline what was presented to the ALS. The primary function for ALS cycles are presented as reflections to support each action cycle, with a strong focus on search query data collection that took place during these ALS cycles.

Higher education is an industry that always seeks collaboration between practitioners and academics in order to improve its practices. In order to improve the knowledge creation across the organization and its competitiveness and sustainability across the industry, taking advantage of opportunities for individuals to collaborate with external stakeholders, those across other departments and those across other institutions, is an important task, and action research is highly integrated within that process (Gold et al., 2002). Action learning was one of the key ways in which I identified the right problem that I would be focusing on. Due to my past experiences which have shaped who I am as a person and which biases I tend to hold, I was using many causes as the problems, and not really getting the full picture of the situation until the use of action learning.

4.2 The Beginning of My Journey

I began my research journey by doing some exploratory trend analysis on Google Trends. I searched for branded keywords such as “The University of Akron,” “College of Business Akron” from 2018-2020 in order to begin my exploratory approach to try to understand what some of the associated keywords are that people that to search for. Further on, as I attended College of Business leadership meetings and Centers and Institutes Directors meetings on a weekly basis, I started to spend about five minutes during each meeting discussing my ideas and requesting voluntary participation in my study. My main goal was to gather some excitement surrounding the topic and get the support of these individuals, and hopefully some participation as well. Both groups of individuals were experienced and a great fit for my research needs, and could also highly benefit from the process.

My reasoning for starting with some initial exploratory trend analysis on Google Trends was to get an overall understanding of what that search trend looked like over a two-year period, and to be able to use that as a conversation started in ALS cycles. The data I collected informed my thinking and allowed me to think of some critical concepts before even further forming the action learning sets and developing any theories to initiate those action learning sets. It truly was an exploratory analysis into the situation.

4.2 Initial findings

The findings from my initial analysis in Google Trends helped me identify a couple of trends 1) “The University of Akron” search term is quite popular, gathering an average of around ten thousand searches per month, with a fairly inconsistent search trend, a lot of peaks often, but a lot of times with barely any searches as well (Figure 10) 2) “College of Business Akron” search term fairly inconsistent search trend, a lot of peaks often, but a lot of times with barely any searches as well (Figure 11), and one of the major peaks that happened in August of 2019 was directly correlated with the grand opening of a new professional development addition to the college of business.

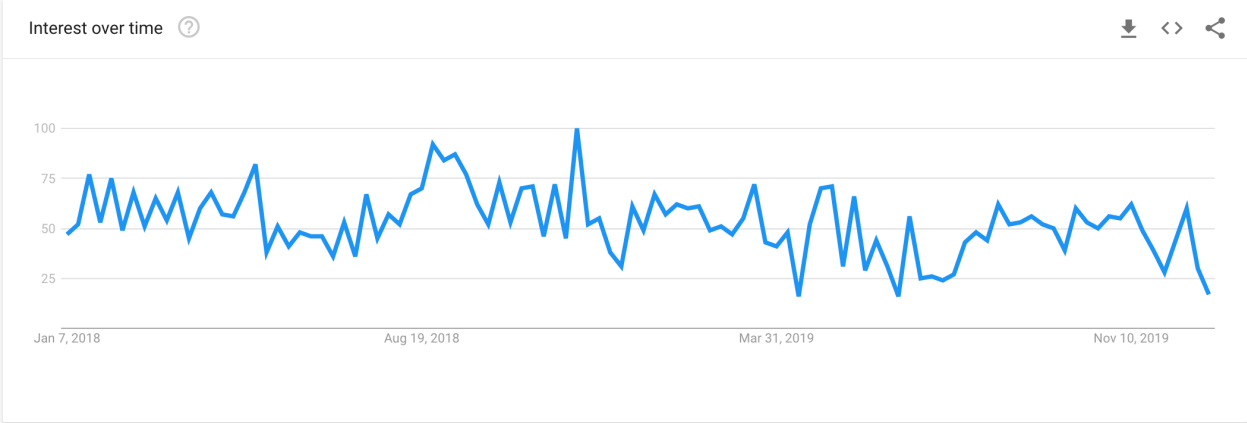

Figure 10: Interest over time for search term "The University of Akron"

Figure 11: Interest over time for search term "College of Business"

4.3 Forming the Action Learning Sets

Action Learning Sets were formed based on a virtual research setting. It was important to me to be as flexible as possible for my participants as they all have demanding jobs, but I do see them all on a weekly basis in our additional weekly meetings, and felt that I could always follow up in person if need be. Forming the two ALS was very similar, as these individuals are all within my workplace environment and have fairly similar scheduled, and all communication was done via email, Microsoft Teams and Slack. The ALS participants were chosen based on their senior status and/or leadership position at the College of Business, and for the second set those that are Centers and Institutes Directors and tend to be across the University, representing multiple colleges. In the first set, six participants out of the leadership team were the most consistent and consciences members of the action learning sets. During the action cycles, five participants out

of the Centers and Institutes directors were the most active members, with additional two dropping out after the first meeting, one left the University and another received a different role at the University, they were not replaced by anyone else in the action learning set. The representation in the second set ranged from those that are within the College of Business, College of Arts and Sciences and College of Engineering.

The most important aspect of the ALS was to engage and critically evaluate the research question and the data collection process through Google Trends and the University of Akron Enrollment Data. The participants reflected on the data collection process, and were present while the data was being collected, meaning that they were part of the process that refined the data collection steps. It also means that the data collection process evolved during each action cycle and after each action cycle the process improved and data collected informed the next steps. Utilizing the insights from my initial findings in Google Trends, I was excited to share my research goals and start the action cycles with the two different learning sets. Throughout my writing I will refer to ALS-1 as the set that consisted of the leadership team within the College of Business, and ALS-2 as the one that consisted of the Centers and Institutes Directors across various colleges at the University of Akron. Throughout the cycles I used a journal to collect memos observations during ALS cycles, this helped me reflect on the data that was being collected, recognize assumptions within the data, and better help me understand my thinking process (Brannick & Coghlan, 2007).

Coughlan & Coghlan (2002) identify the action research cycle process as a flexible process that follows the overall guidelines of the diagram in Figure 12 can be adapted to the specific scenarios more closely. In the first action learning cycle the key step was identifying the problem that I wanted to address in this cycle, planning to address this problem, including specific goals and objectives, and determining the methods of data collection and strategies. Further on, the importance was in observing and collecting data and re-defining the problem. This step included reflecting on the outcomes of the current results and the status of the action learning cycle. The reflection involved analyzing the data and realizing which aspects worked and which didn't, gaining insights into the underlying dynamics. The evaluation part of the action learning cycle included determining the effectiveness of the identified problem, this step also provided insights

into the action item, which then led to the iterative process. Action research is an iterative process, which means that some of the outcomes from this cycle inform the next.

In the second action learning cycle, the process started with sharing some of the findings and results in the previous cycle. Sharing some of the findings from the Slack channel discussions that occurred. This created discussions and at this point, I focused on observing and collecting data. I focused on Google trends data, observations, group discussions, Slack channel discussions. Like the first action research cycle, assessing outcomes and then the overall iterative process assumes a critical role. In this action cycle, sharing data and the results occurred in multiple steps of the process, as it was extremely important to receive their feedback. This action cycle also had a stronger action item, which provided some results that we were able to evaluate and utilize the results for the iterative process. Ultimately, the last action learning cycle followed a comparable procedure, distinguished primarily by the specific context and purpose.

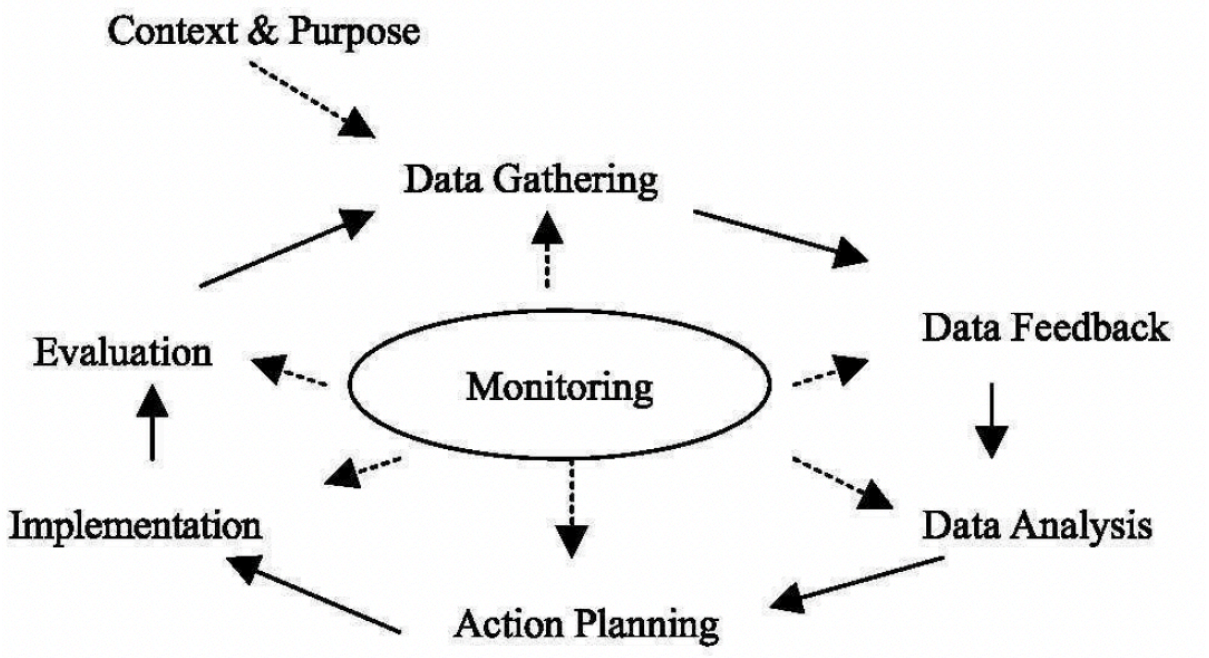

Figure 12 – Action Research Process
Coughlan & Coghlan (2002)

4.4 Action Cycle 1

The first action cycle was used to evaluate some of the concepts identified through the literature reviewed and to start looking into the data initially collected through Google Trends. Furthermore, the critical aspect of this first action cycle was to better define my research question and to expose participants further to this research topic. The first action cycle re-defined my research question and developed keywords for further analysis in Google Trends.

4.4.1 Re-defining my Research Question

Throughout my Doctoral studies, in order to evolve into a scholarly practitioner, I found it important to utilize the knowledge of those scholars who tend to think using visualizations in grounded theory, such as scholars Monk & Howard (1998) and Gold et al. (2002). As a visual learner, knowledge creation and effective learning happen through diagrams and visualizations. The two diagrams which have helped me are the rich picture and fishbone diagram, which we tend to refer to as diagram mapping processes. This process is in particular important during the early stages of research, in particular when dealing with exploratory investigation and trying to make sense of the problem statement (Bronte-Steward, 1999). Utilizing the rich picture diagram on a virtual whiteboard allowed me to understand how every other entity within the University is involved in the process of recruiting students. Furthermore, fishbone diagram, helped me identify the stakeholders, better understand the cause and effect relationship of my workplace problem, along with other problems that we are faced with. Although the process was informal and did not require any preparation on the participants' part, it was important for participants to do introductions and identify the following:

1. Their role in enrollment.
2. Their department initiatives to handle enrollment.
3. Their biggest challenges they face, related to enrollment.

Some of the key insights that were brought out by these findings were that my initial research topic of searching for the right forecast and focusing on forecasting student enrollment based on insights on search query, was not the right approach. The reason for that was that it is difficult to forecast when you don't even necessarily understand the segments of individuals, so re-defining

my topic to focus on segmentation was one of the key insights that came out of my initial action cycle.

4.4.2 Summary Reflections of the First Action Cycle

This first cycle revealed some additional themes that I should be considering when related to enrollment. Segmentation and understanding consumer behavior was something that was believed to be important. The theme of segmentation was an idea of mine, after participants revealed that they had some ideas about the basic segmentation, and as understanding the consumer behavior was one of the most important aspects into forecasting. I started to understand that I would not be ready to improve forecasting yet, but taking an initiative on shifting my research into understanding the online behavior of potential students was an important aspect to consider.

From an observation perspective, some confusion appeared when I discussed the use of online data for improving enrollment, but I also saw some hesitation as to not using that data as everyone deemed it important. Moreover, participants started to lose focus when discussion was surrounding forecasting, it was a tougher picture to understand, and everyone didn't necessarily understand how it can benefit them. During the time of the first data collection, the University of Akron was going through preparing for lay-offs, so some hesitation and emotional disconnect existed in our conversations.

The plan for the first ALS cycle was to be one hour long, however as we started to run out of time, I did decide to share data surrounding the search term "The University of Akron" and "College of Business Akron" on Slack that everyone can review and provide feedback on what they find interesting, and what questions they might have. At this point, I understood that I did not manage this first cycle as well as I would have liked, as we ran out of time due to some discussions surrounding the upcoming lay-offs. I also asked every participant to consider how others might search for their program/department online. I decided that the next cycle should happen within two weeks, as that will give people enough time to reflect on the re-defined research question and try to better understand and investigate the strengths of their department.

4.4.3 Action taken as part of the First Action Cycle

As part of the first action cycle, two critical items emerged, which required further attention and exploration. The first action item involved further exploration and literature review into segmentation, with the goal of enhancing understanding and application of the concept in various scenarios. The second action item required an in-depth exploration of variables that could serve as the foundation for student segmentation. Participants engaged in Slack channel conversations where they were prompted to reflect on demographic variables they associated with students. This provided me with some valuable insights from key stakeholders. The Associated Dean at the College of Business emphasized the challenge of effective segmentation without the inclusion of gender and age, which pointed out the need for additional demographic data to be associated with the keyword analysis. Similarly, a Director of one of the Centers discussed that some of their most successful programs were tailored towards women and non-traditional students, the latter often linked with age. This feedback emphasized the importance of considering data, such as age and gender, to be associated with the identified keywords, steering the focus towards a more nuanced and comprehensive segmentation approach.

In addition to the above-mentioned action items, a key focus transpired on evaluating tools that could enhance the processing of analyzed keywords and facilitate a deeper understanding of the demographics associated with them. Recognizing that there is a need for a more robust solution, the exploration led to the identification of StoryBase as a new and emerging tool, with promising results. The decision to integrate StoryBase into the overall process intended to leverage the capabilities of the tool providing valuable insights into the relationships between keywords and demographic variables. This was a strategic approach that marked an essential step in the first action cycle, laying the groundwork for a more sophisticated and data-driven approach to segmentation.

4.5 Action Cycle 2

The second action cycle focused on a discussion of keywords that might be relevant to a potential student and a hands-on approach to collecting data, as we utilized those keywords

during the cycle in order to review data immediately. The ALS members were provided with Figure 13 which discusses a typical process someone would go through to search for specific information online. Everyone within the sets felt more comfortable working towards the discussion of segmentation rather than forecasting. Through brainstorming sessions with employees within the College of Business and the University of Akron, I was able to identify keywords used for analysis in relation to recruiting and acquiring new students from both the graduate and undergraduate perspectives. As a result of this concept, I was able to improve my understanding of the keywords that are used across various entities of campus, but also utilize critical thinking in order to find innovative ways to improve the identification of new keywords.

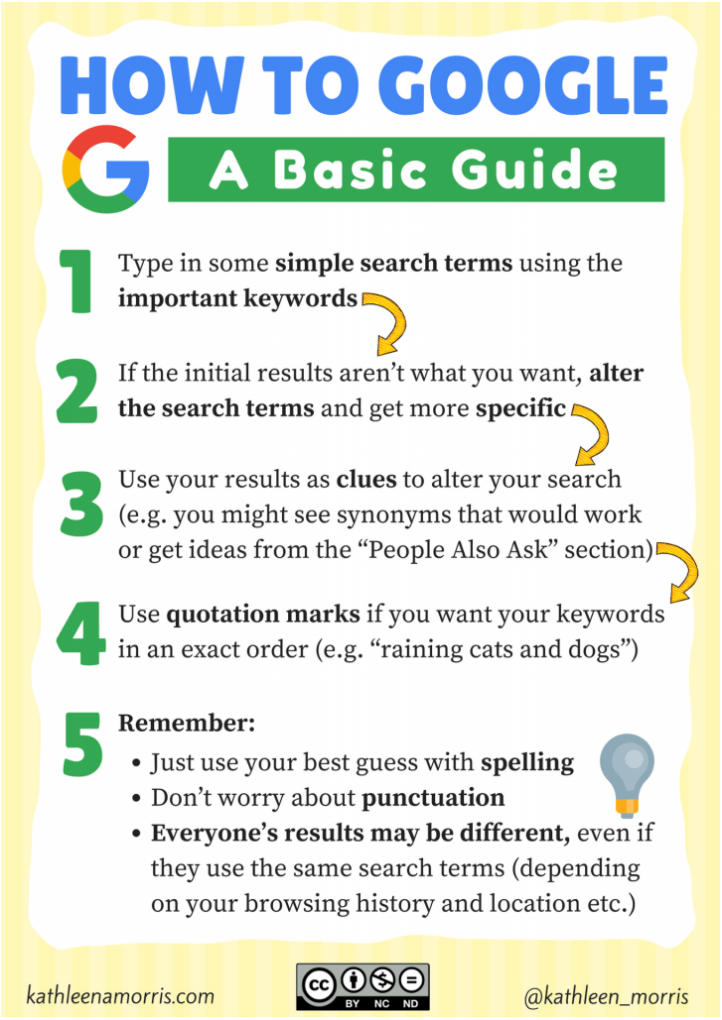

Figure 13: Basic guide to Google Searches
Source: kathleenmorris.com

The critical focus of the second action cycle was to generate keywords and data associated with those keywords. Furthermore, it was important for us to discuss the data collected during the cycles, and then further for everyone to go back to their jobs and reflect on the discussions and utilize Slack channel to share their thoughts and challenges. The data discussed during the ALS cycles was combined, as the discussions were as equally important, and the only difference was the identification of keywords, one was more general to other areas of the university rather than just focused on the College of Business.

4.5.1 Keyword Analysis

This section presents empirical research findings gathered through ALS Cycle 2 which lasted 3 hours each. The cycle started out with reflections on the keywords presented in ASL Cycle 1 and discussions based on Slack conversations, and from there on the members were informed that I received secondary data collected for this research from the Institutional Research, which is University of Akron enrollment data and we would be focused on collecting search trends data through Google in our ASL cycles. Throughout the two sessions we identified forty-eight keywords that were analyzed over a two-year period.

4.5.1.2 Slack Insights

Throughout the data analysis and feedback during our Slack virtual discussions between the first cycle and the second cycle, the following section focuses in identifying the keywords that will be used for further consideration. Google Trend search data related to university enrollment is determined based on related search terms that appear after exploring the data regarding the strengths of the University of Akron. The following keywords were chosen for further analysis: 1) colleges in Ohio; 2) universities in Ohio; 3) The University of Akron 4) Best universities in Ohio; 5) state colleges in Ohio; 6) Public universities in Ohio; 7) MBA program; 8) biomedical engineering; 9) mechanical engineering; 10) electrical engineering; 11) The University of Akron President; 12) The University of Akron closing; 13) The University of Akron layoffs; 14) The University of Akron Administration. The keywords were chosen as a combination of those programs/colleges that are the strengths of the University and those keywords that the University spends part of the marketing budget on to optimize for. Google Trends search index data and

enrollment data are both downloaded from January 2014 – present in the State of Ohio. However, for final analysis only data from 2018-2020 was used, mainly because there were some outdated trends that we did not necessarily want to analyze nor did we find it of value.

4.5.2 ASL Cycle Keyword Analysis

Analysis regarding search terms was done through the use Google Keyword Planner and mind mapping sessions with two sets of major stakeholders: leadership team at the College of Business and Directors of Centers and Institutes across the University of Akron. The key stakeholders were chosen based on their ability to act as change agents within their respective units. According to Caldwell (2003), change agents are transformational leaders who are charismatic heroes associated with risk-taking, dealing well with uncertainty, openness to new ideas and can act as change champions. It is also important to note that as a change agent, a manager facilitates rather than directs or manages, which increases the innovation and the stream of ideas from all of those involved. This was an important step for me to consider when choosing the keywords to analyze, because a tool such as Google Keyword Planner can only get me to a certain point, but in order to actually be innovative and creative, I had to utilize other people's ideas as well. Google Keyword Planner is used to find interesting keywords or key terms that are typed into Google's search engine by consumers and can help advertisers optimize their marketing efforts (Zink et al., 2018). Google Keyword Planner does also provide the estimated monthly search volume for the various keywords (Zink et al., 2018).

D'Antoni et al. (2010) define mind mapping as multi-sensory tools that facilitate critical thinking and help retain information. Through the use of mind mapping, I was able to take the initial step of seeking constant feedback from the critical stakeholders on the keywords to use. It was also important in these sessions to bring in the initial data provided by Google Keyword Planner. Google Keyword Planner provided insights into the categories mostly used when searching for an educational institution. The six categories in which majority of the keywords fall into are brand or non-brand, institution, field, program, industry and courses. Through the identification of these, we were able to hold mind mapping sessions which helped us develop the final keywords, shown in Table 5.

Keywords

Mba	part time mba	mba online
mba degree	top online mba programs	master's degree in business
online mba	masters in business	masters in marketing
business school	best mba	akron mba
best business schools	m7 mba	university of akron
online mba programs	top mba	Akron
top mba programs	executive mba programs	u akron
top business schools	top mba schools	akron law school
mba program	mba cost	akron zips
executive mba	best mba schools	akron university
best mba programs	mba degree online	best colleges in ohio
mba finance	mba school	akron ohio
best online mba programs	mba accounting	akron u
reddit mba	online mba cost	college in akron
mba marketing	business schools near me	akron masters
best online mba	business school online	colleges in ohio

Table 5: Search Query for the University of Akron
Source: author

4.5.3 Reflection of Action Cycle 2

As I finished with cycle two, I wished that I could go back to cycle one and re-do everything from the beginning, but I also realized that this is the growth process I had to undergo. Although there were two learning sets, I felt that the ideas behind them were fairly consistent and complementary towards each other. I felt that it was important to combine these two, as my findings from ALS 1 was profoundly more specific to the college that I am in, and the discussions surrounding other keywords were very broad to the overall University. Participants in ALS 2, Directors of Centers and Institutes, did find it also important to focus our discussion on the College of Business as much as possible, as that allowed us to potentially test various segments within the college and then use the best practices to implement on a wider scale.

Throughout this cycle, I also felt like I learned a lot about the way I think and learn, and also my thinking and learning evolved. I found it important to consider other points of views, but also

learned that brainstorming sessions should be more focused than what I initially came in with. We spent more time than we potentially should have, because I came in with no focus and really couldn't find solution to a problem, but my focus wasn't too specific. This was in particular shown throughout ASL 2, it would have been more productive if my focus immediately would have been identified, but it took almost half of the session to figure that out. I also believe that from a time perspective, it was too long, I ended up losing some participants earlier, while others stayed, as it was not as productive at that point. This learning helped me better prepare for ASL 3 and provide some concrete analysis regarding data collection for segmentation.

4.5.4 Action taken as part of the Second Action Cycle

During the second action cycle, some of the common themes were present regarding the need to not expand my analysis immediately across the university but to test out small pieces at the College of Business and utilize best practices learned by the rest of the university. Specifically, one of the directors mentioned, "The College of Business has demonstrated in previous instances that experimenting with a small campaign to assess its success can serve as a model for others to follow." Another Associate Director from a separate institute concurred, stating, "I agree; there's no need to expend funds and resources on testing numerous initiatives when we can use the College of Business as a test bed. Let's see what works here and use those best practices to take to other areas of the university." Furthermore, across the Slack channel, a predominant sense of uncertainty was evident, with a consistent theme of challenges centering around sentiments such as not knowing where to begin, desiring a baseline, and facing hurdles posed by uncertainty and a shortage of resources.

Following the second action cycle, and initial Slack channel conversations, I took a concrete step forward by creating a small-scale campaign within the College of Business. The action item was to test out a small sample of selected keywords and extract valuable insights that could help with future goals. The central point of this agile approach was the application of keywords associated with the online MBA program, as a way to test out a small campaign. Utilizing Google AdWords, the campaign featured keywords such as part-time MBA, top online MBA program, and online MBA. The primary purpose was to track the audience attracted by these keywords,

but also to assess the overall effectiveness of the campaign. An immediate observation was the underestimated budget allocation, in particular, due to the chosen keywords being more expensive than anticipated, demanding a higher budget allocation. Another observation was the significance of narrowing down the campaign's focus to a specific geographic region for optimal results. The initial experiment did not yield positive results to the enrollment, but it did provide valuable data to inform future strategies.

4.6 Action Cycle 3

This section will focus on providing insights to the findings and the analysis of the data collected through Google Trends and Google Keyword Planner. The findings form the basis for the creation of a suggestive clusters and improve segmentation of prospective students. Sales and operations planning managers traditionally tend to rely on historical sales data to forecast demand and segment students, however as disruption in technology continues to happen and changes in consumer behavior continue to be on the rise, it is important to consider things other than the historical aspect. In addition, unpredictable events such as the COVID-19 outbreak remind us that pandemics and other rarely occurring catastrophes do happen, and will continue to happen in the future (Donthu & Gustagsson, 2020). In fact, Stöhr & Esveld (2004) argue that the discussion should not be around whether an outbreak will happen, but when it will happen.

More specifically, this section is focused on providing insights into the process, learning and data analysis obtained during Action Cycle 3. This cycle deepened the data collection and analysis of the selected search terms that were developed during the previous cycles. After Action Cycle 2, I collected some preliminary data and utilized enrollment data for the past three years, which contains data such as the number of enrolled per program. The combined aggregated and analyzed data informed this cycle and the draft of my analysis.

4.6.1 Segmentation

Liu et al., (2018) describe market segmentation as a strategy that is used to divide a large market into segments of consumers with different needs, characteristics or behavior which might require a separate marketing strategy. Market segmentation depends on the availability of relevant data (Liu et al., 2018). When you segment your consumers, you know who to target, whether it is

based on their demographic, psychographic, behavioral or demographic characteristics. It makes marketing efforts more effective, appealing and personal. Clustering is the process of using technology and algorithms to analyze data and create segments based on that analysis (Min et al., 2018). Amongst the various clustering techniques, one of the most common ones which can handle large datasets is k-means clustering technique, which is a centroid-based algorithm that tries to separate the data in groups, and each cluster is distinct from each other cluster (Kumar & Reddy, 2017).

Using Tableau software, data from Google Trends and university enrollment was imported and the number of clusters to use was chosen. Google Trends data included a popularity rank per each keyword in each state. In this study, Calinski-Harbasz criterion to assess cluster quality was used. The criterion is inspired by the F statistic used in the analysis of variance and is further defined as follows:

$$\frac{SS_B}{SS_W} \times \frac{(N-k)}{(k-1)}$$

In this formula SS_B is the overall between-cluster variance, SS_W is the overall within-cluster variance, k is the number of clusters and N is the number of observations (Calinski & Harabasz, 1974). Hence, the greater the value of the ratio, the more cohesive the clusters and the more unique the individual clusters. Calinski-Harbasz criterion is well suited for this project because the individual clusters are very distinct and separate. In addition, Hassani & Seidl (2016) argue that Calinski-Harbasz has the best performance in k-means-based streaming environments, it is powerful and it also correctly penalizes some of the most common errors associated with clustering.

4.6.1.1 Cluster Analysis

The information utilized in this analysis was gathered from Google Trends, undergone cleaning and preparation (as illustrated in sample data Table 6), and is later imported into Tableau for further analysis. Integration with the University of Akron Enrollment data (Demonstrated in

Table 7) was also performed in Tableau, with state being the key field connecting the two datasets.

Region	Akron	akron law school	akron masters	akron mba	akron ohio	akron state	akron u	akron university	akron zips
Alabama	1	0	0	0	1	4	0	1	5
Alaska	0	0	0	0	0	0	0	0	0
Arizona	1	0	0	0	1	0	0	1	3
Arkansas	1	0	0	0	1	0	0	0	0
California	0	0	0	0	0	1	0	0	1
Colorado	1	0	0	0	1	3	0	1	2
Connecticut	1	0	0	0	1	0	0	0	0
Delaware	1	0	0	0	1	0	0	0	0
District of Columbia	1	0	0	0	1	0	0	2	2
Florida	1	0	0	0	1	2	0	1	4
Georgia	1	0	0	0	1	3	0	1	3
Hawaii	0	0	0	0	1	0	0	0	0
Idaho	0	0	0	0	1	0	0	0	4
Illinois	1	0	0	0	1	3	0	2	6

Table 6 - Three-Year Analysis of Selected Keywords: Google Trends Data (Full Dataset in Appendix)
Source: Google Trends

Abbreviation	State	College Enrollment	Number of Students (Average over 3 years)
AL	Alabama	304000	9.34913606
AK	Alaska	25700	4.12461885
AZ	Arizona	582000	27.497459
AR	Arkansas	160000	10.44903442
CA	California	2710000	124
CO	Colorado	361000	39.59634096
CT	Connecticut	197000	63.2441557
DE	Delaware	60700	9.34913606
DC	Disctrict of Columbia	97800	13
FL	Florida	1070000	94
GA	Georgia	543000	66.54385078
HI	Hawaii	61900	8.2492377
ID	Idaho	123000	8.2492377
IL	Illinois	738000	234

Table 7 – Enrollment data
Source: The University of Akron Institutional Research (Full Dataset in Appendix)

After uploading the data into Tableau the process of clustering was initiated. Tableau employs the k-means algorithm for clustering, which includes partitioning data into a specified number of clusters with each cluster represented by a centroid (Tableau, 2022). The process starts with an initial specification of cluster centers and involves the overall iterative refinement, which then minimizes the distance between data points and cluster centers. Tableau allows its users to specify the number of clusters. According to McCullagh & Yang (2008), the ideal situation for estimating the number of clusters occurs when the observed points form clearly separated clusters. Therefore, in my analysis, I began my investigation with 2 clusters and adjusted the count based on the obtained results.

With three clusters selected, the states were clustered in relation to the measures chosen (popularity ranking of each specific keyword per each state). As shown in Table 6, one state did not fall in any cluster and has been marked as not clustered. From the results, we can infer that Cluster 1 had the highest interest in searching for "Business Schools Near Me" (Table 6). Coincidentally enough, this was also a cluster in which majority of states such as California, Texas, New York and Florida, have the highest enrollment of college students (Figure 14). This was also a cluster that showed importance in online education. Hence, keywords such as best online MBA, business schools online and online MBA costs were quite popular in this cluster.

Clusters	Number of Items	business schools near me	best online MBA
Cluster 1	5	80.4	69
Cluster 2	32	0	27.56
Cluster 3	13	0	49.308
Not Clustered	1		

Table 8: Sample of Keywords and Clusters Described

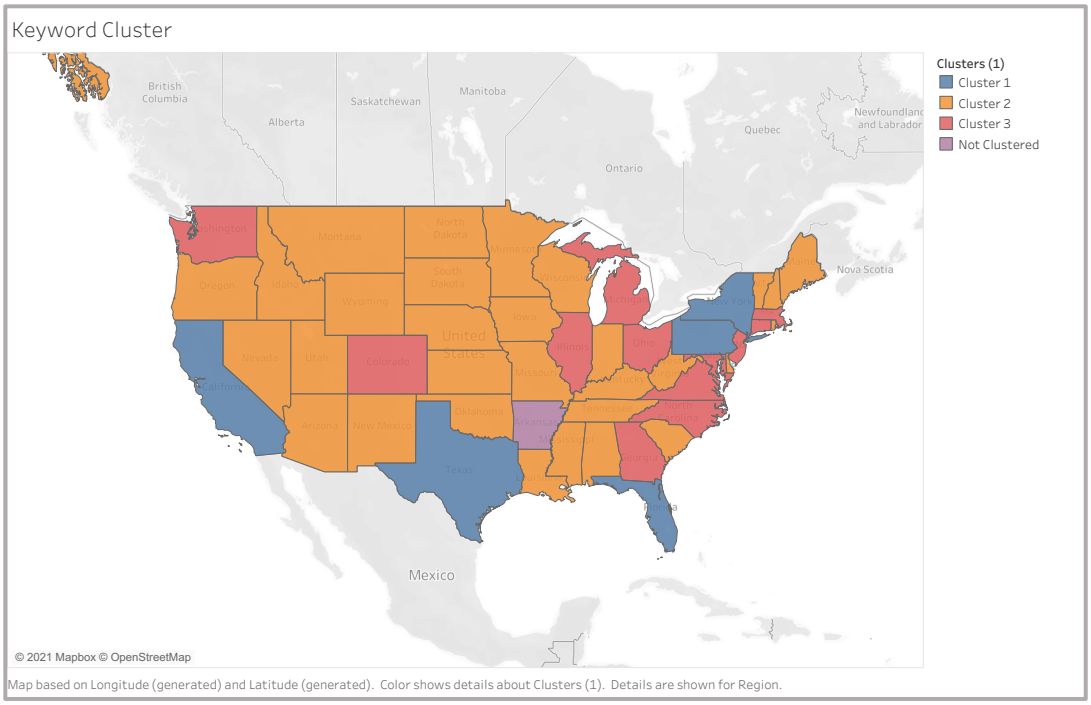

Figure 14: Clusters per State
Source: Author

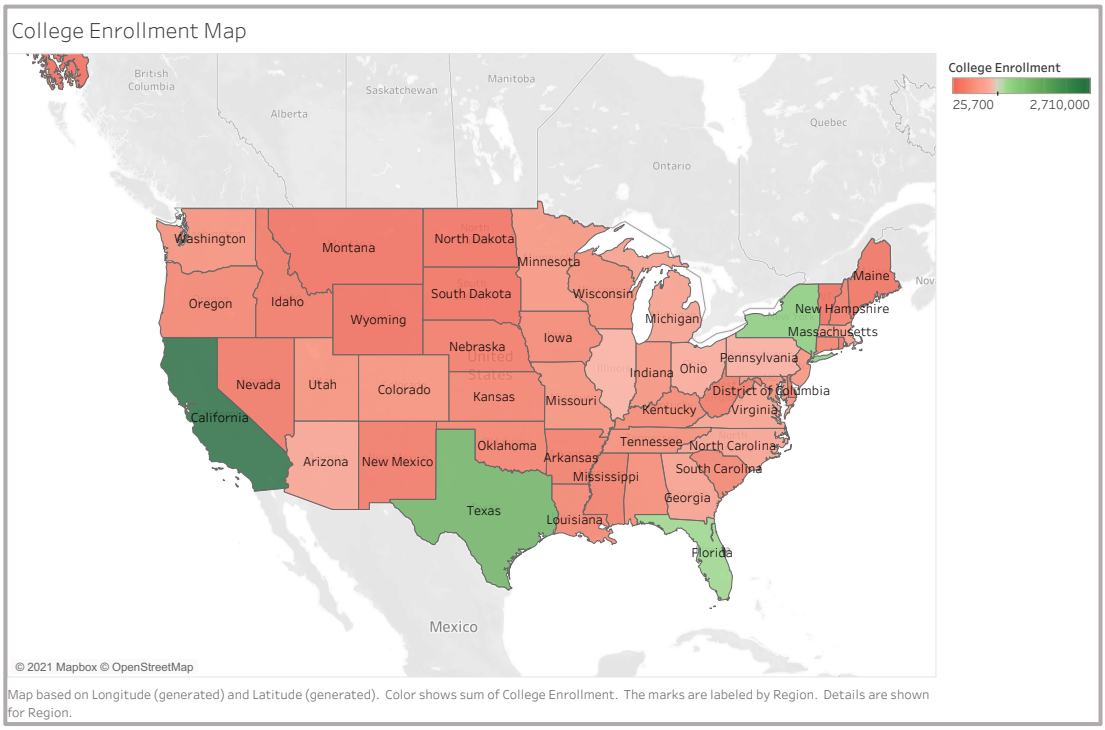

Figure 15: Total College Enrollment in Each State
Source: Author

From the results, we can infer that in Cluster 2 there was no or barely any interest in Akron branded keywords. Even though some states in the cluster like West Virginia, Kentucky and Indiana are close to the university, it really made no sense to do any efforts regarding branded keywords. However, this was the cluster that did provide some interest in non-branded types of search terms such as business school and MBA. And finally, from the results, we can infer that in Cluster 3, non-branded and programs-related search terms are of the highest interest.

4.6.1.2 Action taken

In the initial phase of the third action cycle, the crucial aspect was to augment the existing data. The initial findings lacked depth, and meaningful recommendations depended on a more profound understanding of the competitive landscape and the volume of relevant searches. The absence of this data poses challenges as it is difficult to determine the viability of investing in specific search terms. Therefore, the action item required at this step was to find a solution capable of providing the needed data. To tackle this issue, I turned to Google Keyword Planner, recognizing its potential and ability to yield strong results. The results from this action provided the data available and allowed the research to develop further recommendations.

4.6.1.3 Cluster 1 Recommendations

To best understand the types of keywords that should actually be utilized under each of these clusters in respect to what the University of Akron can compete against and afford, Google Keyword planner was utilized in order to establish the volume, level of competition and pricing for each keyword. From the results, we can infer that the University of Akron should focus its efforts on utilizing the keywords in Table 7 for Cluster 1 states.

Keyword	Avg. Monthly Searches	Competition
Best Business Schools	50,000	Low
Top MBA programs	50,000	Low

Top Business Schools	50,000	Low
Top MBA	5,000	Low

Table 9: Cluster 1 Recommendations
Source: Google Keyword Planner

These keywords were chosen due to the fact that they contain a decent amount of average monthly searches and the competition is low, hence the pricing would be more affordable for the University of Akron, but they would still be able to reach a large number of target audience.

4.6.1.4 Connecting Search Query Data to Demographics

A recurring theme came up consistently across multiple cycles and Slack channel discussion, focusing on demographics. During one of the Slack conversations, participants were asked about the programming they developed and how they chose which program to create. One professor said, “Beyond the classroom, my focus is on promoting diversity in programs." When asked about what students value most in the College, responses varied, with one mentioning "consistency" and another emphasizing, "It depends on who you ask." While further exploring the participants revealed that older individuals seek value-driven elements, while younger ones prioritize experiential aspects. An ongoing theme, emerging in earlier stages and persisting into the current discussions, involved gathering additional demographic data, particularly concerning gender and age.

As a result, an actionable step was taken to find a tool capable of amplifying the existing dataset with further demographic information. StoryBase emerged as a market leader within the field and was chosen as the tool to utilize. By inputting the key terms into StoryBase, the insights related to the demographics become available, as illustrated in Figure 16 and Figure 17. It’s worth noting that at the time of the analysis, there were some limitations to this data, as it lacks geographical segmentation, however, analyzing overall trends provides value insights for the framework analysis.

When connecting demographics to this audience, there are a couple of interesting observations made regarding the specific keywords. Search terms such as “Best Business Schools” and “Business Schools” have a comparable average monthly search, around 50,000, however, the

demographics are extremely different for those keywords. Figure 16 shows the demographics surrounding the key term “Best Business Schools” and Figure 17 shows demographics surrounding the key term “Business Schools”. This trend continues amongst all other keywords – search terms that utilize words such as “best” and “top” tend to be associated with men and keywords that leave out those “power” words tend to be associated with women. Men tend to search more for the “best” programs and look for attributes that show why specific university is the “best” at what they do. Yet women are looking for more flexibility and are looking at attributes that will provide them benefits other than just the perception of the “best” education.

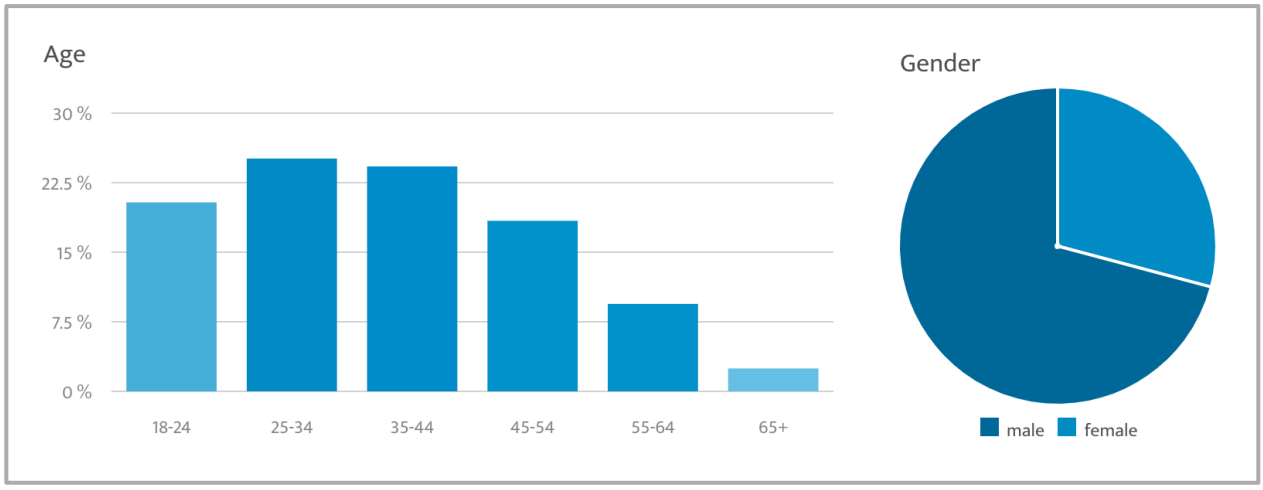

Figure 16: Demographics for keyword “Best Business Schools”
Source: Author

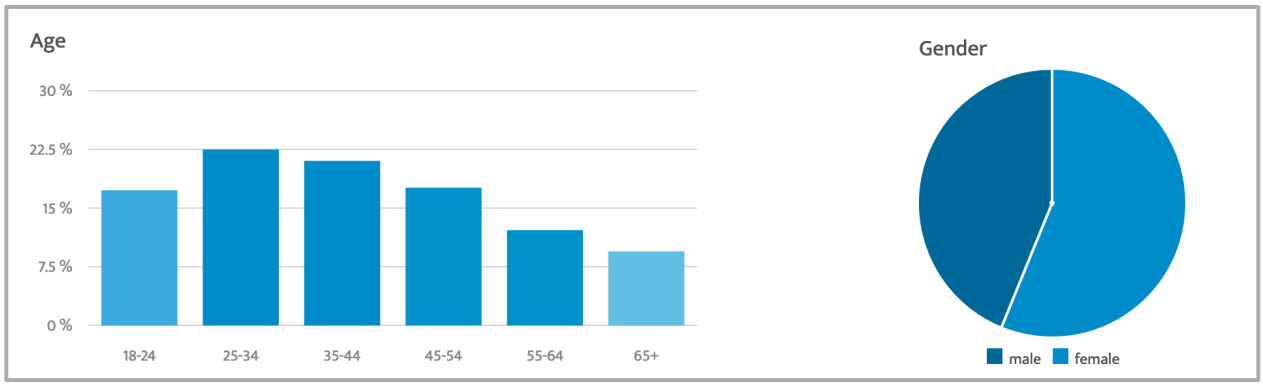

Figure 17: Demographics for keyword “Business Schools”
Source: Author

Hence, to further improve marketing efforts, I felt it was very important to revise the search terms recommended for Cluster 1. If we continue to focus only on the key terms that contain the words “best” and “top”, we will lack in diversity and only continue to market towards men, which goes against our diversity initiatives. The revised list of search phrases for Cluster 1 is shown in Table 8, along with average monthly searches and level of competition data that was derived from Google Trends.

Cluster	Keyword	Avg. Monthly Searches	Competition
1	Best Business Schools	50,000	Low
1	Business Schools	50,000	Medium
1	Online MBA costs	5,000	High

Table 10: Cluster 1 Recommendations (Revised)
Source: Author

Narrowing down to only the three search terms for Cluster 1 will allow us to put more investment into a search term such as “business schools,” which tends to be more competitive and costs more. The only critical states for the University of Akron out of Cluster 1 are Pennsylvania and New York (Figure 18 & 19), due to a higher enrollment of students at Akron from these states. When looking at the enrollment data, majority of the students that come from New York/Pennsylvania to Akron are undergraduate students, hence the recommendations surrounding the MBA search terms were taken out from this cluster in order to be able to invest money in a search term such as “business schools” which should help increase the reach of the University to more women. In addition to the two search terms, I did add “online MBA costs” as it is a search term that offers flexibility to women. MBA Today provides competitive analysis data on Ohio MBA programs. Through this research, The University of Akron offers an MBA program that costs less than any other competitive university, but still holds a high reputation having been ranked as one of the top MBA programs by CEO Magazine. According to CEO Magazine, the criteria used to determine this ranking goes beyond marketing brochures and

investigates the learning environment, class sizes, tuition fees, faculty, delivery methods, international diversity, gender parity and more (CEO Magazine, 2021). This is why I feel it is important to invest in a search term such as “online MBA costs” in all three clusters, as it allows the University to promote its lower costs and new initiatives for an Online MBA program.

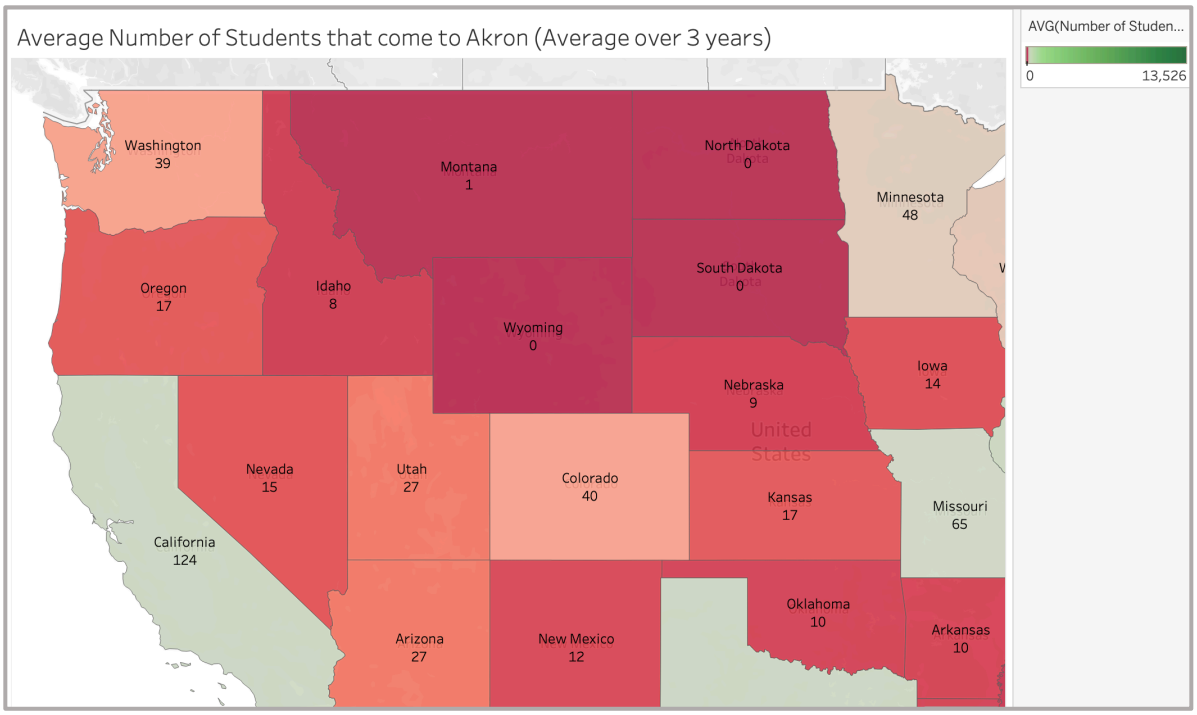

Figure 18: Average Number of Students that Come to Akron from each state
Source: Author
Data Source: The University of Akron Institutions Research Data

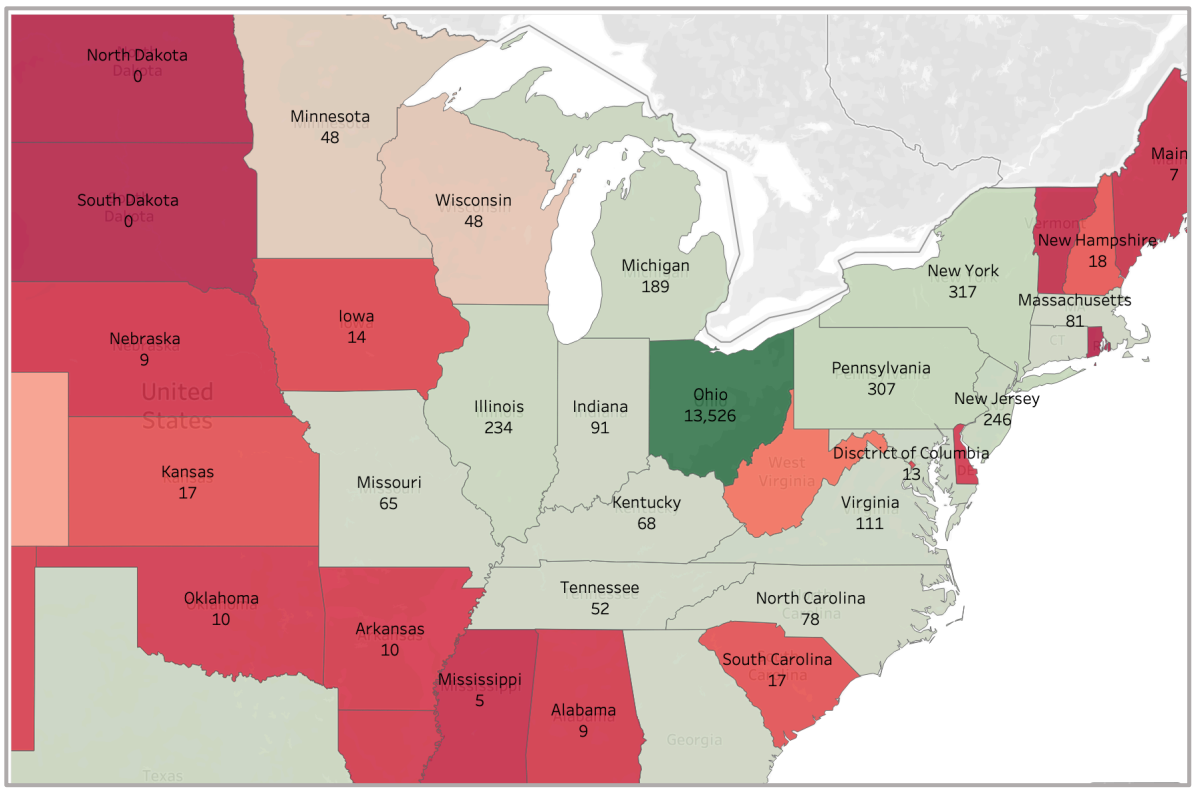

Figure 19: Average Number of Students that Come to Akron from each state
Source: Author
Data Sources: The University of Akron Institutions Research Dat

Cluster 2 Recommendations

The states in Cluster 2 don't field a large number of students to the University of Akron, however it is still important to consider how we can potentially increase this number, and by optimizing for the right search phrases can be the first step. As this cluster was very programs oriented, and did not field many students to the University of Akron, I felt it was important to prioritize the online programs offered from the college. As shown in Table 9, it was important to continue promoting the "Online MBA costs" with addition of other programs-oriented search terms such as "MBA Online," "Executive MBA Programs" and "MBA Programs." The demographics with these search phrases offers a similar insight, more men tend to search for Executive MBA Programs, while more women tend to search for MBA programs (Figures 18 & 19). As both of these search phrases have the same monthly average search volume of around 5,000, and both tend to be highly competitive, I think it is important to include it in this cluster, in order to continue to promote Executive MBA Program, but to also make sure the reach of the

university is balanced out and promoted towards women as well with the search phrases such as "MBA Programs." I think it also allows us to make sure we optimize our language in different online advertising efforts and promotions, in order to make sure that "MBA Programs" yields many other benefits that the university offers other than just the "executive" portion. Hence, it is extremely important to identify the benefits of the programs offered and continue to advertise with the right keywords.

Cluster	Keyword	Avg. Monthly Searches	Competition
2	Online MBA costs	5,000	High
2	MBA Online	5,000	Medium
2	Executive MBA programs	5,000	High
2	MBA programs	5,000	High

Table 11: Cluster 2 Recommendation
Source: Author

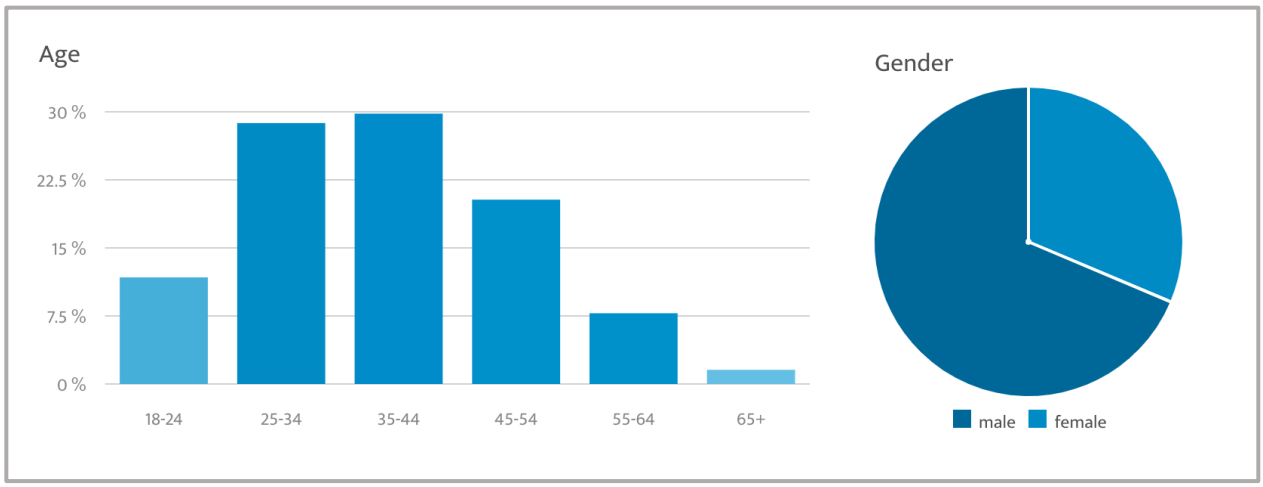

Figure 9: Demographics for keyword "Executive MBA Programs"
Source: Author

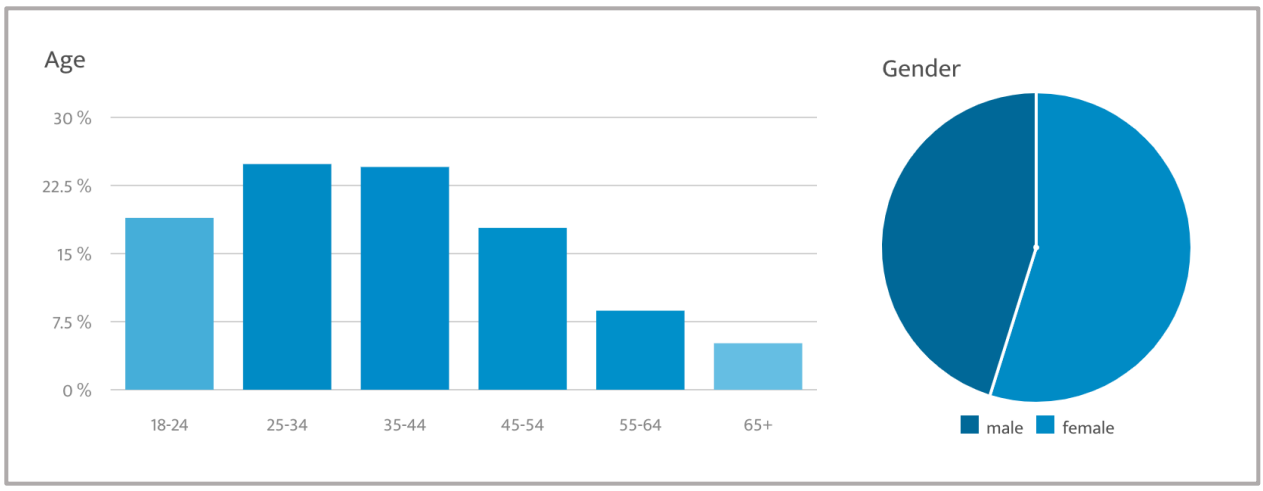

Figure 10: Demographics for keyword "MBA Programs"
Source: Author

Cluster 3 Recommendations

Finally, Cluster 3 was extremely important, as states such as Michigan, Ohio, Illinois and New Jersey, field many students to the University of Akron. This is the reason why my recommendation is to focus on search phrases that are in both Cluster 1 and 2, but also add a number of branded key search terms in Cluster 3. Adding keywords such as Akron MBA, University of Akron and Akron Masters offers the university the opportunity to provide important content and advertisements that put the brand name of the university in front of an important audience (Table 10). In addition, as this cluster contains a lot of neighboring states that tend to field many students to universities across the state, the addition of College in Ohio and Best Colleges in Ohio allows the university to compete for presence with keywords that have high reach, and low costs.

Cluster	Keyword	Avg. Monthly Searches	Competition
3	Best Business Schools	50,000	Low
3	Business Schools	50,000	Medium
3	Online MBA costs	5,000	High

3	MBA Online	5,000	Medium
3	Executive MBA programs	5,000	High
3	MBA programs	5,000	High
3	Akron MBA	50	Medium
3	University of Akron	N/A	Low
3	Akron Masters	N/A	Low
3	Colleges in Ohio	100,000	Low
3	Best Colleges in Ohio	10,000	Low

Table 12: Cluster 3 Recommendation
Source: Author

4.6.2 Reflections of Action Cycle 3

In summary, Table 11 provides the summary of all of the recommendations for each cluster. Based on the analysis, we can break down the prospective students based on their online search behavior and geo location. It is evident that there are opportunities to optimize our marketing efforts on specific keywords based on the home location. It is also quite important to consider demographics associated with these keywords, as they tend to provide a better direction on what type of content should be associated with those search phrases. Men tend to look for content proving that the University and/or its programs are top or the best, while women are searching for benefits beyond being the best. But most importantly, it also provides an opportunity for the university to further improve their diversity efforts. Understanding which search phrases will provide a higher reach to men vs. women, allows us to make sure that we are balancing out our marketing efforts, and continuously increasing our reach to diverse groups of potential students.

Cluster	**Keyword**	**Avg. Monthly Searches**	**Competition**
1, 3	Best Business Schools	50,000	Low
1, 3	Business Schools	50,000	Medium

1, 2, 3	Online MBA costs	5,000	High
2, 3	MBA Online	5,000	Medium
2, 3	Executive MBA programs	5,000	High
2, 3	MBA programs	5,000	High
3	Akron MBA	50	Medium
3	University of Akron	N/A	Low
3	Akron Masters	N/A	Low
3	Colleges in Ohio	100,000	Low
3	Best Colleges in Ohio	10,000	Low

Table 13: Summary of Clusters (Recommendations)
Source: Author

4.6.3 Action taken as part of the Third Action Cycle

Following the third action cycle, an important decision was made regarding the target audience for certain programs within the college. Throughout the third action learning set, a college leader highlighted, "Our education is on par with others, but what distinguishes the student experience are initiatives such as Women in Leadership and Girls Who Code." In the Slack channel, participants highlighted the significance of executive leadership, professional development, and events when discussing valuable opportunities for students. This pointed towards an action item of utilizing one of the groups, Girls Who Code, Women Who Code as a test campaign. This group was identified as requiring a narrower approach, with a defined geographic area and age range. Primary results revealed that the version without specific demographic parameters gathered a higher number of impressions, however a lower click-through rate. The version with specified demographics gathered a lower number of impressions but had a much higher click-through rate. At this point, the conversion rate was deferred for future analysis, as it requires a more comprehensive evaluation in the later stages of the campaign.

A discussion question was posed in a Slack channel to participants regarding the handling of keywords linked to a particular gender. For example, it was concluded that men tend to search more for “Executive MBA,” “Best MBA” compared to women. Through the discussion the

suggestions were posed to put an emphasis on highlighting the features of an executive MBA, to appeal to more women rather than solely relying on the programs name. This led to the identification of an item: the development of differentiation points for the graduate program, which were not previously utilized in marketing messaging.

4.7 Chapter Summary

Chapter four was focused on introducing the overall concept behind the use of action research in my thesis and the process behind data collection. The chapter presented findings from ALS cycles and the process behind preparing and developing each cycle. Action cycle one was focused on helping me identify my research problem in more depth, while also serving as the preliminary cycle that provided many insights into the overall process of running action cycles. Action cycle two was an aspect that helped me identify the data to use for analysis, throughout this action cycle I learned a lot about various ways in which the university can be best optimized for the digital environment. The third action cycle focused on providing findings and insights derived through data analysis and recommendations were formed. Throughout each of the action learning sets, there was a strong emphasis on the action items taken from each set and the results derived. The next chapter will focus on concluding the study and providing the overall insights into the reflections from my thesis.

5 Conclusions, Reflections & Implications

5.1 Introduction

Chapter five outlines the overall approach to my research, including the aims and objectives. To begin, I will discuss the limitations of my research and how these might support future research. Further on, I will outline how I feel I have contributed to the literature, the workplace environment, and overall to practice. I will also discuss the research implications which have had a profound impact on my approach. Finally, I will discuss my conclusions to the research and the reflective learning, and how as a scholar-practitioner I have evolved throughout my studies.

The overarching problem involves the continues nature of enrollment decline, raising questions about student decision-making and the need from a personalized marketing approach. The purpose of this study was to examine long-term patterns and gain a more comprehensive understanding of the demographics and geography linked to the data. To tackle this, an action research strategy was employed, utilizing Google Trends data.

5.2 Research impact

In contrast to other researchers in the field, my findings diverge by incorporating the internal perspective, specifically targeting employees within an organization. This unique approach involved a comprehensive examination of various campaigns, revealing instances where no significant insights were gained. Rather than persisting in a direction that was leading to no insights in the future, this setback prompted a strategic shift towards a more data-centric methodology. Unlike predecessors such as Choi & Varian (2012), who primarily utilized Google Trends for forecasting analysis utilizing only quantitative data collection methods, my research not only delivers rich qualitative feedback but also fosters personal development for both employees and myself as a researcher. While Choi & Varian (2012) successfully created a powerful forecasting model applicable to the automobile industry, my focus on a single institution fills a crucial gap in utilizing Google Trends for recruitment purposes. In contrast to the comprehensive analyses conducted by Hernik and Mingues (2021) and Rybiński & Wodecki (2022), which specifically focus on decisions within the higher education industry, my research takes a more narrow approach. It offers a detailed examination that extends beyond the higher

education sector, providing valuable framework for customer acquisition strategies across various industries.

5.3 Literature Gaps

From the perspective of reviewing existing literature, the body of work related to change management has enhanced my ability to effectively facilitate action learning cycles and promote organizational change. The theories proved invaluable in gaining a deeper understanding of the areas within my organization that required transformation. I theorize that my research contributes an additional dimension to the field of change management literature, presenting a framework that aids in evaluating and implementing action research cycles within organizations characterized by siloed structures and outdated perspectives, especially when dealing with new generations as customers.

In terms of search data literature, there exists a noticeable gap where no industry has leveraged this data type to create clusters and segment customers based on Google search data. I believe that my research can fill this void by offering a framework that extends beyond my specific industry, providing valuable insights for other sectors as well. Beyond the framework, I theorize that the incorporation of current customer data, particularly emphasizing the geographic aspect and integrating Google Trends data, represents a distinctive feature. The insights derived from this approach offer a segmentation of customers based on their geographical location, providing a nuanced understanding of the diverse factors influencing consumer behavior.

5.4 Practical Recommendations

Practitioners in data-driven decision-making should adopt a strategic and iterative approach to harnessing the power of Google online search data. Rather than expecting overnight progress, practitioners must cultivate a consistent practice tailored to the organization's unique data landscape. Furthermore, it is extremely important to involve employees at all levels in the process, encouraging their participation in data collection and analysis. This inclusive approach not only broadens perspectives but also fosters a sense of ownership and engagement.

Emphasizing the limitless potential of data, practitioners should think critically about the types of information they collect and explore innovative ways to integrate various data sources. One of the most pivotal recommendations is to embrace an agile methodology, conducting small tests and multiple sprints. This allows for the continuous evaluation and revision of strategies, ensuring adaptability to evolving circumstances. Lastly, practitioners should leverage Google Trends not just for trend analysis but also for segmentation and other analytical capabilities, expanding the scope and depth of insights derived from this valuable tool.

5.5 Limitations

Throughout my writing the key constraints are related to the time and lack of knowledge and training set out initially when collecting and analyzing the data. I utilized data collected through Google and enrollment data collected by the University of Akron. I used two action learning sets with different audiences, and three action cycles in order to select the right data, and analyze the most relevant data. I could have used the action learning sets with current students as the target audience in order to collect qualitative data, and also potentially even run some live advertisements with the keywords that I found of importance. I think those live advertisements would have helped to analyze my target audience even further. Furthermore, I ended up switching my direction through the writing of my dissertation as COVID-19 impacted the higher education industry in ways in which we never thought possible before. However, COVID-19 did emphasize the importance of my research as organizations mainly went into the online environment and consumers truly relied on the online environment for research and their everyday activities.

Early on in the research, I tried to address my own biases by keeping a journal every day and reviewing it on a daily basis to assess my own thinking and biases associated. Although this was important, the literature such as Coghlan and Brannick (2014), Revans (2011) and Pedler (2011) provided me with theory and an approach to my action research. Reflecting on my research design and methodology, I recommend expanding my approach further in future studies, focusing on collecting qualitative feedback and also self-reported feedback that helps us understand ways in which individuals themselves think. I believe that in combination with my

current data collection methods, this would allow me to provide a much stronger approach and analysis.

5.6 Further Research Areas

Further research should consider focusing on improving the forecasting model because the implications and implementation process is now improved with a better segmentation and understanding of the student body. From a practice perspective, my recommendation for future organizational research is to utilize action research for making organizational changes. In particular, I believe that data collection within further research needs to be enriched and should be the core focus of future research. I would in particular note an importance of utilizing self-reported surveys and focus groups after I completed my action cycles, and in fact added literature review sections on both to help me better understand these two topics and how they could be relevant to my research.

5.6.1 Online Focus Groups

The very next step in further research of this topic should begin from an exploratory perspective utilizing online focus groups. First, a background of focus groups was provided in section 2.7 of this thesis, and it discusses the role of focus groups in the research process.

Focus groups come before more targeted research because, as research becomes more targeted, the research methods are less open-ended; that is, they are less open to new constructs being introduced. For example, a survey may ask about many specific constructs and give little room to venture in other directions. Similarly, an A/B experiment may focus on just a few constructs. You may know the feeling of constructing a survey and questioning whether you are including the questions that need to be asked – this is a case where a focus group can provide the needed starting ingredients. Often, the most valuable output from focus groups is constructs that researchers did not anticipate. Hence, focus groups help increase the constructs that can be considered before proceeding to more targeted research. For more targeted research, the researchers will likely select a few constructs from focus groups that seem most important for further study.

As has been implied, the research process does not end with focus groups. This is because the relevance of the constructs to the focal object needs further testing. One reason is that some constructs identified from a focus group may not actually be that relevant to the focal object. For example, sometimes participants will make guesses about what is important to them that are actually of little importance to them. Using more targeted research, such as approaching a construct with a careful selection of items in a survey or triangulating analysis from different sources of data, can help test the validity of the relevance of such constructs.

Another reason that focus groups cannot be the last step of the research process is that it cannot be known whether the constructs actually represent the target population. In marketing research, a target population may be known as a market segment. The data directly from a focus group may only represent the specific participants of the focus group rather than the target population. To determine the extent that a construct represents a target population, more targeted research needs to be conducted that randomly samples a population and that uses a larger sample size than would be expected from a focus group. For this reason, it is often best practice to avoid reporting results from focus groups that imply representation of the target population, such a means and proportions.

5.6.1.1 Online Focus Groups in Further Research

Based on the above, in order to begin further research, I would like to utilize focus groups in order to evaluate the features of services provided by the University of Akron and gather opinions about its demand. From an exploratory perspective, this would allow me to also gather insights into any new features that might not be included currently. Because we do not want too much division within the focus group, which might stifle participation, focus groups are typically composed of homogeneous members. This might include only having members of the same market segment. For example, from my perspective future research should utilize prospective students and potentially a second focus group of only current students.

The recommended length of a focus group session is one to two hours. Experience has indicated that the responses to each open-ended question may last about 5 to 20 minutes, so plan for about 5 open-ended questions (5 x 20 minutes = 1 hour and 40 minutes). You may write some

additional questions in case you go through the five too quickly. Open-ended questions should progress in an inverted triangle form: broad to more specific, except for the last question (the closing question), which is broad again. Begin with an icebreaker. Although it is an icebreaker, making it a question relevant to the research question(s) so that it can be used in the analysis. The closing can be used to ask about new thoughts that have come up about previous questions because people may have continued to think about them.

5.6.1.2 Active Listening

Throughout literature review on focus groups, there was some discussion surrounding the topic of active listening, which made it really interesting to me for further research. Probing is the verbal (and possibly non-verbal) prompts the moderator provides to encourage further elaboration when a participant is discussing her or his response to a question. Receiving elaboration is critical to have enough detail, and unbiased detail, for qualitative analysis. One might be tempted to rely solely upon the five open-ended questions mentioned earlier and avoid probing the responses to them. In our experience, this has not provided a sufficient quantity of data; we've seen focus groups planned to go a couple hours last not more than 20 minutes because probing was not utilized. Further, the responses tended to be superficial, largely borrowing from what others in the room said or providing minimal depth into one's experiences. Hence, probing is essential.

For probing, this section will draw on the active listening technique, which is a technique used in counseling psychology that is designed to help the client open up. The essence of acting listening is that you are getting the participant to talk rather than yourself; hence, the "listening" of active listening. The "active" part comes in by using cues to prompt the participant to continue to elaborate; hence, active listening can satisfy the task of probing.

The "active" and "listening" parts go together because the goal is to draw from what you've heard the participant say to form the prompts you give. For example, if the participant describes an experience where a professor or a staff member made rude remarks, and you probe by saying, "to avoid the conflict, have you ever signed up for a certificate course." You're not applying active listening because you're not following up on what the participant is saying. If you think of

an important question unrelated to what the participant is saying, you might write it down and wait for the discussion on the current question to end. A more appropriate probe would follow up on the rude remarks because that is what the participant has been talking about. Hence, in order to practice active listening, you need to pay attention to what the participant is saying rather than paying attention to what you plan on saying once the participant pauses; this is counter to how we usually talk to people, so it takes so practice and effort simply to stop the mental planning and focus on what the participant is saying. Once you are actually listening to the participant, active-listening prompts are easy because the prompt simply uses what the participant has been saying.

5.6.2 Self-reported Surveys

One of the key aspects to consider will be that my survey is going to focus on a larger sample size and will be complementary to the research done in a focus group, except the focus will be a little bit more specific. However, there is no good design no good feedback unless the participants are willing to participate. In order to increase participation for this study a chance to win one of $25 gift cards should increase the chances of participation. A common value proposition for survey participants is that they may benefit from self-reflection. If the survey is assessing attitudes on products or services then explaining to participants that their feedback is important can make them feel valued. There is no doubt that participants are motivated to take a survey for more tangible reasons then reflection or helping, where gift cards and monetary incentives can certainly increase response rate, but may ultimately hurt the authenticity of response. Regardless, if you communicate that participation is exclusive, much like selling a product, people tend to turn out more. Ultimately, it is important to communicate benefits and establish trust with one's prospective survey audience. Perhaps most importantly, it will be important for me to make it known how the survey will be useful or make a difference with regards to the research topic.

In order to increase trust amongst participants, I will take a number of different steps, such as allowing participants to ask questions about the survey and reducing uncertainty can help mitigate skepticism. Any survey or experiment can benefit from sponsorship by a credible or legitimate authority, such as the University of Akron, thus it will be essentially important to

convey that where possible. Furthermore, participants should feel assured and comfortable knowing that their information will not be divulged in any way that leads to their identification; researchers must consider the difference between communicating an assurance of anonymity versus confidentiality. In my perspective communicating that the responses will be anonymous will be a strategy that I would take.

Literature discusses the importance of context surrounding the questions. Items that accurately tap into or measure the domain of interest are said to have content validity. For example, if the goal of my study is to measure individual attitudes towards College of Business MBA program during a school year then a survey item like "on a one to seven scale, please rate how much you like or dislike breakfast food" is likely not high in content validity, because a participant's liking of breakfast food as an item is not relevant to individual attitudes towards their workplace environment. An item with likely higher content validity might be "on a one to seven scale, please rate how much you favor or disfavor lowering the number of credits required to take." Because the number of credits policy is a relevant and popular topic that a participant will likely review and compare amongst schools.

Literature also discussed the importance of using open-ended or closed-ended questions (Diefendorff, 2020). Open-ended items are useful for asking questions where answers are unknown to the researcher or if there are too many possible answers to provide in a finite range of response options. A researcher might be trying to survey on a subject that may have many answers, such as popular movies. If a researcher were to ask respondents "what is the funniest comedy movie?" it would be unreasonable to only provide four, five, or even ten finite options to select from, because there are hundreds of comedy films that have been produced and having a hundred answer choices for one question could be extremely complicated and problematic. In this instance, it would be best to leave the question open-ended and allow the participant to customize the response for an accurate and exhaustive response range. In my instance, this is not going to be a strategy that I would undergo in the future studies regarding the topic of enrollment, I would like to consider open-ended items within the exploratory stage and in a focus group, and have a more concrete focus in a survey.

Close-ended questions on the other hand are more suitable when participant response options are likely to be limited in range and relatively known. For example, asking participants which of the programs they are interested in studying has no need for a customized, open-ended response, because, generally speaking, the range of answers is limited to about ten options, and everything beyond that can be grouped into a section called other.

5.6.2.1 Pilot testing

Pilot testing is often kept in mind and considered by researchers, but not used as much as it should be. In reality, a pilot test is an authentic practice run of your survey with a sample that will mirror participants you'll be seeking in the primary implementation of your questionnaire. This will be an extremely important step that I would like to consider in future research.

In terms of survey design and administration, these questions center around your survey items and the expected responses you intend to get based on underlying theory and assumptions driving your study. If you're administering two versions of the same survey, where one has a manipulation in terms of items or measures as related to others, then it is important to know if those intended differences manifest as expected prior to conducting your main survey. This step of the process also will not only allow me to understand if everything is working as I had intended for it to, but also whether or not the data collected will serve the purpose that I had hoped it would. Essentially a pilot test is extremely useful, because it ultimately prevents you from not only wasting your own time and resources, but potentially those of the primary sample you intend to test (Bausell, 1994). Furthermore, the pilot test can reveal whether the sample you intend on working with is problematic, thus outcomes of the pilot test may reveal necessary changes in who you administer your survey to or changes required of your survey. It's important to note that not every problem or issue is going to be solved regarding surveys through pilot testing, but it can help in the long term.

5.7 Research Implications

The data collected helped improve practices within my organization and get something accepted and changed within an organization in an iterative manner, which is difficult to do. Overall

exploratory data analysis helped provide insight into my workplace problem. Further on, ALS cycles helped improve the thinking that goes into data collection. The support of literature provided themes and actionable insights that could be utilized throughout my study. The overall process of data collection enriched my data collection and eventually the results.

5.8 Reflections

Through my initial inquiry learning what I wanted to achieve from my research and putting it in a usable perspective of identifying the most relevant research problem, was essential for the beginning of my analysis. It was important that I was immersed in the process of research and knew the kind of a role I play within my research, but also those associated with the research and concepts influencing it. Furthermore, I am now much better prepared for action learning cycles, as I have learned many lessons throughout. I also have a better understanding of how important it is to have as clear of a research proposal as possible, but to also be able to adapt as needed. Due to COVID-19, my approach needed to adapt, and being agile within project management and change management was an important insight.

One area that I initially was very concerned about was conducting action cycles online, due to COVID-19 restrictions, however I found that it allowed participants to be more flexible and it opened an opportunity for some to participate that otherwise they might not have. The online platforms that were used for action learning set cycles were platforms that everyone was already fairly familiar with as they were using them in their everyday jobs. The participants within the action learning sets were co-researchers, who acted as change agents and were tasked with spreading insights from research into their departments. The action research approach provided me with a much better understanding of data collection methods and understanding of data analysis than I thought originally it would. My analysis was enriched through the fact that everything was heavily influenced by conversations, providing some of the qualitative feedback that was missing.

I shared the findings with the participants of ALS, who then shared it amongst their departments. The most important implementation of the findings has happened within the College of Business marketing initiatives through the use of and ADKAR change management model. It was simple

enough to utilize and to have individuals from various roles understand. The College of Business tested out four different marketing campaigns based on the insights provided from my research, and initial results have showed an increase number of impressions and the number of applications. The number of impressions refers to the number of times an individual ad has been displayed on someone's screen. This number is important as it provides a better chance that someone will actually act on the ad, and complete the call-to-action. In order to implement a similar approach within other units of the University of Akron, a similar action learning approach will need to follow.

The most successful part of my research, is that although the findings were accepted and implemented, it also was written in as part of the process to follow within the College of Business marketing efforts. So, any future campaigns will have to consider the insights provided from my research, and should consider updating the data based on new consumer behavior trends. Fundamentally, organizational change is possible when the right problem is defined and when everyone involved collaborates and shares the same problem that impacts their everyday jobs.

The overall process of action research throughout this dissertation writing has opened my eyes and possibilities to a whole new spectrum. Even though I did not solve all of the problems I had an intention to at the very beginning of my dissertation writing, I do feel like my personal growth as a researcher has improved tremendously. In particular, the idea behind scientific theory in connection to a workplace problem has opened my eyes not only to various problems that I never even thought of in my organization, but it has also opened my mind to so many theories and concepts which I can use in the future work. Some of the problems that I ran into throughout my research would have never been established if it wasn't done through action research. I know that for a fact, as I have been stumbling upon the symptoms for over 4 or 5 years, and until I completely shifted my perspective to action research methodologies, I never established even parts of those problems. The theories and methodologies are all of the opportunities that I am faced with in the future. In particular the rich picture diagram, the fishbone diagram, positivism research paradigm, data collection and analysis – just to name a few.

Although these opportunities present a well-defined opportunity for me, there are still many barriers I am faced with. In particular, encouraging my organization to invest time and resources in action research is going to be a challenge. There are various tasks on a daily basis that need to be improved upon, and connecting action research to key performance indicators is a difficult task. However, I feel that the future sustainability depends on it. Hence, why I feel confident that if I as a manager start implementing various tasks utilizing action research, I can slowly start to implement changes within my organization. In general, I would say that the overall task of improving myself as a manager was far more important and effective throughout my doctoral dissertation. In particular, my shift from a practitioner to a researcher whose job is to bridge the gap between academia and practice will be very effective for my organization, but also for myself and my future career. I hope to utilize action research not necessarily just for my organization, but also to be at the forefront of knowledge creation. My goal is not only to contribute to my organization, but to invest in contributing to other organizations that are investigating for ways to improve, in a way that they can utilize my research and customize it to their own industries as it relates to improving their organizational structure or professional goals.

5.9 Conclusion

During the pandemic, many industries suffered, including higher education. However, online education and online executive education saw a major increase in demand (Donthu & Gustagsson, 2020). Those universities that had well implemented online education platforms and online marketing strategies were able to quickly capitalize on this trend. In particular, those universities that were able to utilize the right content and the online marketing efforts were positioned well to compete. However, in order to effectively do this, organizations should utilize Google Trends data for predictions and forecasting. The monitoring of online queries utilizing Google Trends can provide organizations insight into human behavior, as the field is continuously growing and will provide useful for continuous changes in consumer behavior (Mavragani et al., 2018). However, although this is really important to consider, the proper implementation and acceptance of insights such as this truly depend on action learning and an evolvement of an individual as a change agent.

Overall, my evolvement as a scholar-practitioner and change agent was one of the most important aspects from a personal development. Most importantly, I have learned a lot about what is required and what processes should be taken to influence and executive change. Overall, my recommendation deals with identifying the right problem through collaborative efforts of other stakeholders, gain early approval and involvement of other stakeholders, frame the literature review in the most effective way to understand many aspects associated with the problem, design the methodology, gain trust and collaboration with participants who act as co-researchers, share findings iteratively throughout the process, plan implementation on a smaller scale so that we test out the concepts and can then apply on a larger scale, and finally learn from the overall process. Fundamentally, I never involved collaborators in identifying the right problem, which is one of the key insights I have gathered from my research. Involving collaborators early on is essential to the success. But also, pilot testing small pieces before full implementation allows for any corrections to be made very early on.

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Appendix A

Letter of Authorization from The University of Akron

Office of Academic Affairs
Akron, OH 44325-4703

February 3, 2020

Ethics Committee
University of Liverpool
Liverpool L69 3BX, United Kingdom

Dear Committee:

I am writing to confirm that Mrs. Vanja Djuric will have access to all relevant data from The University of Akron Institutional Research website located at https://www.uakron.edu/ir/enrollment-data.dot to conduct the analysis involving her dissertation projected entitled, "Searching for a better forecast: segmentation of student body through the use of online search data to improve forecasts of university enrollment."

If you have any questions, please do not hesitate to contact me.

Sincerely,

Rex D. Ramsier
Exec. VP/Chief Administrative Officer

Appendix B

Letter of Support from the College of Business

Office of the Dean
College of Business Administration

Akron, OH 44325-4805
t: 330-972-7041
f: 330-972-6588

www.uakron.edu/cba

January 29, 2020

Ethics Committee
University of Liverpool
Liverpool L69 3BX, United Kingdom

Dear Committee:

I am writing to confirm that Mrs. Vanja Djuric will have access to all relevant data from The University of Akron to conduct the analysis involving her dissertation projected entitled, "Searching for a better forecast: segmentation of student body through the use of online search data to improve forecasts of university enrollment."

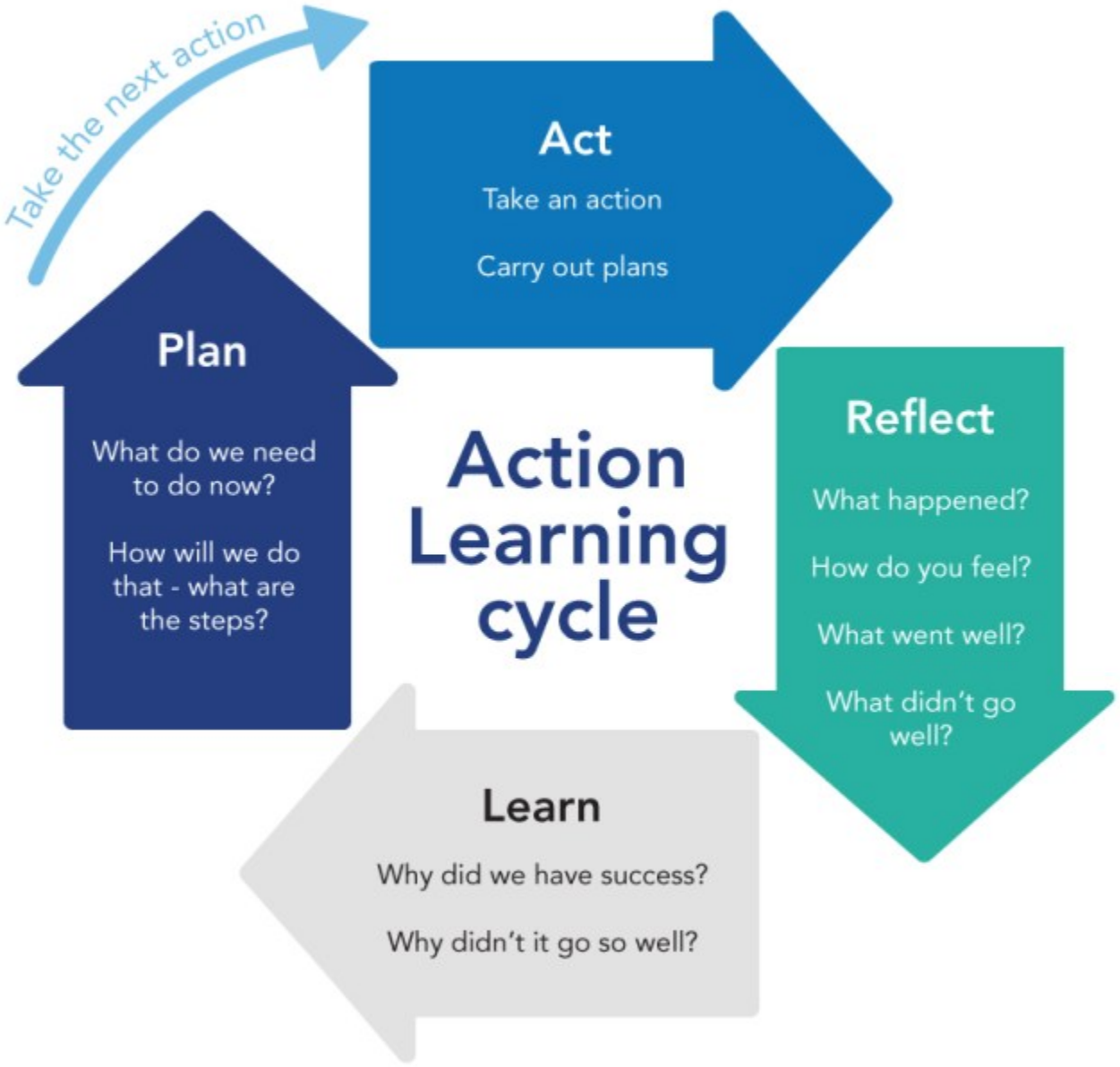
If you have any questions, please do not hesitate to contact me at +1.330.972.8304 or Terry.Daugherty@UAkron.edu.

Sincerely

Terry Daugherty, Ph.D.
Associate Dean

Appendix C

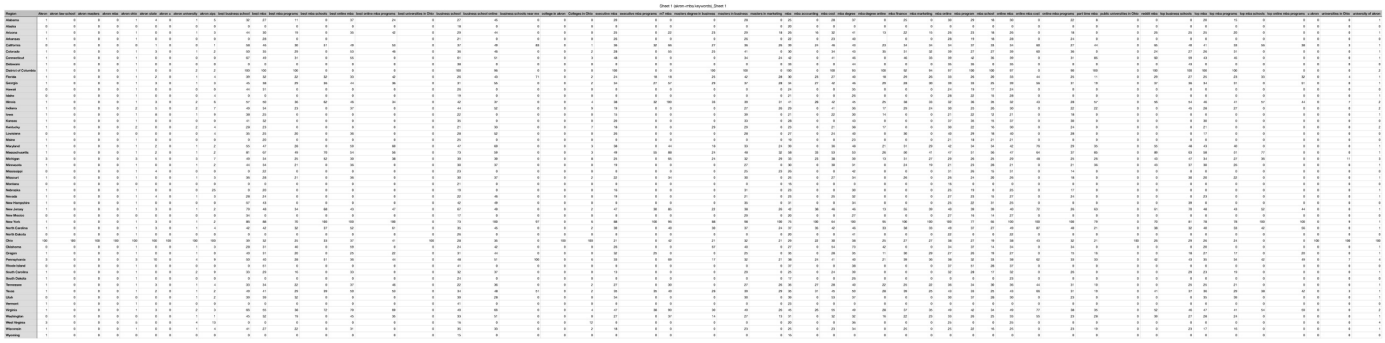
The Framework Used in Action Learning Cycle



Source: *The Action Learning Cycle* adapted by Taylor et al. (1997)

Appendix D

Data used for analysis



Sheet 1 (akron+mba keywords)_College Student Data

Abbreviation	State	College Enrollment	Number of Students (Average over 3 years)
AL	Alabama	304000	9.34913606
AK	Alaska	25700	4.12461885
AZ	Arizona	582000	27.497459
AR	Arkansas	160000	10.44903442
CA	California	2710000	124
CO	Colorado	361000	39.59634096
CT	Connecticut	197000	63.2441557
DE	Delaware	60700	9.34913606
DC	Disctrict of Columbia	97800	13
FL	Florida	1070000	94
GA	Georgia	543000	66.54385078
HI	Hawaii	61900	8.2492377
ID	Idaho	123000	8.2492377
IL	Illinois	738000	234
IN	Indiana	388000	90.7416147
IA	Iowa	254000	14.29867868
KS	Kansas	213000	17.32339917
KY	Kentucky	263000	68.19369832
LA	Louisiana	241000	9.62411065
ME	Maine	71800	6.87436475
MD	Maryland	361000	130.33795566
MA	Massachusetts	500000	80.84252946
MI	Michigan	541000	189.45749251
MN	Minnesota	409000	48.39552784
MS	Mississippi	169000	5.22451721
MO	Missouri	374000	64.61902865
MT	Montana	49400	1
NE	Nebraska	135000	8.52421229
NV	Nevada	118000	15.39857704
NH	New Hampshire	161000	18.14832294
NJ	New Jersey	414000	245.55230887