

**The Development of Disruptive Innovators in
Business/Marketing Education**

by

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Abstract

Employers recognize innovation as a crucial trait in employees (Mumtaz & Parahoo, 2019). Innovative individuals are those who actively contemplate positive changes for the organization, share their ideas, communicate the company's vision, and inspire others. Research has led to the identification of five discovery skills of a disruptive innovator: associating, questioning, observing, networking, and experimenting. Disruptive innovators are people who want to change the status quo, take smart risks, and refuse to live by others predetermined agendas (Dyer et al., 2011).

This research study was designed to investigate whether disruptive innovators are being prepared in middle/junior high, secondary, and postsecondary Business/Marketing Education classrooms. Analyses were conducted to determine the perceived level of Business/Marketing teacher's discovery skills, extent of teachers integrating discovery skill teaching strategies in the classroom, correlation between the level of a Business/Marketing teacher's perceived discovery skills and the extent to which the teacher integrates discovery skill teaching strategies in the classroom, and differences among Business/Marketing teachers perceived discovery skills level considering their demographics (highest degree, teacher certification, race/ethnicity, number of years teaching, type of school, state of employment, and gender). Of 583 surveys emailed to Southern Business Education Association members, 100 Business/Marketing teachers completed the study, which was a return rate of 17.2%.

Data results were analyzed using the Statistical Package for the Social Sciences (SPSS) version 28 using the following statistical procedures: Descriptives, Pearson correlation, and one-way ANOVA. The highest number of participants held a master's degree (52%) and (46%) of

participants indicated having a class A certification. The largest percentage of participants by race/ethnicity were identified as White or Caucasian (67%). Of the total number of participants, (35%) percent of the participants indicated having 11-15 years of teaching experience, and (60%) indicated having teaching experience or having experienced teaching in a secondary school setting. The majority of participants who completed the survey reported Alabama as their state of employment (31%). Most of the participants were female (64%).

Overall, the average mean score for discovery skills perception was ($M = 2.66, SD = .87$) suggesting that, on average, participants viewed themselves as rarely engaging in innovative thinking. This finding reflects a moderate to low and moderate high self-perception of innovative thinking. If teachers do not believe in themselves to teach the students discovery skills, the preparation for middle/junior high, secondary, and postsecondary students to become disruptive innovators will be delayed. The results indicated that Business/Marketing teachers integrated the discovery skill teaching strategies “sometimes”, on average ($M = 3.72, SD = .54$). Also, the results revealed that participants’ knowledge base plays a vital role in preparing students to be disruptors.

Artificial Intelligence (AI) Use Disclosure Statement

In the preparation of this thesis/dissertation, the following Artificial Intelligence (AI) tools were used: Grammarly. This tool was used primarily to correct punctuation and grammar errors. The author acknowledges full responsibility for the intellectual content of this work and has ensured that all AI-assisted sections have been reviewed and revised for accuracy and appropriate academic style. All AI-generated content was reviewed and validated for relevance, appropriateness, and accuracy before incorporation into the final document to maintain scholarly integrity of this research.

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CHAPTER 1

Nature of the Problem

Introduction and Background

Employers recognize innovation as a crucial trait in employees (Mumtaz & Parahoo, 2019). Innovative individuals are those who contemplate organizational change and convey their ideas, concurrently articulating the company's vision and motivating others. Research has led to the identification of five discovery skills of disruptive innovators: associating, questioning, observing, networking, and experimenting. Disruptive innovators are people who want to change the status quo, take smart risks, and refuse to live by others predetermined agendas (Dyer et al., 2011). Organizations want employees who can help the organization adapt to the changing trends of the market (Jones, 2019). Having employees who are diverse in their skills can lead to innovative organizations. Rae (2020) identified the top five companies for innovation in 2020 as Google, Amazon, Apple, Microsoft, and Samsung.

Google, as an illustration, fosters innovation among its employees by providing numerous outlets for expression, such as Google Café (for collaboration), Google Moderator (an innovation management tool enabling employees to vote on ideas), and Google+ Conversations (offering direct access to top leaders). Providing such engagement opportunities contributes to ongoing innovation and effective management practices (He, 2013).

Amazon works to empower innovation from every level by seeking new ways of doing things. Thinking about the future, employees can attend artistic classes and various other creative activities to foster creative thinking (Amazon Staff, 2019). The goal is to provide employees with an open space to express themselves which ignites a spark for innovation.

The constant adoption of change has made Apple the top among other companies because this approach enables the company to focus on consumers and their needs (Safian, 2018). The ability to do things before they are needed and perfect them overtime sets Apple apart from other organizations.

Employees who identify with their company are more likely to carry out the vision and mission of their organization. Microsoft company emphasizes the employee experience which in turn encourages employees to be innovative within the workplace (Microsoft Corporation, 2020). Providing workspaces for collaboration and digital engagement may provide opportunities that spark creativity and innovation. Practices such as these workspaces have identified Microsoft as a leader in global and artificial intelligence developments.

Samsung has created a space for innovation with its creative lab (c-lab) to allow employees to develop their own designs (Samsung Newsroom, 2016). The creation of new ideas does not necessarily have to fit the current business model of Samsung, but rather it must earn acceptance from colleagues. Innovators whose projects are chosen are supported in starting an independent business with seed funding provided by Samsung, creating a win-win situation for Samsung and its employees in terms of collaboration with start-ups created through the c-lab.

The more organizations provide opportunities for employees to be innovative, the further they increase workforce engagement. Disruptive innovators are people who want to change the status quo, take smart risks, and refuse to live by others predetermined agendas (Dyer et al., 2011). When it comes to the five discovery skills of disruptive innovators, associating is known as a cognitive skill which means connecting unrelated thoughts and bringing them together. An example of this skill is mathematics and welding, creating an ideal combo (Young, 2020). Math skills allow those in the welding profession to complete their projects, eliminating and correcting

mathematical errors as needed. Though associating generates a cognitive skill, the four behavioral skills are questioning, observing, networking, and experimenting provide the courage to change the status quo (Dyer et al., 2011). Questioning is when innovators ask thought-provoking questions to gain better insight for creativity (Gregersen, n.d.). School-aged children ask questions to gain a better understanding of why something is done and will continue until they are satisfied. Questioning leads to powerful inquiry solutions. The observing skill of innovators is to watch and see (Dyer et al., 2011). An example is how former Starbucks CEO Howard Schultz traveled somewhere different from his usual surroundings and discovered the art of coffee shops. This new discovery would later birth Starbucks brand in the United States. After observing, it is time to find individuals with diverse backgrounds by networking (Dyer et al., 2011). These innovators are called idea networkers. They are less concerned with boosting their egos and more concerned about how they can learn new ideas. Jet Blue and Azul Airlines founder wanted to provide a way to fill the back seats of airplanes. While attending a conference, he detected TV satellites and later bought the only company with live technology capability at that time (Dyer et al., 2011). Innovators seek new ways to see the reaction to a new idea. Experimenting looks at future outcomes and how to capitalize on these outcomes. Apple, for example, not only created computers, but also revolutionized hand-held devices, making them convenient for consumers.

Pannabecker (1995) noted that current trends of technology contextualize history in the way people teach, learn, and transmit technological knowledge. Research revealed that in order for students to be successful in a disruptive environment, which is constantly changing, they should embrace challenges, be intentional in solving problems, and create solutions society does not know it needs (Kaplan, 1998). Beginning in the 1980s and 1990s, there were rapid

technological advancements. This period has been identified as the Information Revolution which has been considered on the same scale as the Industrial Revolution (Collins & Halversion, 2018). The potential of the fifth industrial revolution has surfaced while the impact of the fourth industrial revolution is being evaluated. The fourth industrial revolution introduced automation processes that improve productivity for a better consumer experience (Schwab, 2016). According to Ustundag and Cevican (2018), industrial revolution 4.0 is the increase of transmission and information processing for mass production.

Even though industrial revolution 4.0 brought more of a digitalization concept, organizations are looking into the future with 5.0 and what it looks like (Atwell, 2017). The uncertainty will bring a lot of questions as to how it will disrupt the business processes. Therefore, barriers between people and virtual environments will be tested (Scanlon, 2018). The fifth industrial revolution will be surrounded by humans and machines that will return the focal point to the first industrial revolution—manufacturing (Shelzer, 2019). Businesses now must acknowledge that victory will come from innovative disruptors who respond to the marketplace needs. Business/Marketing teachers have the potential to assist in the development of disruptive innovators by finding a multitude of ways to engage students through differentiated instruction. These experiences can be both in the classroom and outside of the classroom with various kinds of stimuli that make the content interesting and exciting.

Statement of the Problem

Employers seek employees with innovative capabilities, particularly those who embody the skills of a disruptive innovator. Organizations desire individuals who can assist them in adapting to the evolving trends of the market (Jones, 2019). Employees who are diverse in their skills can lead innovative organizations. The field of Business/Marketing Education assists in

the development of technological skills for K-12 students which prepares them for workforce and postsecondary education (Alabama State Department of Education, 2019). More importantly, the Business/Marketing Education curriculum, developed by the Alabama State Department of Education, involves aligning the current standards with current and projected workforce trends. Federal requirements for college and career readiness indicate that nationally, schools have not adequately prepared students for high expectations in the real world. The state's course of study for Digital Literacy and Computer Science helps students become information-based citizens in a global society (Alabama State Department of Education, 2019). The Alabama Regional Workforce Council aims to align workforce and education resources according to workforce skills identified by business/industry (Alabama Department of Commerce, 2022). The aim is to develop a regional strategic plan that includes business/industry input that supports local economic development activities (Alabama Department of Commerce, 2022).

In a society that is continuously changing, the strategies teachers are currently using may not be adequately preparing students for careers yet-to-be discovered related to being a disruptor. Business/Marketing Education faces a continuous challenge to maintain curriculum standards that align with business and industry demands. As the need for innovative employees increases for the workforce, Business/Marketing teachers should be developing the students with skills to set them apart from their peers in an increasingly global economic society.

Currently, there is no research examining the five discovery skills of a disruptive innovator: associating, questioning, observing, networking, and experimenting, and whether or not they are being integrated in Business/Marketing classrooms (Gordon & Schultz, 2020). Therefore, the problem in this study examines the discovery skills of a disruptive innovator within Business/Marketing classrooms.

Purpose of the Study

The purpose of the study was to investigate whether disruptive innovators are being prepared in middle/junior high, secondary, and postsecondary Business/Marketing Education classrooms. This study investigated the following: (a) the perceived level of Business/Marketing teacher's discovery skills, (b) the extent that Business/Marketing teachers are integrating discovery skill teaching strategies in the classroom, (c) the correlation between the level of a Business/Marketing teachers perceived discovery skills and the extent to which Business/Marketing teacher are integrating discovery skill teaching strategies in the classroom, and (d) the differences among Business/Marketing teachers perceived discovery skills level and their demographics (highest degree, teacher certification, race/ethnicity, number of years teaching, type of school, state of employment, and gender).

The findings of the study will highlight areas that can guide professional development opportunities provided by the State Department of Education that encourage teachers to think independently, generate innovative mindsets, and integrate discovery skill teaching strategies within the Business/Marketing Education curriculum. These types of teaching strategies can assist in preparing students to be proficient in their future careers and globally compete in the workforce as a disruptive innovator.

Research Questions

The following research questions were used in this study:

1. What is the perceived level of Business/Marketing teachers' discovery skills?
2. To what extent are Business/Marketing teachers integrating discovery skills teaching strategies in the classroom?

3. Is there a correlation between the level of Business/Marketing teachers' perceived discovery skills and the extent to which Business/Marketing teachers are integrating discovery skill teaching strategies in the classroom?
4. Do differences exist between Business/Marketing teachers' perceived discovery skills based on the following demographics: (a) highest degree, (b) teacher certification, (c) race/ethnicity, (d) number of years teaching, (e) type of school, (f) state of employment, and (g) gender?

Theoretical Framework

The theoretical framework for the study focuses on widespread advances in technology or business models that disrupt or plan to alter industry practices in a way that obscures current work (Christensen et al., 2018). Considering the pre-internet era helps understand the context of present-day technologies (Mari, 2019). The disruptive and evolutionary effects of technology have caused changes in work routines and job responsibilities, leading to up-skilling, deskilling, and reskilling. Up-skilling is the professional learning approach that involves gaining new skills for the desired outcome (Cambridge Dictionary, 2019). Deskilling is the reduction of control by employees and the loss of knowledge during the labor process (Braverman, 1974), and reskilling is this professional learning approach involving learning new skills for a specific job duty (Farlex, Inc., 2011). The 20th-century digital revolution shifted the process of data and ushered in a new age of transformation services driven by technology (Wieringa, 2018). During the economic recession and political wars, disruptive innovation was desperately sought after within organizations. Economists argued that innovation was needed, and consumers were willing to pay for advanced technological solutions (Helbing, 2016).

Christensen (1997) reviewed organizations that lost the top market share in their respective industries. He discovered the lack of innovativeness in terms of commitment to sustain and disrupt innovation in business models. Christensen theorized that organization leaders were at risk to the competitors who were disruptive innovators poised to provide products and services to preexisting, yet-to-be-discovered, and inadequate markets (Christensen, 1997). This discovery sparked Christensen to clarify the theory of disruptive innovation (Christensen & Raynor, 2013). Christensen (2006) conceded that the degree to which innovation is disruptive depends on the outcomes caused by the innovation. New entrants into the market will not necessarily replace the incumbent and all its profit. Disruptive innovation requires prioritization of time, improvements, and applied focus. The current business model needs to be reviewed to see the present state of the organization's development. Improving existing processes should always be at the forefront of organizational growth. Focusing on moving forward and implementing new strategies is moving in the right direction to sustain or disrupt marketplaces.

This theory highlights the role education plays in embedding teaching practices that prepare future disruptive innovators. Fostering discovery skills among students such as associating, questioning, observing, networking, and experimenting helps create the next generation of innovators. Empowering students to challenge the status quo, foresee alternative outcomes, and initiate intentional growth adds value to many environments. Business/Marketing Education courses align with problem-solving, critical thinking, and creativity skills. Instructional strategies that promote real-world exploration identify Christensen's framework of disruptive innovation. The idea of discovery shifts traditional delivery instruction to innovative thinking that aligns with disruptive innovators who can adapt to change.

Definition of Terms

The following are the terms and definitions used in this study:

Associating

The connecting of unrelated thoughts and bringing them together for the purpose of creating new ideas or improving current processes (Street, 2019).

Career and Technical Education (CTE)

Education programs at the secondary and postsecondary levels develop academic, employability, and job-specific skills for employment (Advance CTE, 2024).

College and Career Readiness

A graduate who has obtained the skills and abilities to enroll or succeed in a postsecondary setting applying real-world applications to be a life-long learner is said to be college and career ready (Crowe & Gagne, 2015).

Deskilling

The reduction of control by employees and the loss of knowledge during the production labor process (Braverman, 1974).

Disruptive Innovation

The focus of widespread advances in technology or business models that disrupt or plan to alter industry practices in a way that obscures current work (Christensen, et. al, 2018).

Experimenting

The viewing of the world as a lab waiting for the outcome and how to capitalize on it (Street, 2019).

Networking

Exchanging information and connecting knowledge from diverse backgrounds to gain ideas (Street, 2019).

Observing

The watching and seeing if circumstances improve before moving forward with new ideas (Street, 2019).

Questioning

The understanding of answers to gain better insight for creativity to make sound decisions (Street, 2019).

Reskilling

This professional learning approach involves learning new skills for a specific job duty (Farlex, Inc., 2011). The method of retraining to meet the demands of the workforce so as not to become redundant (Brugger & Gehrke, 2018).

SBEA

The Southern Business Education Association (SBEA) is a professional organization of business teachers that has consolidated with the National Business Education Association (NBEA). SBEA is comprised of 12 states: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia (Southern Business Education Association, n.d.).

Status Quo

The existing situation or present state of how things are at the current moment (Merriam-Webster, n.d.).

Up-skilling

The method of teaching current employees a new skill so they will be challenged and vital for new positions (Andriotis, 2018).

Limitations

Limitations are the conditions beyond the control of the researcher that may limit and hinder desired outcomes to uncontrollable situations. Limitations in this study included the response rate of individual Business/Marketing teachers, use of a self-reporting questionnaire, the structure of the question ‘what year were you born’ is slightly off because the birth year was reported and not their full date of birth or age all together, the omission of adding the range of years teaching for 16 to 20 years, and the possibility of not being able to clarify a question due to the participants completing the survey independently of the researcher.

Delimitations

Delimitations are the boundaries beyond which the study is concerned. This study involved middle/junior high, secondary, and postsecondary Business/Marketing teachers who are members of the Southern Business Education Association (SBEA) and teach at least one Business/Marketing course. The states include Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia. The results may not be representative of all Business/Marketing teachers.

Assumptions of the Study

It was assumed that participants answered the questions on the survey with authenticity and that they represented teachers in the population. It was also assumed that Business/Marketing teachers wanted to participate voluntarily and were able to complete the survey without any assistance.

CHAPTER 2

Review of Literature

Introduction

This chapter provides a comprehensive review of studies addressing employer's needs, the significance of developing disruptive innovators in curricula, and the purpose of career and technical education in assisting to develop these skills.

The workforce has been disrupted, which is no surprise. According to Carmichael (2015), companies are asking themselves, "Are there specific things leaders can do to bring about change" (para 9)? The answer simply becomes developing a question that can improve the overall productivity of the company, industry, or problem, then working in increments to solve it (BlueSteps, 2019). Research showed that employers are looking for employees with higher-order critical thinking and future innovative building skills to remain globally competitive (Scott, 2020). The transformation of reframing the future workforce is vital to the type of employees they hire, the environments they create, and the ability to make decisions. Preparing for the future can be accomplished through partnerships with K-12 entities, postsecondary institutions, and regional workforce councils.

The future growth of Business/Marketing Education is contingent on the reconstruction of the curriculum to meet employer needs. Regardless of the industry or job, 21st-century skills are essential to employers in that they develop employees' abilities to be successful in the organization and within their own careers. Employees' ability to reinforce the mission and vision of a company is the key determinant of success. In promoting Business/Marketing Education, students can be encouraged to recognize and use innovative disruptor skills as it may enhance their ability to be successful in the workforce and beyond (Christensen & Raynor, 2013).

Associating is the connection of unrelated thoughts and bringing them together for the purpose of creating new ideas or improving current (Christensen & Raynor, 2013). Questioning is the understanding of answers to gain better insight for creativity to make sound decisions (Christensen & Raynor, 2013). Observing is the watch and see if circumstances improve before moving forward (Christensen & Raynor, 2013). Networking is the connection of knowledge from diverse backgrounds to gain ideas (Christensen & Raynor, 2013). Experimenting is the viewing of the world as a lab waiting for the outcome and how to capitalize on it (Christensen & Raynor, 2013). Teachers today have the task of making sure students gain exposure to the world of opportunity that equalizes all. These innovative disruption skills will set the tone for how information is transferred through teaching and learning as formal education strives for continued relevance.

The future of instruction depends on organizations being willing to meet the needs of the workforce and fostering teachers' skills to develop and teach students. According to Garcia and Weiss (2019), teachers are inadequately equipped to handle helping students meet the demands of workforce needs. There is a disconnect between the preparation that teachers receive and the expectations that are placed on them within their institutions. Teacher training programs may face deficiencies and challenges in order to meet educational and professional demands. Therefore, educational institutions are facing urgent demands to ensure teachers have the requisite skills, resources, to meet both instructional and workforce-related expectations.

Employer Needs

The United States is only as strong as its workforce. Business/Marketing Education plays a huge role in preparing a knowledgeable and skilled workforce that supports the American dream through innovation and productivity, along with academics and transferable skills. Cook

(2020) indicated that the aging workforce are individuals who will soon leave the workforce. As workplace trends evolve to compete globally among other nations, the workforce must reskill employees to keep up with the demands. It is unlikely that aging workers will be motivated to seek additional training. The problem is convincing young students to choose careers to replace those workers who are retiring. Opportunities for students to tour manufacturing facilities, participate in apprenticeships, mentorship programs, and internships will provide students insight into various career fields.

As the aging workforce reaches retirement age, companies can use those employees to train the new generation workforce with knowledge and skillsets. Partnerships with businesses, industries, teachers, parents, students, legislators, policymakers, and all others who have a vested interest in education should be the focus that will lead students to careers that drive the global economy. The race to find a talented workforce is highly competitive, from big enterprises to small startups (Campbell, 2017). According to Hughes and Miller (2017), both soft and hard skills are needed, no matter what the company, industry, or job functions. Soft skills, commonly referred to as professional skills, assist individuals in interacting and collaborating with others. Hard skills are teachable abilities that are specific to job responsibilities (Doyle, 2019). Employees' foundational skills can be developed through a variety of education, training, and real-world experiences. Foundational skills can include problem-solving, teamwork, transferable skills, employability skills, and/or other workforce readiness skills. Employee readiness is a critical component of business productivity (Minnesota State CAREERwise, n.d.). While employers want new hires who have strong employability skills, many lack those skills (Levasseur, 2013). Once students leave high school, foundational skills may or may not be taught by their workplace employers.

According to Hurrell (2015), an individual's home life, training programs, or new hire employment programs, may affect whether a new employee will have the skills needed to be successful in the workplace. Developing employability skills refers to enhancing both hard and soft skills such as communication, problem-solving, teamwork, digital literacy, and using technology proficiently. The benefit of obtaining employability skills is that these skills would be transferable to other jobs within business or industry. The ability to use the same skills across multiple disciplines is considered advantageous (Khasanzyanova, 2017). Business and industry need to have a well-rounded workforce that is capable of inclusive growth (Schwartz, 2016). According to Wagner (2010) indicated that the workforce is no longer a knowledge economy, but it is now considered an innovation economy. For example, Google is considered the new knowledge base which has raised questions about specific qualities that new hires should have in order to be competitive in the employment market.

In 2018, Gulbranson (2018) described disruptive technologies that would significantly change lives and the economy such as jobs would become automated, workers would be asked to be flexible, collaborative, and skilled in digital technologies. Since that time, digital skills and capabilities have advanced and have overshadowed knowledge-based skills (Gulbranson, 2018). According to Hendrick (2017), seven million jobs disappeared between the years of 2015 and 2020 and new positions were established due to disruptive innovation efforts.

A group of researchers for IBM and the Business-Higher Education Forum created a matrix for disruptive skills that could be used in the hiring process. The matrix included four types of job skill sets based on workforce demand: escalators, disruptors, stabilizers, and challengers (Hughes & Miller, 2017). Escalators have a lower hiring cost associated with their expertise and a modest need for training and risk for future performance. They do not wait for

others to approve their worth, but instead, do what they know is best. Disruptors have a higher hiring cost because they are hard to find and thrive in a changing environment and tend to jump at something new. Disruptors are adventurers motivated by risk with no concern for facing difficulty as long they find opportunities at cutting edge that break the status quo. Disruptors' job growth is projected to increase at a higher rate (Hughes & Miller, 2017). Disruptors are skilled workers who understand structures, have an analytical mindset, know how to configure information, and overall follow a learn-unlearn-relearn learning pattern (Koibelus, 2016). Disruptors focus on creating a service or product from a mere idea that will improve or sustain current deliverables. Employees who use disruptor skills utilize cognitive abilities to associate and foster creativity when completing tasks. Stabilizers have a low cost to hire, a weak need for new training, and low risk for future performance. They help smooth over things and enjoy a steady workspace (McFarlin, 2017). The status quo gives them solace, and they will see what everyone else does first (Frisinger, 2009). They receive a task and get it done but may not respond quickly to a question due to carefully thinking things through. Challengers are a high cost to hire with a moderate need for new training and risk to future productivity (Hughes & Miller, 2017). Challengers are more opinionated and direct, being less vulnerable to groupthink, which is a practice of making decisions as a group which in turn may discourage creativity or responsibility (Mead, 2015). Challengers do not need to be persuaded to adopt ideas and may be more likely to think outside-the-box and not fall for the status quo (Mead, 2015).

The fourth industrial revolution has brought advanced technological advancements that have transformed the way we live and work to require 21st century skills (Gray, 2016). The skills that are valued in workplaces have evolved in recent years and many skills that were previously not essential in the workspace are now essential (Gray, 2016). Therefore, students are being

prepared to solve problems for careers that do not exist. They must work through abstract scenarios, work in teams, and understand language that may not be familiar to them. A broad set of skills are critical to meet the demands of today's global workforce.

Complex Problem-Solving

Complex problem-solving is the process of addressing issues by using multiple approaches and it requires understanding the dynamics of the issue, considering multiple perspectives, and adapting to evolving circumstances (Gray, 2016). According to Knauff and Wolf (2010), sophisticated awareness refers to an individual's advanced mental processing that allows the transformation of new information based on established information. Problem-solving focuses on the desired outcome and may require a need to identify obstacles and explore possible solutions to overcome the obstacles (Mayer, 1992).

The approach to complex problem solving is using real-world economic and technological situations that are dynamic to generate the desired outcome (Buchner, 1995). For example, cognition can be used to analyze a candle flame and to realize that at some point, it should be extinguished. Cognitive awareness thus reinforces the need to find a solution, if appropriate. In contrast, another example of complex cognition can be when a flame ignites in midair and requires safety considerations to extinguish the flame. In the initial example, the candle flame is predictable; however, in the second example, the flame requires advanced thinking to find a solution to put out the flame. Problem solving to contain future flames may consist of long-term planning which would be to prevent fires from starting and reduce accidents. This type of problem solving is consistent with using logical intelligence to solve problems in industries (Fenton, 2019). There are many ways to solve a problem, and the best approach depends on the actual problem because every problem is different. Researchers have

identified ways to solve problems effectively: accept the challenge, get knowledge, explore multiple solutions, redefine failure, and break it down. Understanding the scope of addressing issues will generate a good outcome.

Critical Thinking

Critical thinking is the ability to think differently by gathering information about a situation (Lewis, 2020). Critical thinking is a natural process that develops beginning at birth. A person can get confused in their learning unless they understand there are different types of critical thinking which can be analytical, creative, or reflective (King et al., n.d.). Over time, thinking takes place in stages through the development and growth of experiences (Gelder, 2005). According to researchers, there are two forms of thought (Edwards & Briers, 2000): low-order thinking (essential remembering) and higher-order thinking (creating and synthesizing information). According to research, “critical thinking aligns with high order thinking in that it uses reflective thinking to make decisions and solve problems” (Sawin, 1957, p. 343). There are many perceived notations about critical thinking concerning ideas, concepts, and interpretations. Businesses acknowledge that critical thinking is a vital skill needed in industry and one of the most difficult traits for employers to find. Educational institutions have incorporated critical thinking skills into curriculum which assists students to become more effective and proficient thinkers. This process needs to be taken more seriously to increase critical thinking skills in achieving desired outcomes for both students and employers (Lewis, 2020).

Creativity

Creativity is one of the top skills employers need. Workers will have to become creative due to the advancements of technology (Gray, 2016). Creativity is about being innovative and taking risks to disrupt the status quo. Researchers have been intrigued by the topic of creativity

for years, and Greek philosophers defined it as a “mystical power” (Albert & Runco, 1999). In modern civilization, researchers are still working to determine why some individuals are more creative than others (Hennessey, 2003). It was not until the 1980s that researchers started discussing creativity as an everyday issue for consumers. Consumer creativity emerged as an essential problem-solving capability toward consumption issues (Richards, 1990). Pictures arranged in a scrapbook with a creative solution are an example of creativity (Kaufman & Beghetto, 2009). According to Sternberg and Lubart (1995), “Creativity is the process of generating ideas and bringing them to existence for an appropriate need” (para 4). Employers today want to produce the best product or service for consumers. Consumers, along with employees, drive the innovation process in the industry by communicating their wants and needs—the cocreation process (Hoyer et al., 2010). Consumers interact with what they want the company to do with customization. This balance of flexibility and creativity is the development of insight for the future workforce. The physical environment is an aspect to effectively and efficiently provide the space to process information and decision making. Creativity is driven by less restrictive spaces that do not provoke or threaten freedom of design (Levavandzhu & Zhu, 2009).

Collaborating with Others

Companies are looking for more inclusiveness that brings people together from diverse backgrounds. Collaborative inquiry is an ongoing process that elicits learning from others (Jewett & MacPhee, 2012). Collaborative inquiry is a process that can move conversations from various levels of dialogue about teaching and learning (Rice, 2012). Members of a team learn together as a component of growing and contributing to improving the organization (Thompson et al., 2004). The dialogue and problem-solving in a collaborative setting are suitable for

company improvement, and in collaborative environments, employees hold themselves and each other accountable (DuFour, 2004). Schrage (1995) revealed several modern-day scenarios of collaboration where people formed teams and worked together to achieve an outcome. An advertising company team and executives work together to produce a new campaign. An oncologist works with the anesthesiologist on whether to continue or terminate a scheduled procedure after the patient shows unfavorable signs of health. A manufacturing company executive works with his technical programmers to see if they should start the production line after a faulty wire is detected. These are a few examples of collaboration that could occur on a daily basis. Without collaboration, the goal would never be reached, and success would be impossible. The sense of team spirit is victorious collaborative successes that are shared and celebrated (Boyer, 2019). Innovative companies are increasing their collaborative efforts and turning their companies into industry leaders in the workforce (Boyer, 2019).

Cognitive Flexibility

The rapidly changing workforce requires employees who are willing and eager to learn new skills. The concept of unlearning abilities to develop new ways of doing things is vital to the development of a company's success (Lewis, 2020). According to Gilbert (2006), the cognitive aspect of modularity allows for a company to be flexible in its pursuit of new opportunities. Cognitive flexibility is seen as a catalyst for change. According to Rindova and Kotha (2001), an organization's structure and culture have an impact on the potential of an organization to change. Cognitive flexibility is defined as an individual's personality traits (Costa & McCrae, 1992). Individuals displaying cognitive flexibility have a vivid imagination, feelings and thoughts, and curiosity. Cognitive flexibility is related to adaptive plasticity in that individuals are readily able to adapt to environmental changes (Duchesne, 1997). Therefore, they can quickly confront

previous problems and generate solutions for new issues (Hatano & Inagaki, 1986). For example, in cutting grass, an individual can be a routine expert in landscaping with the standard tools. However, if the tool is not available, a regular expert may not know what to do. According to Hatano and Inagaki (1986), when a skill is developed with repetitiveness, the practitioner of that skill is not an adaptive expert. However, if the skill is repeated in different situations, it is likely to lead to adaptive expertise. These definitions are mostly the same as cognitive flexibility. Individuals who show how they can alter their solutions are cognitively flexible, typically think outside-the-box, and are more creative (De Dreu et al., 2011). As such, companies are looking for candidates who can revise their way of thinking in any environment.

Emotional Intelligence

Emotional intelligence uses a combination of abilities that relate to self-awareness and management (Lewis, 2020). Popularized by the business field, it has grown as an area of research that is intriguing (Goleman, 1995). Emotional intelligence is commonly considered to comprise problem-solving, managing demands, self-awareness, and development of relationships (Bar-On, 2006). Understanding the Bar-On model and its development, the Emotional Quotient Inventory (EQ-i) must be narrated. The EQ-i is a social and emotional tool that measures emotional/social intelligence using the 15 social competencies: self-regard, emotional self-awareness, assertiveness, independence, self-actualization, empathy, social responsibility, interpersonal relationship, stress management, impulse control, reality-testing, flexibility, problem-solving, optimism and happiness. The competencies are grouped in categories using a five-point Likert-type scale. The EQ-I has 133 items that participants answer to determine understanding oneself, relationship to others, and daily challenges. According to Low et al. (2004), emotional intelligence is a learned ability to express one's feelings in a productive way. The exchange

between individuals involves experience and a range of emotions. An organization is a place for people to interact to complete a specific task or job.

According to Adeoye and Torubelli (2011), employee psychological attachment to an organization is commitment to the vision and goals of an organization. Performing and being intelligent while at work, (making the right decisions, problem-solving, creativity, and collaborating) are valuable to the organization and workforce. Emotional intelligence impacts the success of the company when employees interact, strategize, and create. Motivating people to become engrossed in their work is vital to an organization. Emotions from many factors may spill over to their job duties and may affect their work performance (Ravichandran et al., 2011).

Disruptions can carry inherent risks and whether successful changes are made or not, it may be determined by the contributions and perspectives of the stakeholders that are involved in the jobs. As jobs reshape, ensuring a robust workforce pipeline will require that educational entities broaden the learning community as new skills evolve (Bersin, 2019). The workforce needs skilled workers who are ready to work and have the knowledge to perform their duties. Today's employees are transitioning from traditional careers to upward mobility in various directions. Instead of working long term in one company and waiting for promotions, employees have the flexibility to choose short-term relationships, moving from one job to the next to advance their careers (Ibarra, 2015). This allows job structure flexibility where employees can try out different jobs and not be committed to just one position over a period of time.

Job Structure Flexibility

Job structure flexibility allows employees to try out a variety of positions and remain flexible instead of committing to a long-term position. As an example, the term "gig," which originated in the music industry, refers to performing work with short-term employment with no

future promise of full-time jobs (Abraham et al., 2017). Gig workers are typically only employed for a specific time and are no longer needed when the project is complete. Gig workers provide a wide range of services, such as laborers on construction sites, janitorial workers at night, and adjunct instructors at colleges/universities (Brenoff, 2010). Some gig workers previously held similar roles in traditional employment situations but may have lost their positions due to a variety of reasons (Greenwald, 2012). Gig work allows employees to distinguish themselves as having the skill sets needed to complete their new job, but their past employment is not a factor (Greenwald, 2012). Generally, gig workers are hired on the spot but have no promise of future work, wage increases, or deferred compensation. Gig jobs provide the flexibility for workers to move freely from one position to the next without an expectation from the employer that they will stay longer. Hiring workers for the gig rather than to fill an ongoing role in the company gives employers the flexibility to offer wages based on the job and precludes the need to provide benefits (Henderson, 2013).

Companies continue to generate revenue with the idea of new models and platforms, such as Uber, Lyft, and Waiter, by taking up a substantial portion of the market share with the disruption of long-standing companies and displacement of incumbents (Zervas et al., 2015). The rise of gig workers gives entrepreneurs the motivation and courage to explore the option of flexibility to earn a wage. In contrast, it involves labor contracts for employers to hire on a short-term basis rather than a longer-term basis, which includes additional stipulations (Brenoff, 2010). As employers maneuver through the idea of gig workers, it is important to find good employees who display discovery skills.

Discovery-Delivery Skills

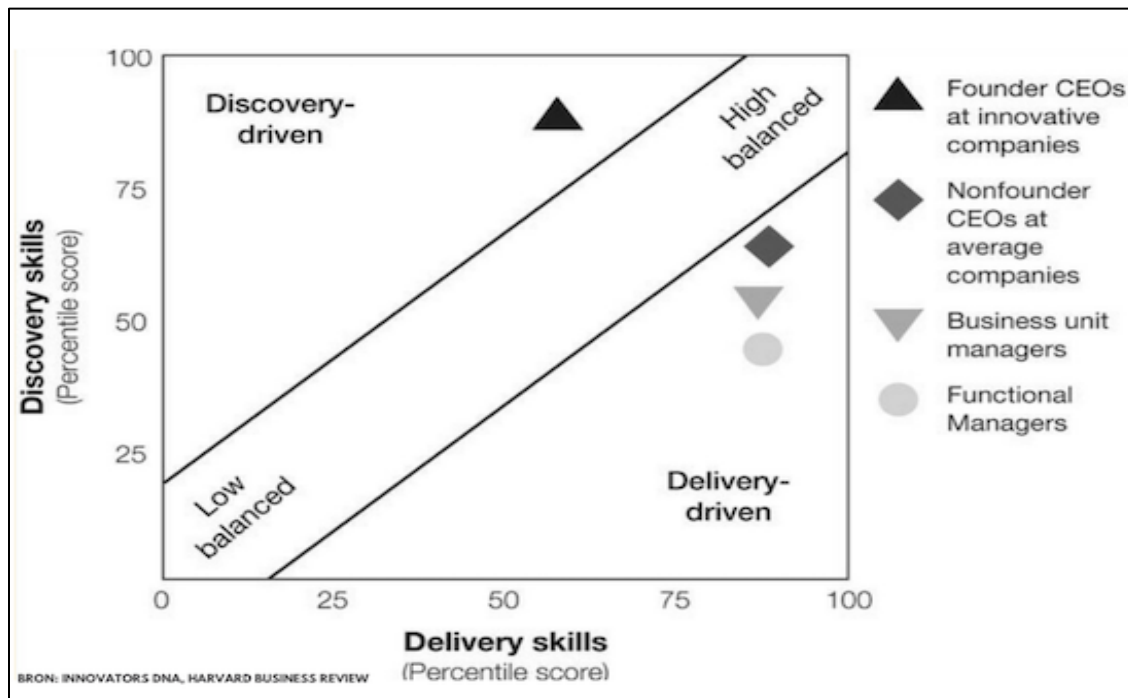
The road to success for companies lies in the path that is taken to produce a sustainable outcome. In a world where revenue is needed to sustain a company, the ability to include innovation can keep a company alive (Skillicorn, 2016). For innovative company executives to be creative, they must understand what innovation means. Innovation is the implementation of an idea that has an impact (Marquez, 2013). New ideas can emerge as a result of what is known as discovery skills: associating (connecting unrelated thoughts and bringing them together for the purpose of creating something new or sustaining), questioning (ask thought-provoking questions to gain better insight for creativity), observing (watch and see approach), networking (learning new ways of doing things), and experimenting (looking at future outcomes and how to capitalize on them) (Dyer et al., 2011). These skills are typical traits of innovative executives and allow new ideas with a clearer vision for success as compared to traditional executives that may exhibit a different set of skills.

Equipping students with the skills and mindsets necessary to become disruptive innovators may emphasize the need to develop discovery instead of traditional delivery skills. Dyer et al. (2011) explained that traditional executives typically use delivery skills that include: analyzing, planning, detail-oriented implementing, and disciplined execution. These skills are ideal when using computer systems such as Microsoft Access and Excel. The more calculations you add to the spreadsheet, queries and filters, the better the results. If there are more issues anticipated, the calculations and results can be more in depth and informative. More comprehensive results are valuable to a traditional executive because the results can create positive outcomes. Figure 1 shows that high profile innovative founding executives scored 88% on discovery skills and only 56% on delivery skills. Whereas non-founding executives scored

80% on delivery skills and 62% on discovery skills. This data reveals that innovative organizations are led by innovative minded people so if individuals want to be successful and move up, an innovative mindset is essential (Dyer et al., 2011).

Figure 1

Discovery-Delivery Skills Matrix



Dyer, J.H., Gregersen, H. B., & Christensen, C. M. (2019). *The innovator’s DNA: Updated with a new preface; mastering the five skills of disruptive innovators*. Harvard Business Press.

Innovations and Maintaining Traditions

It is easy to be absorbed in social media promotions or excessive cellphone use. Whether welcomed or not, technological advancements are a fact in daily life. The creativity and innovation found in new products and services foster curiosity levels and individuals are demanding more and more technological advances and innovations. Innovation can assist declining markets by increasing market presence or keeping company expenditures down;

however, innovation may also cause a reduction in force as employees may lose their jobs due to innovative advances (Dyer et al., 2011).

Traditions keep us doing what is familiar to us. The tradition of printed newspapers and telephone booths provided a way of communication that was appropriate for the market it served. Traditional practices have structures and principles that companies have used for years that served their purpose for planning and processing with a hands-on approach. The manual process increased the chances for human error and excessive time to correct the issue which increased profit loss. The value of traditional practices shapes a company's interaction with one another and builds the team's morale as they are more personable. As traditional practices are becoming obsolete, innovation is making its presence known by showing teachers the skills students need to be globally competitive in the workforce.

Significance of Developing Disruptive Innovators within Curricula

Achievement gaps continue to persist in education between suburban public-school students and their urban and rural counterparts, which is demonstrated by students' academic and postsecondary career decisions (Wagner, 2010). Student achievement is measured based on test scores and the benchmarks set by each state. The teaching strategies, curricula, and assessment tools used today were designed for an era that has passed and no longer pertains to the needs of the current public education arena (Wagner, 2010). The standards for common career technical core describe 12 career-ready practices that should be included in all career and technical programs (National Association of State Directors of Career Technical Education Consortium (NASDCTEC), 2012). They include the following: act as a responsible and contributing citizen and employee; apply appropriate academic and technical skills; attend to personal health and financial well-being; communicate clearly, effectively, and with reason; consider the

environmental, social, and economic impacts of decisions; demonstrate creativity and innovation; employ valid and reliable research strategies; use critical thinking to make sense of problems and persevere in solving them; model integrity, ethical leadership, and effective management; plan education and career path aligned to personal goals; use technology to enhance productivity, and work productively in teams while using cultural/global competence. The ability to demonstrate innovative skillsets, which is a behavioral function, and not just a capacity of the mind alone is what companies are looking for in employees (Street, 2019). These innovative skills relate to the five skills of disruptive innovator skills—associating, questioning, observing, networking, and experimenting—which are the discovery skills of tomorrow (Street, 2019). The more emphasis placed on the value of these skills, the more likely students are to understand their significance in relationship to the curriculum being taught. The Carl D. Perkins Career and Technical Education Act of 2006 provides federal funding for the enhancement of secondary and postsecondary career and technical education programs (NASDCTEC, 2014). The goal is to create common standards that are benchmarked, no matter what the students' academic level. As a result, career clusters were identified that highlight 16 career choices for students to discover their postsecondary interests (NASDCTEC, 2012). According to Imasuen (1999), syllabi represent documents of course intentions that are given by teachers to convey student expectations and course outcomes.

For the curriculum to support students' development of discovery skills, the curriculum must address the discovery skills such as associating, questioning, observing, networking, and experimenting. Equipping students with the skills necessary to be innovative may be accompanied by problem-solving and entrepreneurial approaches to meet consumer demands. Kost (2019) found that requests for innovative and new products are brought on by consumers.

To develop students' discovery skills, teachers must integrate technology into required course subjects, which provides differentiated instruction in various forms. Businesses, inventors, and entrepreneurs are on board to better guide schools on the needs of a growing market, so that schools can better prepare students for specialty areas to transform markets for which services or products are provided (Lagace, 2018). Students must use their cognitive awareness skills to connect their ideas and thoughts together to create something unimaginable.

Disruptive Innovator Skills

Disruptive innovators should develop specific discovery skills. The disruptive innovator skills consist of associating, questioning, observing, networking, and experimenting (Dyer et al., 2011).

Associating

Associating is known as the cognitive skill of the five skills of disruptive innovators. It is connecting unrelated thoughts and bringing them together for the purpose of creating something new or sustaining it (Dyer et al., 2011). Associating involves the ability to make connections across multiple areas by pursuing the latest information. Research shows that teaching creativity can improve a students' academic ability (Lizarraga et al., 2009). Using various pedagogic approaches to teach creativity increases student performance in comprehension and transferring skills and knowledge (Sternberg & Grigorenko, 2004). Creative thinking incorporated in classroom instruction such as open-ended questions, real-world problem solving, and analogies may help with student engagement that improves achievement (Schacter et al., 2006). According to Torrance (1992), nationally, a vast range of opportunities for creativity should be available for students. Activities that reinforce creativity include finding multiple solutions, discussing, and sharing ideas, and experimenting (Hong et al., 2013, McCune, 2009). In this innovative age of

society, students must be able to use these skills to generate innovative products and services for employers. Teachers are the resources to strengthen students' creativity.

The great innovator Walt Disney saw himself as a creative spark. He did not do the work to make Disney a magical wonderland but rather had ideas to ignite creativity throughout the company. Innovative people combine their own ideas with those of others. According to Wolf (1996), "people connect experiences they have encountered and come up with new things" (p. 16). The ability to blend ideas into a new, combined narrative is an associational cognitive ability. Dyer et al. (2011) referred to this cognitive ability as an intelligence that is developed rather than a skill that is inherent at birth. Associational thinking comes from different sources that engage in questioning, observing, networking, and experimenting, which are the four behavioral skills of disruptive innovators (Dyer et al., 2011).

Within a classroom, there are ways to develop associating abilities within students. Here are some examples of how associating can be used as teaching strategies. For example, innovators can make new associations like joining a microwave due to the high radiation volume and a dishwasher to sanitize without water (Dyer et al., 2011). Teachers can probe an issue or opposition that their school is facing, identify an unrelated idea that has nothing to do with the original problem, which leads to associating the two together for a new design to solve the problem. Innovators take on a persona in a different way. Teachers can have students write down a list of companies in the same industry or not on index cards and creatively brainstorm on how a merger between two of these companies creates new ideas. The collaboration has the potential to create a new product or service never imagined. There are teaching strategies that could support or reinforce associational thinking, such as learning centers and numbered heads together.

Learning Centers

Learning centers are areas designated for exploration of exciting and interesting ideas that are authentic and unrelated. The idea is to allow students to be accountable for their own learning that creates a style of learning that gains a more profound sense of understanding. Over the past decade, there has been an exponential growth of data management of knowledge, the need for rigor, and collaborative learning which can lead to associational thinking. The need to grow in a social context involves a cognitive level that has not been required in the past. Learning centers have a unique structure because they address the needs of the students in an academic setting that provides support for all (Sorcinelli, 2002). The evolution of learning centers has a rich history in the pre-k to 3 grades that can be duplicated in the secondary classes (Movitz & Holmes, 2007). Providing these more open-ended, exploratory activities allows students to use associations to approach the work in novel ways.

Numbered Heads Together

Numbered Heads Together (NHT), a cooperative learning structure, is considered as a Tier 1 instructional strategy. Tier 1 instructional strategies are universally applied teaching and learning strategies that prevent learning and behavioral problems for students. Using these strategies, students are strategically placed in the classroom to receive high-quality instruction from the teacher that reduces the chances of misbehaving (Kagan & Kagan, 2009). Numbered Heads Together (NHT) engages students in a collaborative and discussion-driven approach that creates an environment for learning. Students write their own responses to the teacher's questions, share answers in small groups, and reach consensus. Lastly, a member of the group is given the opportunity to share the group's response (Hunter et al., 2015). The NHT cooperative learning model has several advantages, including increasing student achievement, self-

awareness, collaboration, communication, and respect among their peers irrespective of differing opinions (Nursyamsi, 2016). Through the consensus-building steps, students must use association to meld their ideas into unified concepts that address the problem. Once the students understand the activities that help them associate different ideas, they begin the process of asking questions to gain a better insight for the unimaginable.

Questioning

Innovators ask thought-provoking questions from others to gain better insight for creativity. Questioning techniques can activate prior knowledge, during instruction to help students understand content, and after instruction to extend the teaching. For students to be more active in their learning, they need to ask questions. According to Wilson and Smetana (2011), Students who ask questions are regularly activating their thinking—"Does this work?", "What does it do?" "What if this happens?"—to map their learning (p. 85). According to Rouse (2014), "self-questioning techniques work with students no matter the age or learning ability level. These activities are flexible within core curricula, environments with groups, and can be modified depending on the student" (p. 124).

Albert Einstein understood that questioning was a critical step to learning and solving problems. The formation of the problem is a higher priority than the solution (Spitzer & Evans, 1999). After returning to work at Apple, Steve Jobs used the philosophy of not being motivated by money to spur innovation, creativity, and design new possibilities (Deutschman, 2011). This type of philosophy shows that excellence has no constraints in providing for customers' wants and needs. Innovators work toward constructing more significant questions. A process called question storming focuses on brainstorming questions about the problem (Goldberg, 1997). The team or individual writes down 50 questions about a problem, then prioritizes the most important

of while searching for better solutions through observing, networking, or experimenting. Cultivating question thinking is a technique when statements are made. Students write down three challenges they face in the classroom setting and often translates them to a statement form. The students can reformulate the statements leading to innovation that can actively have students take steps to find a solution. There are strategies that can support questioning for future innovators, which are inquiry-based learning, think-pair-share, and anchor activities. These strategies are examples of teaching strategies that can reinforce the discovery skills of questioning.

Inquiry-Based Learning

Inquiry-based learning is a form of constructivist learning in which the learner gains insight on a particular topic (Brew, 2003). The interest is stimulated by the learner, which enables a deep understanding of the material being presented. With inquiry-based learning, learners select topics that interest them and then create questions, research resources, and information; look at relevant content; and interpret data. This approach allows the student to write a report or create a presentation. Inquiry-based learning has four types: structured, controlled, guided, and open which provides real-world connections through critical thinking. These learning strategies reinforce critical thinking skills and are examples of teaching strategies that can reinforce the discovery skills of questioning.

Structured Inquiry. The teacher leads this inquiry approach. The entire class is engaged on one inquiry together. The questions and steps are provided by the teacher; the results are unknown. Students will generate outcomes supported by research.

Controlled Inquiry. This is the easiest inquiry-based approach. The teacher develops a framework of questions and steps. This will guide students to produce results to reinforce a

previously introduced idea to establish a new design and solve a problem. Students use a summative assessment to demonstrate their understanding.

Guided Inquiry. The guided inquiry approach allows students to take control of the questions and steps. The students are provided with the goal and the process. Next, students design the items to produce an answer for the teacher. The students build on the skills from the previous inquiries by incorporating problem-solving and critical thinking skills.

Open Inquiry. The open inquiry approach allows students to take ownership of their questions, steps, and findings. They choose the topic and start the process to conduct the investigation. The teacher acts as the facilitator, if needed. Once the study is complete, the students will, in a creative way, prepare a presentation to reveal their findings (Bamchi & Bell, 2008).

Think-Pair-Share

Think-Pair-Share is another technique cooperative discussion strategy that was developed by Frank Lyman and his colleagues at the University of Maryland in 1981 (Robertson, 2006). The name was derived due to the three stages of action that emphasize what students will do at each stage (Marzano & Pickering, 2005). The first of the three phases are to think. The teacher encourages students to generate prior knowledge to form a thought or question—next, the students' pair with a partner. The students take time to think about the question paired with a peer to discuss their answers. This process enables them to take mental notes to draw a hypothesis about the best solution that is unique, which can create the most rational solution. Lastly, sharing allows students to deliver their thought process with the rest of the class (Robertson, 2006). Research by Whimbey and Lochhead (1986), supported the idea that think-pair-share teaching strategy encourages problem solving and collaboration that requires talking

aloud to untangle problems to create an innovative solution. This process of learning for students allows them to be aware of what others are thinking and collaborate on the best ideas to create new ideas for products or services. The collaboration is developed by asking thought-provoking questions in a way that requires critical thinking skills to emerge to create an unbiased analysis of the information presented.

Anchor Activities

Another type of anchored collaboration is used for reviewing activities to create useful discussions (Guzdial et al., 2001). An example is groups of people studying for a test where students create sample questions and ask questions about an assignment among each other. This approach allows the students to support each other in a collaborative effort for a common goal. These activities are meant to be less demanding and do not require constant feedback or directions.

Observing

Observing is watching and seeing if they can improve the circumstance. Observation allows innovators to learn about activities through natural settings by witnessing and participating. According to DeWalt and DeWalt (2010), observation can help innovators by answering and understanding the context of how things work. Becoming an active observer of learning takes practice and collaboration (Merriam & Tisdell, 2015). Christensen and Raynor (2013) argued that when people and companies need jobs to get done, they look around for a product or service to fulfill that need. Observing is awareness about a job that needs to be done and maybe in a better way. An example would be a school system and the lack of interest from students to remain enrolled and not dropout. If the needs of the students are not being met, they are less likely to be engaged. An example of observation was a charter school that, based on

review and feedback, redesigned its curriculum to meet the needs of students by providing a fun environment to engage with their peers and activities to complete collaboratively. The redesigned curriculum had the potential to meet the emotional and social needs of the students which looked beyond a functional need, but a service rendered. In developing the observation skills in students, teachers could consider exercises to assist in building this skill.

Observation is an excellent way for students to understand the daily operations of the business. As students observe, they construct inquiry thoughts about ideas that can be transferred, such as how the job or company relates to their current situation and career goal. Observing fosters the desire to investigate something. Students can set aside 10 minutes a day to focus on something and take notes. Once they take notes, they can try to think of a new idea. While students are away from school, they can take pictures or journal about their experiences and offer solutions. For future innovators, KWL, job shadowing, and anchor activities have the potential to support and reinforce the skill of observing.

Know, Want to Know, and Learned (KWL)

Know, Want to Know, and Learned (KWL) provides a framework for learning that can be used across the curriculum to assist students with actual meaning (Ogle, 1992). Each letter in the name acronym KWL explains the purpose of showing how it creates a cohesiveness for understanding. The K represents how prior knowledge is generated from a particular cue. Whereas the W is a fact that is already known revisited by a context clue of a subject or topic. Furthermore, the L represents the understanding on the subject based on new evidence presented that was not already known. It is then easily transferred into a method for students' independent study. Learning begins when students have a sense of disequilibrium in their own knowledge and are stimulated to want to learn. The reflection that goes on after reading is vital as a clarification

time to see whether students have determined all that is important and whether misconceptions remain (Ogle, 1989).

Job Shadowing

Job shadowing is when a student observes and models one employee or worker at a workplace for one or more days to learn about a particular occupation or industry. Job shadowing enables learners to refine their career objectives, select a career focus area for the latter part of high school, and participate in a more advanced level of work-based learning (WBL) (Johnson et al., 2005). This provides a deeper insight into the job as to whether it would be a good fit for the person shadowing the worker. As a result, this type of activity assists in understanding and selecting the right career option.

Networking

Innovators increase their knowledge from people with diverse backgrounds. Over the years, research has shown that networking is a component of organizational life (Brass et al., 2004; Burt et al., 2013). Networking behaviors allow individuals to develop new relationships with diverse groups of people (Vissa, 2012). Networking can build upon existing systems or structures. Research indicates that individuals may derive different benefits and varied advantages from their connections (Burt et al., 2013). An individual's work outcomes are not just about the systems they have, but the behavior that is a part of those networks (Kellogg, 2014; Lingo & O' Mahony, 2010). However, it is acknowledged that achieving work and career outcomes are an advantage of networking (Gibson et al., 2014; Porter & Woo, 2015; Wolff et al., 2008). Innovators gain a different perspective when they connect with those who think differently from them. Unlike typical executives who network for resources, innovators connect

based on ideas that lead to a different perspective. By talking to people who have diverse backgrounds, innovators mobilize support for a new idea.

Innovators may participate in conferences, such as Technology, Entertainment, and Design (TED), which are designed to intrigue their minds to create multiple concepts that affect associating skill. A discussion not related to the specific area of concentration is enormous for networkers to spark new ideas. In developing networking skills in students, research has considered a few exercises to help teachers. By writing the names down of people they typically talk to and have a relationship with, students can expand their network. Students then think about factors such as individuals' backgrounds and demographics and how they can add value to their life through networking. Also, students can shadow experts from different industries, whether interested or not, to gain insight into doing things differently in both industries after observing. There are teaching strategies that could support or reinforce networking for future innovators, several are guest speakers, work-based learning, and internship.

Guest Speakers

A guest speaker offers new ideas to a student that may differentiate the way a specific subject is taught by the teacher (Leor, 2015). Guest speakers allow for a better experience for the student and teacher that will expose them to a different point of view. Students can be completely submerged in a topic that keeps them intrigued for future exploration beyond the classroom. Outside influencers often have the most impact on students that affect what they do and/or what happens.

Work-Based Learning (WBL)

Work-Based Learning (WBL) refers to collective agreements between professional and/or educational institutions, where students can experience work and learning environments

(Amadi, 2013). Work-Based Learning (WBL) is an attempt to increase the walls of the classroom to include the community as a learning resource. Students are actively constructing knowledge through their interactions with the employer to increase cognitive awareness, increase socialization skills, and develop self-efficacy attributes that broaden the student's horizon. Educational institutions are under pressure to develop and implement new innovative approaches to learning from business and industry entities, Work-Based Learning (WBL) is one such approach to increased innovation within the classroom (Marchioro, 2009).

Internship

An internship is an experiential learning exercise that applies theories in the classroom to real-world simulations (Lam & Ching, 2007). Internship is a one-time, short-term placement of learners in an environment that provides practical experience consistent with the students' program of study. It is designed to ensure intensive observation of how the intern performs tasks in specific job areas (Schrenko, 2010). Students are given the opportunity to use their skills and knowledge in an environment that resembles what theories have stated. The process of applying the learned behavior may generate the urge to explore in more detail.

Experimenting

Experimenting is looking at future outcomes and how to capitalize on them. In the context of imaging, the design of experiments, it triggers human-like characteristics to create something new (Brandt & Binder, 2007.). However, much like phrasing questions to understand what the answer might be, specific insights depend on experimenting. An experiment needs some form of intention to test the hypothesis, a problem to be solved. The analysis is an interpretation of what is essential about the outcome. The idea is to accept or reject the result by asking what it can do for future developments. According to Dyer et al. (2011), innovators have

three ways that can be experimented: try out new experiences (develop a new skill); take apart products, processes, and ideas (taking things apart); and test ideas through pilots and prototypes (build a prototype). Steve Jobs discovered the art of calligraphy when he visited a calligraphy class while in India (Dyer et al., 2011). Michael Dell experimented by dismantling a computer at an early age of 16, inventor Michael Lazaridis at Blackberry tested a proposition through prototypes. These experimental approaches were found to generate innovative ideas. In developing the experimenting skill in students, research has considered a few exercises to help teachers. Students can create a plan to learn something new or network with people in the community while experiencing opportunities for growth. In addition, students can identify ways to improve something and what problems it can solve. Everyday household or classroom items can be the materials used to transform for an invention. Students can become the innovators they never thought they could be by using questioning, observing, and networking skills while experimenting, which is helpful on what might work as a future outcome to accomplish success. Teaching strategies that could support or reinforce observation for future innovators are virtual simulation, field trips, and Career and Technical Student Organizations (CTSOs).

Virtual Simulation

Simulations are usually organized, challenging scenarios that have been created to reinforce a concept that has been developed to mimic the real world (Aldrich, 2009). Virtual simulations bring a different dynamic that is more fun and engaging that is easily adaptable. The interactive component gains the attention of many kinds of learners, such as kinesthetic (hands-on style), auditory (listening style), and visual (seeing style). There is no one universal method for retaining information that will work for every student. Sometimes experiences allow us to address what was the best way to obtain and retain information. The use of this differentiated

instruction provides for a deeper understanding that still can give rigor that advances students to the next level.

Field Trips

Field trips provide enriching educational experiences for students by reinforcing classroom lectures and activities (Falk et al., 1978). Field trips provide an outlet from the traditional school day by allowing students to leave the school and explore an unknown environment. For example, a field trip to a local manufacturing company would enable career exploration and career awareness for the learners at their formative stage. Specifically, planned field trips to businesses and industries give students opportunities to explore different workplaces (Nebraska Department of Education, 2019). The field trip should be a hands-on experience, focusing on activities that cannot be conducted in the classroom or laboratory to bring out the creativity in students (Orion, 1993).

Career and Technical Student Organizations (CTSOs)

Career and Technical Student Organizations (CTSOs) assist in providing workplace readiness success skills through collaboration, problem-solving, leadership, critical thinking, and academia (Threeton & Pellock, 2010). Since the passage of the Smith-Hughes Act of 1917, CTSOs have been an integral part of CTE. They provide learning activities outside of the classroom as a culminating product to demonstrate the learner's awareness of essential skills for the future workforce (Kosloski, 2014).

Importance of an Alignment

According to Duchesne and McMaugh (2019), due to changes in the educational landscape of the 21st century, effective teaching practices can be tracked to an educational psychology experience in school settings. Those preparing students to be disruptive innovators

will need tools to build skills to assist in developing innovative skills (Lagace, 2018).

Technology allows learning to happen anywhere, but if a digital format is not available, students will move from their formal education forced to figure these skills in the workforce (Schwartz, 2016). According to Mauricio (2018), the future of education and technology requires creating a workforce with an expanded skill set. The tools for effective alignment methods for specific goals are based on national and state standards (Martone & Sireci, 2009). Therefore, aligning education with workforce needs is critical for ensuring student learning, professional development is needed for teachers (Martone & Sireci, 2009).

Alignment occurs when the expectations and assessments meet the needs of the student to guide them on what they are expected to know and do (Sultana, 2018). For example, medical education has refined its curricula to meet the needs of the students, patients, and teachers. Students are provided preservice learning opportunities that hone their skills so that patients are reassured that medical students have the basic knowledge and skills needed to treat them. Meanwhile, these opportunities help teachers better prepare their students for working in the health care industry (Kulasegaram, et al., 2018). The University of Toronto MD program had a review of its curriculum that required innovation of virtual case studies, creating mental health novel programs for complex patient care, and performing programmatic assessment (Kulasegaram, et al., 2018). In other words, the demand for innovation was coupled with a requirement for ongoing evaluation to ensure that the curriculum was aligned with needs. Curriculum alignment is shifting toward the world of work. Education innovation is on the horizon for educational institutions, and one key component is curriculum mapping (Kulasegaram, et al., 2018). Curriculum mapping usually comes in the form of graphics that illustrate how learners build a mastery level of understanding (Giamellaro et al., 2017). Precise

curriculum mapping lines of communication open for collaboration among teachers, students, and administrators (Miller, 2019).

Career and Technical Education

The future workforce is to be thought of as a partner, not an enemy. The change is coming and preparing the next generation of workers is critical (GrayLine Group, 2018). It involves all stakeholders, including but not limited to businesses, communities, school systems, and families, to make a successful transformation. Vocational education to career and technical education (CTE) is the result of changes in the workforce. Traditional vocational education was centered around trades with less focus on academia. The idea was vocational education was targeted at students not interested in postsecondary education. The career and technical Education (CTE) curriculum development was influenced by Senator Hoke Smith and Congressman Dudley M. Hughes with the Smith–Hughes Act of 1917 (Smith, 1999). It was the first CTE Act to promote CTE education curriculum under the leadership of President Woodrow Wilson, who appointed a team to study the needs of vocational education (Smith, 1999). Senator Hoke Smith was a lawyer, and Dudley Hughes was a farmer, and because both men chaired separate committees, one House Senate Committee on Education and Labor and the other House Committee on Education, their names were attached to the law. The act was not necessarily the founding of teaching CTE training but provided federal funding to aid in teaching vocational education to make instruction authentic and provide standards for programs. The purpose of the act was to prepare students for employment opportunities (Moore, 2017).

Career and Technical Education has served as an intervention for at-risk students because practical, hands-on applications allowed for a more real-world experiences that added value to their education. Fast-forwarding to present-day, the current legislative act is Perkins V which its

formal name to strengthening CTE for the 21st Century Act (Imperatore, 2017). This act is the new name from the Carl D. Perkins CTE Act of 2006 (Perkins IV). The new Perkins V expands opportunities for all children to follow a CTE career pathway of their choice. States and communities would have the autonomy to be flexible in the placing of funds for local program needs. There would be less focus on administrative control, but program alignment for the needs of the community.

The goal of education should be to encourage thought-provoking questions in terms of rigor to thinking outside of the box. The goal of a teacher is to be a facilitator of learning, rather than as an expert who simply delivers information to students. The historical leaders who influenced CTE curriculum development are Charles Prosser and David Snedden. Charles Prosser was unsatisfied with the high school curricula that promoted endowment and higher learning (Gadell, 1973). He advocated for vocational education to help students obtain a job, retain a job, and job advancement. Charles Prosser believed that traditional schools needed to be separate from vocational schools to provide students with practical applications of learning. He found that farm work and mechanical problems had to be taught as project methods and was convinced that the industrial processes would change, so he created short-term courses for reskilling and expanding knowledge (Gadell, 1973).

The Prosser Resolution of 1945 shaped vocational education in the United States as it was a response to concerns that students were not being adequately prepared for practical life and employment. Students would benefit from instruction that aligned with real-world skills, specifically for the communities that they lived in. Prosser's efforts were heard around the world, and he became known as the most successful curricular innovator in career and technical education. David Snedden was best known for designing an educational program that reflected

the industry demands and interests of students (Hullfish, 1924). He advocated for public schools to provide skills training for students to be prepared for life. Snedden introduced practical education through learning by doing and solving social problems in the community (Hullfish, 1924). He opposed the traditional ways of learning and supported the idea of teaching across the curriculum, which promoted the interest of the students for future careers.

CTE provides technical and academic skills for students to succeed in postsecondary careers. Students are prepared by introductions to workplace environments and hands-on experiences (Advance CTE, 2024). Researchers, including Rowan-Kenyon et al. (2011), indicated that linking academic development with career development and college awareness increases students' career and education goals. CTE programs are based on the following 16 career clusters below and 79 pathways that specify career occupations (What Is CTE, 2020):

- Agriculture, food, and natural resources
- Architecture and construction
- Arts, audio/video technology, and communications
- Business, management, and administration
- Education and training
- Finance
- Government and public administration
- Health science
- Hospitality and tourism
- Human services
- Information technology
- Law, public safety, corrections, and security

- Manufacturing
- Marketing, sales, and services
- Science, technology, engineering, and mathematics
- Transportation, distribution, and logistics

CTE programs help students prepare for postsecondary careers in numerous courses, ranging from beginning to advanced curriculum, which also includes apprenticeships, internships, and job shadowing. Students who actively participate in CTE programs are 88% more likely to continue a postsecondary track after graduation, and 60% plan to pursue additional training related to their area of study in high school (What Is CTE, 2020). Therefore, the process of learning by doing is an essential component of Business/Marketing Education. As students transition from the classroom to a real-world simulation experience, they see the connection to a career pathway.

Experiential Education

According to Scott and Sarkees–Wircenski (2008), Business/Marketing Education provides experiences for students to explore career opportunities to prepare them for life after high school to be self-sufficient, productive citizens in society. Business/Marketing Education curriculum includes an introduction to foundation skills, personality attributes, critical thinking, as well as employability and technical expertise for career pathways. For example, Business /Marketing Education such as personal finance must have appropriate simulations spaces so students can demonstrate their understanding of the concepts taught in the classroom. Students learn theories and concepts that are applied as problem-solving skills, and hands-on experiences are referred to as authentic experiential learning in the Business/Marketing Education setting. Additional real-world experiences, such as on-the-job training, dual enrollment, and simulated

workplaces, provide specific skills for students in different configurations that are part of Business/Marketing Education. As the workforce continues to change, it is imperative that the educational systems re-think their approach to how students are being prepared to meet those demands.

Summary

This chapter provided a comprehensive review of studies addressing employer's needs, the significance of developing disruptive innovators in curricula, and the purpose of career and technical education in assisting to develop these skills. The United States is only as strong as its workforce. Business/Marketing Education plays a huge role in preparing a knowledgeable and skilled workforce that supports the American dream through innovation and productivity, along with academics and transferable skills. Cook (2020) indicated that the aging workforce are individuals who will soon leave the workforce. As workplace trends evolve to compete globally among other nations, the workforce must reskill employees to keep up with the demands. The transformation of reframing the future workforce is vital to the type of employees they hire, the environments they create, and the ability to make decisions. Preparing for the future can be accomplished through partnerships with K-12 entities, postsecondary institutions, and regional workforce councils. Chapter 3 presents an overview of the methods that were used for this study. There are detailed sections that discuss participants, instrument design and implementation, validity and reliability, data collection, and data analysis.

CHAPTER III: METHODS AND PROCEDURES

This chapter consists of the following major topics:

Introduction

Population

Research Instrument and Research Implementation

Validity and Reliability

Data Collection and Analysis

Summary

Introduction

The purpose of the study was to investigate whether disruptive innovators are being prepared in middle/junior high, secondary, and postsecondary Business/Marketing Education classrooms. This study investigated the following: (a) the perceived level of Business/Marketing teacher's discovery skills, (b) the extent that Business/Marketing teachers are integrating discovery skill teaching strategies in the classroom, (c) the correlation between the level of a Business/Marketing teachers perceived discovery skills and the extent to which Business/Marketing teachers are integrating discovery skill teaching strategies in the classroom, and (d) the differences among Business/Marketing teachers perceived discovery skills level and their demographics/characteristics (highest degree, teacher certification, race/ethnicity, number of years teaching, type of school, state of employment, and gender).

The researcher received permission from the Institutional Review Board at Auburn University to conduct the study. Permission was also requested from participants via email occupied by an information letter and survey.

Population

The participants in this study were Southern Business Education Association (SBEA) members who received an email (Appendix A) from the association president seeking their participation in the survey to ensure an accurate sampling frame. A total of 583 SBEA member participants received the electronic survey link. These participants represented the following states: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.

Research Instrument

The researcher's instrument utilized components of The Innovator's DNA Self-Assessment (Dyer et al., 2011). The original Innovator's DNA Self-Assessment was distributed to 512 managers and executives to analyze their discovery skills and delivery skills. An analogy can be inferred between managers and executives and educators in that they are both responsible for their high achieving environments and creating cultural growth. The 20 items in section one provided the framework for the discovery skills constructs:

- Associating (Connecting unrelated thoughts to create new ideas)
- Questioning (Understanding of answers from asking "what if")
- Observing (Watching trends and people before moving forward)
- Networking (Exchanging information from diverse people)
- Experimenting (Viewing the world as a lab and waiting for the outcome)

A 5-point Likert scale was used ranging from 5-Strongly agree, 4-Somewhat agree, 3-Neither agree nor disagree, 2-Somewhat disagree, and 1-Strongly disagree. To score the survey, the odd-numbered item responses were only used and added together to reveal the overall composite score for identifying the discovery skills. For the purpose of this study, the research focused on

the odd-numbered items which were the discovery skills that aligned more with the study's goal of identifying the constructs that drive an innovative mindset. The researcher's instrument scale ranged from very high on discovery skills if the total score was 45 or above, high on discovery skills if the score was 36 to 44, moderate to high on discovery skills if the score was between 27 to 35, moderate to low on discovery skills if the score was between 18 to 26; and low on discovery skills if the score was 17 or less (Dyer et al., 2011). The researcher-developed instrument only paralleled section one. The original Innovator's DNA Assessment included a single section, so the researcher developed sections two and three to enhance the depth and validity of the study.

The second section of the researcher's instrument was designed to assess the Business/Marketing teacher's integration of five construct groups, each representing the discovery skill teaching strategies. This included associating, questioning, observing, networking, and experimenting. The components were chosen and adjusted based off the original Innovator's DNA Self-Assessment and literature review as discussed in Chapter 2. The 35 items in total with each construct having its own set of questions were refined by expert feedback to ensure content validity:

- Associating (items 21-27)
- Questioning (items 28-33)
- Observing (items 34-40)
- Networking (items 41-46)
- Experimenting (items 47-55)

A 5-point Likert scale was used ranging from 5-Strongly agree, 4-Somewhat agree, 3-Neither agree nor disagree, 2-Somewhat disagree, and 1-Strongly disagree. Section three of the researcher's

instrument collected demographic/characteristics from Business/Marketing teachers. The data collected was (1) highest degree, (2) teacher certification, (3) race/ethnicity, (4) number of years teaching, (5) type of school, (6) state of employment, and (7) gender.

Research Implementation

A descriptive, correlational research design was chosen for this study. This study provided a quantitative, analytical description of the beliefs of the participants by electronically examining a sample of the population (Creswell & Creswell, 2018). The descriptive statistics summarized the Business/Marketing teachers perceived discovery skills (associating, questioning, observing, networking, and experimenting), while Pearson's correlation assessed relationships between perceived discovery skills and the integration of discovery skill teaching strategies in the classroom. Section one of the instrument utilized components of the original Innovator's DNA Self-Assessment (Dyer et al., 2011). The researcher only used the odd-numbered items on the original 20-item original scale to explore more of the discovery skills to provide an in-depth look at what drives an innovative mindset. .

Validity and Reliability

The basis for this study was derived from research questions in the study and the review of literature. The sections in the review of literature focused on topics such as employers need, the significance of developing disruptive innovators in curricula, and Business/Marketing Education. To ensure validity, the survey instrument was reviewed by a panel of expert panelists. These panelist consisted of university faculty members who are accomplished researchers and business educators in the field. The panel was asked to review and assist in developing a survey

that accurately displayed the purpose and scope of the study. Recommendations from the panelists were included prior to the final survey instrument being disseminated.

Reliability of the survey instrument was used to measure the internal consistency using Cronbach’s Alpha. Cronbach’s Alpha reliability coefficients scale was based on each different type of discovery skills: associating, questioning, observing, networking, and experimenting (see Table 1). The results indicated satisfactory with the internal consistency of four construct items, according to Bas (2013), who noted that Cronbach’s Alpha score should be at least .70. The associating construct did not meet internal consistency due to the limited sampling method of odd-numbered items being used.

Table 1

Discovery Skills Reliability of Scaled Items

Constructs	<i>n</i>	Cronbach’s alpha
Associating	100	.66
Questioning	100	.74
Observing	100	.78
Networking	100	.78
Experimenting	100	.78

Note: Reliability test the internal consistency.

Data Collection and Analysis

Participants were invited to participate in the researchers survey via an email (Appendix A) from the association president seeking their participation to ensure an accurate sampling frame. Permission was obtained from the Auburn University IRB prior to collecting data for this study (Appendix B). Before starting the survey, participants had to give their voluntary consent and if they acknowledged, participants were assured of their anonymity and directed to the link survey instrument. The study presented no more than a minimal risk to the participants and any

data gathered was anonymous with no personal identifying information. Once data was collected, it was stored in a secure database and was only accessed by the researcher.

The initial recruitment email was sent on June 08, 2021, to 583 SBEA participants. A reminder email was sent June 22, 2021. A third and final reminder was sent on August 17, 2021. There was a total of 111 participants who responded to the survey, for a response rate of 19.04%. However, 11 of these participants were missing more than 70% of survey information and were therefore deleted. Efforts to reduce frame error to exclude participants with missing data, 100 usable surveys of the approximate 583 potential SBEA participants were retained for data analysis at a valid response rate of 17.2% (Lindner, 2002).

The Statistical Package for Social Sciences (SPSS) version 28 was used to analyze statistical data. Descriptive statistics, including frequencies, means and standard deviations were run to summarize participants perceived discovery skills and integration of discovery skill teaching strategies in the classroom. Inferential statistics, Pearson's correlation and one-way ANOVA were run to determine relationships between perceived discovery skills, the integration of discovery skill teaching strategies in the classroom and make comparisons about teacher's perceived discovery skills and their demographics.

Data Analysis

After completing the review of literature, the researcher created a matrix (Table 2) to create items for the survey instrument. Descriptive statistics were used to analyze, organize, summarize, and describe the collected data. First, the frequency of Business/Marketing teachers' perception of their discovery skills level were examined. Next, the frequency for integrating discovery skill teaching strategies in the classroom were examined. Next, the correlation between teachers perceived discovery skills level and the extent of integrating discovery skill teaching

strategies in the classroom were examined. Lastly, a one-way ANOVA was used to make comparisons about teacher's perceived discovery skills and their demographics.

Table 2

Research Survey Questions and Statistical Tests Matrix

Research Question	Survey Questions	Statistical Test
1. What is the perceived level of a Business/Marketing teachers' discovery skills?	1, 3, 5, 7, 9, 11, 13, 15, 17, 19	Descriptive Statistics
2. To what extent are Business/Marketing teachers integrating discovery skill activities in the classroom?	21-55	Descriptive Statistics
3. Is there a correlation between the level of a Business/Marketing teachers perceived discovery skill and the extent to which Business/Marketing teachers are integrating discovery skill activities in the classroom?	1, 3, 5, 7, 9, 11, 13, 15, 17, 19 and 21-55	Correlation
4. Do differences exist among Business/Marketing teachers perceived discovery skills and the following demographics: (a) highest degree, (b) teacher certification, (c) race/ethnicity, (d) number of years teaching, (e) type of school, (f) state of employment, and (g) gender?	1, 3, 5, 7, 9, 11, 13, 15, 17, 19 and 56-62	One-way ANOVA,

Research Question 1: What is the perceived level of a Business/Marketing teachers' discovery skills?

Descriptive statistics were used to determine the frequency of Business/Marketing teachers' perception of their discovery skills.

Research Question 2: To what extent are Business/Marketing teachers integrating discovery skill teaching strategies in the classroom?

Descriptive statistics were used to determine the frequency of integrating discovery skill teaching strategies in the classroom.

Research Question 3: Is there a correlation between the level of a Business/Marketing teachers perceived discovery skills and the extent to which Business/Marketing teacher are integrating discovery skill teaching strategies in the classroom?

The Pearson correlation was used to analyze Research Question 3. The Pearson correlation measures the degree and direction of the linear relationship between two variables. A -1 correlation means negative linear relationship, 0 correlation means no linear relationship, and +1 correlation means positive linear relationship.

Research Question 4: Do differences exist among Business/Marketing teachers' perceived discovery skills and their demographics such as (highest degree, teacher certification, race/ethnicity, number of years teaching, type of school, state of employment, and gender)?

Research Question 4 was analyzed using one-way ANOVA to determine whether there are any statistically significant differences between unrelated groups.

Summary

The objective of this study was to determine whether disruptive innovators are being prepared in the middle/junior high, secondary, and postsecondary in Business/Marketing Education classrooms. Descriptive statistics, the Pearson correlation, and one-way ANOVA were used to analyze the results of the Innovation Skills Survey. The survey instrument consisted of five-point Likert-type scales to determine the agreement and frequency of several questions and

statements related to discovery skills. An understanding of the discovery skills for teachers and students were explored. The following chapter will report the statistical analysis and results of this research study.

CHAPTER IV: STATISTICAL ANALYSIS AND RESULTS

This chapter consists of the following major topics:

Introduction and Restatement of the Problem

Descriptive Analysis

Discussion of Research Questions

Summary

Introduction and Restatement of the Problem

The purpose of the study was to investigate whether disruptive innovators are being prepared in middle/junior high, secondary, and postsecondary Business/Marketing Education classrooms. This study investigated the following: (a) the perceived level of Business/Marketing teacher's discovery skills, (b) the extent that Business/Marketing teachers are integrating discovery skill teaching strategies in the classroom, (c) the correlation between the level of a Business/Marketing teachers perceived discovery skills and the extent to which Business/Marketing teacher are integrating discovery skill teaching strategies in the classroom, and (d) the differences among Business/Marketing teachers perceived discovery skills level and their demographics/characteristics (highest degree, teacher certification, race/ethnicity, number of years teaching, type of school, state of employment, and gender).

For this study, an email was sent (Appendix A) from the association president seeking participation from all Southern Business Education Association (SBEA) members across twelve states to complete the electronic survey. Of 583 surveys emailed to Southern Business Education Association members, 100 Business/Marketing teachers completed the study which was a return rate of 17.2%.

Descriptive and statistical analyses were used to analyze, organize, summarize, and describe the collected data for each of the three research questions. First, the frequency of Business/Marketing teachers' perception of their discovery skills level were examined. Next, the frequency for integrating discovery skill teaching strategies in the classroom were examined. Next, the correlation between teachers' perceived discovery skills level and the extent of integrating discovery skill teaching strategies in the classroom were examined. Lastly, a one-way ANOVA was used to make comparisons about teacher's perceived discovery skills and their demographics. Table 3 is a description of the participants in this study. The highest number of participants held a master's degree (52%) and (46%) of participants indicated having a class A certification. The largest percentage of participants by race/ethnicity were identified as White or Caucasian (67%). Of the total number of participants, (35%) percent of the participants indicated having 11-15 years of teaching experience, and (60%) indicated having teaching experience or having experience teaching in a secondary school setting. The majority of participants who completed the survey reported Alabama as their state of employment (31%). Most of the participants were female (64%).

Table 3

Demographic Data of Participants

Categories	<i>n</i>	%
Highest Level of Degree		
Bachelor's Degree	10	10
Master's Degree	52	52
Education Specialist Degree	21	21
Doctorate	14	14
Prefer not to answer	3	3

Table 3 (continued).

Categories	<i>n</i>	%
Type of Certification		
Class B (Bachelor's)	10	10
Class A (Master's)	46	46
Class AA (Ed Specialist or Sixth Year TEC)	29	29
Other (CTE Equivalent Certification)	15	15
Years of Experience		
0-5 Years	17	17
6-10 Years	21	21
11-15 Years	35	35
20+ Years	27	27
Type of School		
Middle/Junior High 6-8	15	15
High School 9-12	60	60
Post-Secondary	16	16
Prefer not to answer	9	9
Southern Business Education Association States		
Alabama	31	31
Arkansas	4	4
Florida	7	7
Georgia	17	17
Kentucky	6	6
Louisiana	4	4
Mississippi	7	7
North Carolina	4	4
South Carolina	5	5
Tennessee	7	7
Virginia	8	8
Gender		
Male	35	35
Female	64	64
Prefer not to answer	1	1

Note. *n* = 100

Descriptive Analysis

Discussion of Research Questions

Research Question 1: What is the perceived level of Business/Marketing teachers' discovery skills?

The discovery skills overall mean, range, and standard deviation scores reported by Business/Marketing teachers indicated (see Table 4) were Associating ($M = 2.47, SD = .89$), Questioning ($M = 2.55, SD = .89$), Observing ($M = 2.68, SD = .82$), Networking ($M = 2.98, SD = .92$), and Experimenting ($M = 2.63, SD = .83$). The average mean score for discovery skills was ($M = 2.66, SD = .87$) suggesting that, on average, participants viewed themselves as rarely engaging in innovative thinking. This finding reflects a moderate to low-self-perception of innovative thinking. If teachers do not believe in themselves to teach the students discovery skills, the preparation for middle/junior high, secondary, and postsecondary students to become disruptive innovators will be delayed.

This section utilized a five-point Likert scale (1-5) indicating the level of agreement or disagreement with statements regarding the participants perception as a disruptive innovator. To score the survey, the odd-numbered items values fall between 1 and 5 which were to only measure discovery skills. The Likert responses scored 1-5 were added together for multiple items resulting in a composite score.

Table 4*Teacher's Perceived Discovery Skills*

Teacher Discovery Skills	Mean	Min - Max	Std. Dev
Associating	2.47	1.00 - 4.50	0.89
Questioning	2.55	1.00 - 4.50	0.89
Observing	2.68	1.00 - 4.50	0.82
Networking	2.98	1.00 - 5.00	0.92
Experimenting	2.63	1.00 - 4.50	0.83

Note: Rated using a Likert-type scale: 5-Strongly Agree, 4-Somewhat Agree, 3-Neither Agree or Disagree, 2-Somewhat Disagree, and 1-Strongly Disagree.

While Table 4 indicates individual Likert-scale ranging from 1-5, Table 5 shows the summary of combining the odd-numbered items (discovery skills) to create an overall composite score. The participants were categorized into five levels of innovate thinking: score of 45 or above was considered very high on discovery skills indicating frequent engagement in innovate thinking, scores between 36 to 44 was considered high indicating occasional to frequent engagements in innovative thinking, scores between 27 to 35 was considered moderate to high engagement, indicating lower frequent engagement of innovative thinking, 18 to 26 was considered moderate to low on discovery skills indicating rare engagement in innovative thinking, and scores between 17 or less was considered low on discovery skills indicating no engagement in innovative thinking (Dyer et al., 2011). The overall highest composite scores for Business/Marketing teachers discovery skills indicated moderate to low (n = 52) and moderate to high (n = 39) self-perception of innovative thinking. This composite score suggests that participants rarely engage in innovative thinking, demonstrating moderate to high and moderate to low engagement in creativity and disruptive thinking.

Table 5*Teachers' Perceived Discovery Skills Composite Scores*

Teacher Discovery Skills	<i>n</i>	Range
Very High	0	45 >
High	6	36-44
Moderate to High	39	27-35
Moderate to Low	52	18-26
Low	3	17 <

Note: n = 100.

To analyze the perceived level of discovery skills of the participants, frequencies were conducted. The independent variables for this research question were discovery skills, and the dependent variables were the level of agreements. Participants were asked to rank their perceived level of agreement on a five-point Likert scale. The scale was indicated by the following levels: 5-Strongly agree, 4-Somewhat agree, 3-Neither agree nor disagree, 2-Somewhat disagree, and 1-Strongly disagree. The questions grouped in the survey instrument aligned according to the respective discovery skills.

The top discovery skills indicated by participants (see Table 6) were networking with the highest percentage (55%) of “Strongly agree” ‘I attend conferences (on my areas of expertise as well as unrelated areas) to network and understand what issues they are facing’ followed by observing at (56%) of “Somewhat agree” where participants reported ‘I often find solutions to problems by drawing on solutions or ideas developed in other classrooms or other disciplines. Although there was a slightly higher share at (56%) for the highest level of agreement ‘Somewhat agree’, participants indicated strong overall at (55%) which is the highest possibility on the scale. Participants self-reported feeling confident in their ability to leverage their

discovery skills surrounding networking and observing as they reported actively participating in conferences and finding solutions or ideas developed to stay up to date in their field.

Table 6

Teachers Perceived Discovery Skills Responses

Total Number of Participant Responses for each Perceived Level of Agreement	5 Strongly Agree <i>n</i> (%)	4 Somewhat Agree <i>n</i> (%)	3 Neither Agree or Disagree <i>n</i> (%)	2 Somewhat Disagree <i>n</i> (%)	1 Strongly Disagree <i>n</i> (%)
Associating Frequently, my ideas or perspectives diverge radically from other's perspectives.	16 (16%)	32 (32%)	21 (21%)	23 (23%)	8 (8%)
Questioning I regularly ask questions that challenge the status quo.	21 (21%)	47 (47%)	19 (19%)	13 (13%)	0 (0%)
I frequently Ask "what if" questions that provoke exploration of new possibilities.	34 (34%)	48 (48%)	11 (11%)	7 (7%)	0 (0%)
Observing New ideas often come to me when I am directly observing how teachers interact with students.	35 (35%)	45 (45%)	12 (12%)	7 (7%)	0 (0%)
I often find solutions to problems by drawing on solutions or ideas developed in other classrooms or other disciplines.	24 (24%)	56 (56%)	15 (15%)	3 (3%)	2 (2%)

Table 6 (continued).

Total Number of Participant Responses for each Perceived Level of Agreement	5 Strongly Agree <i>n</i> (%)	4 Somewhat Agree <i>n</i> (%)	3 Neither Agree or Disagree <i>n</i> (%)	2 Somewhat Disagree <i>n</i> (%)	1 Strongly Disagree <i>n</i> (%)
I actively seek to identify emerging trends by reading books, articles, magazines, blogs, and so on.	42 (42%)	44 (44%)	9 (9%)	3 (3%)	2 (2%)
I regularly observe the teaching strategies of fellow teachers to get new ideas.	31 (31%)	49 (49%)	2 (12%)	6 (6%)	2 (2%)
Networking I regularly talk with a diverse set of people (e.g., community stakeholders, parents) to find and refine new ideas.	31 (31%)	48 (48%)	10 (10%)	9 (9%)	2 (2%)
I attend conferences (on my areas of expertise as well as unrelated areas) to network and understand what issues they are facing.	55 (55%)	33 (33%)	7 (7%)	3 (3%)	2 (2%)
Experimenting I frequently experiment to create new ways of doing things in the classroom.	34 (34%)	53 (53%)	7 (7%)	2 (2%)	2 (2%)

Note. *n*=100

Research Question Two

To what extent are Business/Marketing teachers' integrating discovery skills

teaching strategies in the classroom? Cronbach's Alpha was calculated to be 0.66 ($\alpha = .66$) for Associating, 0.82 ($\alpha = .82$) for Questioning, 0.79 ($\alpha = .79$) for Observing, 0.76 ($\alpha = .76$) for Networking and 0.78 ($\alpha = .78$) for Experimenting. The discovery skills were grouped by associating (survey questions 21-27), questioning (survey questions 28-33), observing (survey questions 34-40), networking (survey questions 41-46), and experimenting (survey questions 47-55). Associating is defined as connecting unrelated thoughts and bringing them together for the purpose of creating something new or sustaining, questioning is defined as asking thought-provoking questions to gain better insight for creativity, observing is defined as the watch and see approach, networking is defined as learning new ways of doing things, and experimenting is defined as looking at future outcomes and how one can capitalize on them (Dyer et al., 2011).

The independent variable in this research question is discovery skills, and the dependent variable is the discovery skills teaching strategies. To analyze this research question, the frequency of each discovery skill was conducted to determine the Business/Marketing teacher's integration of discovery skill teaching strategies in the classroom.

Associating

The top teaching strategies indicated by participants at (36%) was 'Students have open class discussions about a particular topic or subject' which was 'always' integrated followed by (60%) reported 'very often' for 'Students address issues that will generate a good outcome'. Teachers self-reported feeling comfortable allowing students to have open discussions while embracing diverse perspectives that produce an outcome to ensure students have an understanding that it is appropriate to have a difference of opinion. This demonstrates that these self-reported statements were higher on integration in the classroom and students having the opportunity voice their opinions without being afraid.

The bottom teaching strategy indicated by participants at (13%) was ‘Students explore topics not directly related to the subject I teach’ which was ‘rarely’ integrated. Participants self-reported feeling less confident allowing students to explore topics they themselves do not teach. Participants understanding the importance of exploration helps students look at things differently and beyond what they already know.

Questioning

The top teaching strategies indicated by participants at (54%) was ‘Students ask questions in my classroom on a regular basis’ which was ‘always’ integrated followed by (61%) reported ‘very often’ for ‘Students synthesize information to make decisions’. Teachers self-reported feeling confident in creating teaching strategies that allow students to engage in the lessons and synthesize information to make informed decisions.

The bottom teaching strategy indicated by participants at (12%) was ‘Students select topics on their own to learn about’ which was ‘rarely’ integrated. Participants self-reported being unsure when integrating teaching strategies that allow students to take ownership of topics they are interested in. Becoming a disruptive innovator involves risk and teachers creating spaces for students to take ownership of their own learning. Spaces that support positivity enhance learning, increase wondering, and allows assistance to be provided.

Observing

The top teaching strategies indicated by participants at (29%) was ‘Students use real-world situations that are significant to generate a new idea’ followed by (52%) reported ‘very often’ for ‘Students observe before making a decision’. Participants reported feeling capable in allowing students to use real-world situations and observation before making decisions. This indicated that teachers understand the importance of students reflecting on current issues in the

world today. The reality is that some situations portray a false narrative which then allows students to observe and make decisions on what they observe.

The bottom teaching strategies indicated by participants at (34%) was ‘Students shadow others in environments not familiar to them’ which was ‘rarely’ integrated followed by (26%) reported ‘rarely’ for ‘Students role play environments they observe’. Participants reported being less capable in allowing students to shadow and role play in environments not familiar to them. This demonstrates that for participants of this study, students do not get the opportunity to connect classroom methodology to practical application. For students to become disruptors, they must observe in order to gain information and be aware of what they are observing and recording to reflect on what they are observing that might be unfamiliar to them.

Networking

The top teaching strategies indicated by participants at (15%) was ‘Students network with students from other disciplines’ followed by (52%) reported ‘very often’ for ‘Students increase their collaborative efforts to learn new things’. Participants reported feeling competent in their ability to network with students from other disciplines and collaborating to learn new things. This demonstrates teachers understand the power of connection. Additionally, teachers understand that in order to diversify learning, students need the opportunity to share their thoughts and input which gives them a sense of belonging with an engaged mindset.

The bottom teaching strategy indicated by participants at (29%) was ‘Students network with students from other countries’ which was ‘never’ integrated. Participants reported feeling inadequate facilitating students networking with students from other countries. This demonstrates the current delivery of education may not reflect a forward-thinking mindset. Globalization cannot be taught on the local educational level if teachers are inadequately

preparing students for the global workforce and to compete globally. To develop, students need access to other perspectives to have a disruptive mindset.

Experimenting

The top teaching strategies indicated by participants at (39%) was ‘Students have a safe place to take risk’ followed by (66%) ‘very often’ for ‘Students demonstrate understanding of a concept utilizing scenarios’. Participants reported feeling proficient with providing students a safe place to take risks and facilitating opportunities for students to demonstrate understanding of concepts by using scenarios. This demonstrates that teachers can create an environment where students feel comfortable. Teachers can welcome discussions and mistakes/retakes of what students are being taught. Teachers can allow students to demonstrate their ability to make good decisions.

The bottom two strategies indicated by participants at (5%) was ‘Students participate in student led organizations’ and ‘Students select less restrictive spaces that do not threaten their freedom of design’ which was ‘rarely’ integrated. Participants reported feeling indifferent in allowing students to participate in student led organizations and less restrictive spaces that do not threaten freedom of design. This demonstrates that in some school systems, teachers may not have the opportunity to facilitate co-curricular teaching strategies. While student led organizations and less restrictive spaces may reflect not being implemented, this may be due to challenges of activities outside of the classroom and lack of ample space. Table 7 represents each specific activity relating to the participants frequency of integrating the discovery skills into instruction.

Table 7*Teachers Discovery Skills Teaching Strategies*

Discovery Skills Teaching strategies	Always <i>n</i> (%)	Very Often <i>n</i> (%)	Sometimes <i>n</i> (%)	Rarely <i>n</i> (%)	Never <i>n</i> (%)
Associating					
Students explore topics not directly related to the subject I teach.	19 (19%)	28 (28%)	38 (38%)	13 (13%)	1 (1%)
Students take ownership of their own learning.	25 (25%)	47 (47%)	26 (26%)	0 (0%)	0 (0%)
Students collaborate with each other on projects.	18 (18%)	59 (59%)	20 (20%)	2 (2%)	0 (0%)
Students have open class discussions about a particular topic or subject.	36 (36%)	41 (41%)	19 (19%)	3 (3%)	1 (1%)
Students address issues that will generate a good outcome.	15 (15%)	60 (60%)	22 (22%)	1 (1%)	1 (1%)
Students have the opportunity to express one's feelings in a productive way.	34 (34%)	46 (46%)	6 (6%)	0 (0%)	0 (0%)

Table 7 (continued).

Discovery Skills	Always		Very Often		Sometimes		Rarely		Never	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Questioning										
Students ask questions in my classroom on a regular basis.	54	(54%)	37	(37%)	7	(7%)	2	(2%)	0	(0%)
Students select topics on their own to learn about.	6	(6%)	30	(30%)	50	(50%)	12	(12%)	1	(1%)
Students research new ideas and present their findings to their peers.	9	(9%)	44	(44%)	40	(40%)	6	(6%)	1	(1%)
Students seek ways to gain an understanding about a new idea.	13	(13%)	49	(49%)	35	(35%)	3	(3%)	0	(0%)
Students synthesize information to make decisions.	10	(10%)	61	(61%)	26	(26%)	3	(3%)	0	(0%)
Students use reflective thinking to solve problems.	14	(14%)	55	(55%)	25	(25%)	6	(6%)	0	(0%)

Table 7 (continued).

Discovery Skills	Always		Very Often		Sometimes		Rarely		Never	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Observing										
Students observe before making a decision.	7	(7%)	52	(52%)	37	(37%)	4	(4%)	0	(0%)
Students explore in my classroom to improve a common process.	14	(14%)	49	(49%)	30	(30%)	5	(5%)	2	(2%)
Students create their own space for learning.	12	(12%)	39	(39%)	36	(36%)	9	(9%)	2	(2%)
Students shadow others in environments not familiar to them.	8	(8%)	28	(28%)	27	(27%)	34	(34%)	3	(3%)
Students role Play environments they observe.	4	(4%)	32	(32%)	34	(34%)	26	(26%)	4	(4%)
Students use real-world situations that are significant to generate a new idea.	29	(29%)	47	(47%)	21	(21%)	2	(2%)	0	(0%)
Students reflect after daily teaching strategies.	17	(17%)	39	(39%)	38	(38%)	5	(5%)	1	(1%)

Table 7 (continued).

Discovery Skills	Always		Very Often		Sometimes		Rarely		Never	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Networking										
Students network with students from other disciplines.	15	(15%)	29	(29%)	42	(42%)	12	(12%)	2	(2%)
Students network with students from other countries.	7	(7%)	16	(16%)	18	(18%)	30	(30%)	29	(29%)
Students engage with outside speakers.	4	(4%)	36	(36%)	45	(45%)	13	(13%)	2	(2%)
Students visit businesses/industries for career exploration.	10	(10%)	33	(33%)	35	(35%)	15	(15%)	7	(7%)
Students apply their skills and knowledge in external settings.	13	(13%)	42	(42%)	32	(32%)	9	(9%)	4	(4%)
Students increase their collaborative efforts to learn new things.	13	(13%)	52	(52%)	29	(29%)	5	(5%)	0	(0%)

Table 7 (continued).

Discovery Skills	Always		Very Often		Sometimes		Rarely		Never	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Experimenting										
Students have the flexibility to explore new ideas.	36	(36%)	47	(47%)	14	(14%)	3	(3%)	0	(0%)
Students participate in workforce readiness teaching strategies.	30	(30%)	44	(44%)	20	(20%)	3	(3%)	3	(3%)
Students participate in student led organizations.	21	(21%)	49	(49%)	23	(23%)	5	(5%)	2	(2%)
Students have a safe place to take risk.	39	(39%)	48	(48%)	11	(11%)	1	(1%)	0	(0%)
Students demonstrate understanding of a concept utilizing scenarios.	20	(20%)	66	(66%)	12	(12%)	1	(1%)	0	(0%)
Students have a space to revise their way of thinking.	33	(33%)	47	(47%)	20	(20%)	0	(0%)	0	(0%)
Students are given tasks that create innovation.	25	(25%)	60	(60%)	14	(14%)	1	(1%)	0	(0%)

Table 7 (continued).

Discovery Skills	Always		Very Often		Sometimes		Rarely		Never	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Students select less restrictive spaces that do not threaten their freedom of design.	22	(22%)	43	(43%)	30	(30%)	5	(5%)	0	(0%)
Students are driven by the ability to openly explore opportunities for growth.	21	(21%)	50	(50%)	26	(26%)	1	(1%)	0	(0%)

Note: Rated using a Likert-type scale: 5-Always, 4-Very Often, 3-Sometimes, 2-Rarely, and 1-Never.

The options on the five-point Likert-type scale were 5-Always, 4-Very often, 3-Sometimes, 2-Rarely, and 1-Never. Overall, results indicated that Business/Marketing teachers integrated the discovery skill teaching strategies “sometimes”, on average ($M = 3.72$, $SD = .54$). Also, the results revealed that participants’ knowledge base plays a vital role in preparing students to be disruptors. Presenting opportunities that are practical with applied learning will help students gain the innovative trajectory. Occasional integration of discovery skills may delay the effectiveness of understanding the dynamics of being a disruptor. With practical experience, teachers can relate to the students’ lives, engage natural curiosity, and use assessments that measure accomplishments for workforce matriculation.

Integrating classroom teaching strategies that help students become disruptors results in their ability to seek and understand. This new information can lead students to make better

decisions for their own lives and cultivate a value contributing to society. Student and teacher relationships form by understanding how students learn which can mean rejecting traditional lecture-based instruction and integrating challenges to facilitate students critical thinking. Students can grasp the most relevant information when they are aware that teachers understand their individuality. Table 8 shows the Business/Marketing teachers' integration of discovery skill teaching strategies mean scores.

Table 8

Discovery Skills Teaching Strategies Mean Scores

Teaching Strategies Discovery Skills	Mean	Std. Dev
Associating	3.94	0.47
Questioning	3.72	0.50
Observing	3.30	0.64
Networking	3.64	0.60
Experimenting	4.01	0.48

Note: Rated using a Likert-type scale: 5-Always, 4-Very Often, 3-Sometimes, 2-Rarely, and 1-*Never.*

Research Question Three

Is there a correlation between the level of a Business/Marketing teachers' perceived discovery skills and the extent to which Business/Marketing teachers' are integrating discovery skill teaching strategies in the classroom?

A Pearson correlation was conducted to analyze the linear relationship between teachers' perceived discovery skills and their integration of the discovery skill teaching strategies in the classroom. There were two statistically significant correlations identified. The results showed

associating strategies were positively correlated with discovery skill observing ($r = .245, p = .014$). This demonstrates that teachers who frequently integrate strategies related to associating tend to have higher observing skills. Second, questioning strategies were positively correlated with discovery skill observing ($r = .249, p = .013$). This demonstrates that teachers who frequently integrate strategies related to questioning tend to have higher observing skills. The remaining variables were non significant indicating that discovery skill strategies were not associated with any other discovery skills. Overall, the observing skill is the only skill related to any of the discovery skill strategies. This indicates that teachers who are inquisitive (questioning) or connect unrelated ideas (associating) are more aware of their surroundings. Table 9 presents the findings of the study derived from the data previously discussed. The column numbers represent discovery skill strategies, and the row numbers represent the discovery skills.

Table 9

Pearson Correlation Between Discovery Skill Strategies and Discovery Skills

Discovery Skills	Associating Skill	Questioning Skill	Observing Skill	Networking Skill	Experimenting Skill
Associating Strategy	$r = -0.101$ $p = 0.317$	$r = -0.002$ $p = 0.986$	$r = .245^*$ $p = 0.014$	$r = 0.181$ $p = 0.071$	$r = 0.073$ $p = 0.469$
Questioning Strategy	$r = -0.034$ $p = 0.740$	$r = 0.054$ $p = 0.596$	$r = .249^*$ $p = 0.013$	$r = 0.189$ $p = 0.060$	$r = 0.057$ $p = 0.571$
Observing Strategy	$r = 0.002$ $p = 0.982$	$r = 0.052$ $p = 0.607$	$r = 0.117$ $p = 0.247$	$r = 0.111$ $p = 0.273$	$r = 0.122$ $p = 0.227$
Networking Strategy	$r = -0.093$ $p = 0.355$	$r = 0.064$ $p = 0.527$	$r = 0.059$ $p = 0.559$	$r = 0.018$ $p = 0.858$	$r = 0.116$ $p = 0.249$
Experimenting Strategy	$r = 0.003$ $p = 0.977$	$r = 0.151$ $p = 0.134$	$r = 0.164$ $p = 0.103$	$r = 0.106$ $p = 0.295$	$r = 0.127$ $p = 0.209$

Note: $n = 100$. Column variables denote discovery skills strategies while row variables denote discovery skills. * Correlation is significant at the 0.05 level. **Correlation is significant at the 0.01 level

Research Question Four

Do differences exist among Business/Marketing teachers' perceived discovery skills and the following demographics: (a) highest degree, (b) teacher certification, (c) race/ethnicity, (d) number of years teaching, (e) type of school, (f) state of employment, and (g) gender.

Business/Marketing teachers had to rate their perceived level of discovery skills with a five-point Likert-type scale. The options were 5-Strongly agree, 4-Somewhat agree, 3-Neither agree or disagree, 2-Somewhat disagree, and 1-Strongly disagree. The Means (M) and Standard Deviations (SD) of items measuring Business/Marketing teachers' highest perception of discovery skills and demographics: (a) Doctorate ($M = 2.77$, $SD = .52$), (b) Class B (Bachelor's) ($M = 2.73$, $SD = .49$), (c) Black or African American ($M = 2.89$, $SD = .60$), (d) 0-5 years ($M = 2.87$, $SD = .58$), (e) Postsecondary ($M = 2.86$, $SD = .72$), (f) Florida ($M = 2.86$, $SD = .56$), and (g) Male ($M = 2.74$, $SD = .52$).

Examining the mean scores for each category for the highest level of degree, participants who reported having a doctorate ($M = 2.77$, $SD = .52$) reported higher level of confidence in discovery skills. However, when looking at certification as a category, more teachers had a higher perception of discovery skills when they had a class B certification ($M = 2.73$, $SD = .49$). Having a bachelor's degree indicated a difference as compared to having a certificate. It also demonstrates that different participants selected the doctoral survey option and different participants selected the class B certification survey option; perhaps due to no certification for the doctorate, the participants answered the questions presented.

Next, examining the mean scores for race/ethnicity, this indicated that Black or African American ($M = 2.89$, $SD = .60$) participants reported having higher confidence in discovery skills

compared to Whites or Caucasian participants. This may be due to the sample size and the number of Blacks who are SBEA members that completed the survey. The majority of the SBEA participants identified as White or Caucasian. Furthermore, examining the mean scores for years of experience, this indicated that participants with 0-5 years ($M = 2.87, SD = .58$) reported having higher confidence in discovery skills. However, when looking at type of school as a category, more teachers indicated they work at the postsecondary level ($M = 2.86, SD = .72$). This demonstrates that perhaps teachers with less experience and teachers who teach on the postsecondary level have resources that provide opportunities to increase their awareness of discovery skills.

Continuing to examine the mean scores for state of employment indicated that participants from Florida ($M = 2.86, SD = .56$) had higher confidence in discovery skills. However, Alabama was a close second, indicating teachers had higher confidence in discovery skills. This demonstrates that perhaps teachers in Florida and Alabama have more opportunities to increase their discovery skill perception. Finally, examining the mean scores for gender, indicated that male teachers ($M = 2.74, SD = .52$) reported having higher confidence in discovery skills compared to females. This may be due to sample size and the number of male teachers who are SBEA members and completed the survey, but more female teachers are SBEA members. Table 10 presents the findings of the study derived from the data previously discussed.

Table 10*Participants Discovery Skills Based on Demographics*

Categories	<i>n</i>	<i>M (SD)</i>
Highest Level of Degree		
Bachelor's Degree	10	2.72 (.52)
Master's Degree	52	2.64 (.55)
Education Specialist Degree	21	2.60 (.60)
Doctorate	14	2.77 (.52)
Type of Certification		
Class B (Bachelor's)	10	2.73 (.49)
Class A (Master's)	46	2.65 (.48)
Class AA (Ed Specialist or Sixth Year TEC)	29	2.66 (.62)
Other (CTE Equivalent Certification)	14	2.46 (.70)
Race/Ethnicity		
Black or African American	28	2.89 (.60)
White or Caucasian	67	2.56 (.52)
Other	5	2.50 (.26)
Years of Experience		
0-5 Years	17	2.87 (.58)
6-10 Years	21	2.58 (.49)
11-15 Years	35	2.63 (.59)
20+ Years	27	2.66 (.55)
Other	5	2.50 (.26)
Type of School		
Middle/Junior High 6-8	15	2.60 (.45)
High School 9-12	60	2.71 (.70)
Postsecondary	16	2.86 (.72)
State of Employment		
Alabama	31	2.85 (.63)
Arkansas	4	2.61 (.91)
Florida	7	2.86 (.56)
Georgia	17	2.44 (.44)
Kentucky	6	2.37 (.67)
Louisiana	4	2.60 (.22)
Mississippi	7	2.69 (.50)
North Carolina	4	2.48 (.33)
South Carolina	5	2.38 (.24)
Tennessee	7	2.74 (.51)
Virginia	8	2.66 (.41)

Table 10 (continued).

Gender			
Female		64	2.62 (.57)
Male		35	2.74 (.52)

Note: Rated using a Likert-type scale: 5-Strongly Agree, 4-Somewhat Agree, 3-Neither Agree or Disagree, 2-Somewhat Disagree, and 1-Strongly Disagree.

A one-way ANOVA was conducted to examine group differences in the perception of Business/Marketing teachers' discovery skills and their demographics, Table 11 represents the independent variables analyzed. The results were not statistically significant among group differences in perceived discovery skills based on highest degree $F(3,93) = .33, p = .81$, type of certification $F(5,90) = .36, p = .88$, race/ethnicity $F(4,95) = 2.04, p = .09$, years teaching $F(3,96) = 1.09, p = .36$, school type $F(2,88) = 1.53, p = .22$, state of employment $F(10,89) = 1.13, p = .35$, or gender $F(1,97) = 1.18, p = .28$. This indicated that regardless of their demographic background, the participants' perception of discovery skills was consistent across groups with similar viewpoints.

Table 11*One-Way ANOVA Statistical Analysis Results*

Categories	<i>F</i>	<i>df</i>	<i>p</i>
Highest Level of Degree	.33	3, 93	.81
Type of Certification	.36	5, 90	.88
Race/Ethnicity	2.04	4, 95	.09
Years of Experience	1.09	3, 96	.36
Type of School	1.53	2, 88	.22
State of Employment	1.13	10, 89	.35
Gender	1.18	1, 97	.28

Note: $n = 100$ $p > .01$

Summary

This chapter presented data that was analyzed to identify Business/Marketing teachers' perceived discovery skills, the integration of discovery skill teaching strategies in the classroom, the correlation between the level of a Business/Marketing teachers' perceived discovery skills, and the extent to which the Business/Marketing teachers' integrate discovery skill teaching strategies in the classroom, and if differences exist among Business/Marketing teachers' perceived discovery skills and the following demographics: (a) highest degree, (b) teacher certification, (c) race/ethnicity, (d) number of years teaching (e) type of school, (f) state of employment, and (g) gender. The results of the study found that the Business/Marketing teachers surveyed rated their perceived discovery skills level as moderate to low ($n = 52$) and moderate high ($n = 39$).

The top discovery skills perception indicated by participants was networking with the highest percentage (55%) of 'Strongly agree' 'I attend conferences (on my areas of expertise as well as unrelated areas) to network and understand what issues they are facing' followed by observing at (56%) of 'Somewhat agree' where participants reported 'I often find solutions to problems by drawing on solutions or ideas developed in other classrooms or other disciplines.

According to the results of the discovery skill teaching strategies , the top teaching strategies for associating indicated by participants at (36%) was 'Students have open class discussions about a particular topic or subject' which was 'always' integrated followed by (60%) reported 'very often' for 'Students address issues that will generate a good outcome'. The top teaching strategies for questioning indicated by participants at (54%) was 'Students ask questions in my classroom on a regular basis' which was 'always' integrated. The top teaching strategies for observing indicated by participants at (29%) was 'Students use real-world situations that are

significant to generate a new idea' followed by (52%) reported 'very often' for 'Students observe before making a decision'. The top teaching strategies for networking indicated by participants at (15%) was 'Students network with students from other disciplines' followed by (52%) reported 'very often' for 'Students increase their collaborative efforts to learn new things'. Lastly, the top teaching strategies for experimenting indicated by participants at (39%) was 'Students have a safe place to take risk' followed by (66%) 'very often' for 'Students demonstrate understanding of a concept utilizing scenarios'.

The Pearson correlation for discovery skill questioning revealed a statistically significant positive correlation between the perception of teachers' discovery skills and the extent of integration, ($r = .20, p < .05$). This demonstrates that as participants' confidence increases for the discovery skill questioning, participants will increase the integration of questioning teaching strategies in the classroom. Next, the integration of the discovery skill observing indicated a positive correlation and weak relationship between the teacher's perceived discovery skills, ($r = .13, p = .19$). This demonstrated that the integration of the discovery skill observing in the classroom and participants self-perception have no discernible difference between them. The positive correlation and weak relationship indicated that the teacher's capability to observe new things, create new ideas, and integrate these new ideas in the classroom is not revealed by the results of this study.

However,, analysis revealed that the integrating discovery skill networking had no relationship with Business/Marketing teachers' perception of having discovery skills. There was not a significant group difference in the discovery skills compared to the independent variables analyzed: highest degree, teacher certification, race/ethnicity, number of years teaching, type of school, state of employment, and gender.

Also, the integration of the discovery skill experimenting indicated a positive correlation and weak relationship between teacher's perceived discovery skills, ($r = .18, p = .07$). This demonstrates that the integration of the discovery skill experimenting in the classroom and the teacher's perception have no discernible difference between them. The positive correlation and weak relationship indicated that the teacher's confidence to explore new opportunities and integrate them in the classroom is not revealed by the results of this study.

Lastly, the integration of the discovery skill associating indicated a positive correlation and weak relationship between teacher discovery skills, ($r = .17, p = .10$). This demonstrates that the integration of the discovery skill associating in the classroom and the teacher's perception have no discernible difference between them. The positive correlation and weak relationship indicated that the teacher's capability to associate unrelated topics and integrate them in the classroom is not revealed by the results of the study.

CHAPTER 5

SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Introduction

Employers recognize innovation as a crucial trait in employees (Mumtaz & Parahoo, 2019). Understanding teaching strategies that assist in developing disruptive innovators is an essential component to improving Business/Marketing Education curriculum and ultimately better preparing students for jobs focused on disruptive innovation. Organizations desire employees that assist the organization with adaptation to the changing trends of the market (Jones, 2019). Changes in the workforce are constant and preparing the next generation of workers is critical (GrayLine Group, 2018). The purpose of the study was to investigate whether disruptive innovators are being prepared in middle/junior high, secondary, and

postsecondary Business/Marketing Education classrooms. This study investigated the following: (a) the perceived level of Business/Marketing teacher's discovery skills, (b) the extent that Business/Marketing teachers are integrating discovery skill teaching strategies in the classroom, (c) the correlation between the level of a Business/Marketing teachers perceived discovery skills and the extent to which Business/Marketing teacher are integrating discovery skill teaching strategies in the classroom, and (d) the differences among Business/Marketing teachers perceived discovery skills level and their demographics (highest degree, teacher certification, race/ethnicity, number of years teaching, type of school, state of employment, and gender).

In the previous chapter, data collected from Business/Marketing teachers who were members of the Southern Business Education Association (SBEA) using the Innovative Skills Survey (ISS) instrument were analyzed and presented. This chapter includes a discussion of the findings, conclusions of the study, and recommendations.

Research Questions

The following research questions were used in this study:

1. What is the perceived level of Business/Marketing teachers' discovery skills?
2. To what extent are Business/Marketing teachers integrating discovery skill teaching strategies in the classroom?
3. Is there a correlation between the level of Business/Marketing teachers' perceived discovery skills and the extent to which Business/Marketing teachers are integrating discovery skill teaching strategies in the classroom?
4. Do differences exist between Business/Marketing teachers' perceived discovery skills based on the following demographics: (a) highest degree, (b) teacher certification, (c)

race/ethnicity, (d) number of years teaching, (e) type of school, (f) state of employment, and (g) gender?

Summary of Findings

The highest number of participants held a master's degree (52%) and (46%) of participants indicated having a class A certification. The largest percentage of participants by race/ethnicity were identified as White or Caucasian (67%). Of the total number of participants, (35%) percent of the participants indicated having 11-15 years of teaching experience, and (60%) indicated having teaching experience or having experienced teaching on in a secondary school setting. The majority of participants who completed the survey reported Alabama as their state of employment (31%). Most of the participants were female (64%).

To assess participants' overall level of discovery skills, a composite score was calculated using the odd-numbered items responses. Each item was rated on a 5-point Likert scale ranging from 5-Strongly agree, 4-Somewhat agree, 3-Neither agree nor disagree, 2-Somewhat disagree, and 1-Strongly disagree. The responses to the five items were averaged to create a single composite score for each participant. The mean score was selected to ensure that the overall composite score for each construct maintained its internal consistency. The average mean score for discovery skills was ($M = 2.66$, $SD = .87$) suggesting that, on average, participants viewed themselves as rarely engaging in innovative thinking. This finding reflects a moderate to low and moderate to high self-perception of innovative thinking. If teachers do not believe in themselves to teach the students discovery skills, the preparation for middle/junior high, secondary, and postsecondary students to become disruptive innovators will be delayed.

To analyze the perceived level of discovery skills of the participants, frequencies were conducted. The independent variables for this research question were discovery skills, and the dependent variables were the level of agreements. A five-point Likert-type scale included statements indicating the level of agreement regarding the participants' perception based on their discovery skills 5-Strongly agree, 4-Somewhat agree, 3-Neither agree disagree, 2-Somewhat disagree, and 1-Strongly disagree. The top discovery skills indicated by participants were networking with the highest percentage (55%) of "Strongly agree" 'I attend conferences (on my areas of expertise as well as unrelated areas) to network and understand what issues they are facing' followed by observing at (56%) of "Somewhat agree" where participants reported 'I often find solutions to problems by drawing on solutions or ideas developed in other classrooms or other disciplines. Participants self-reported feeling confident in their ability to leverage their discovery skills surrounding networking and observing as they reported actively participating in conferences and finding solutions or ideas developed to stay up to date in their field. This demonstrates that teachers self-reported high levels of competence in networking and observing indicated broad overall confidence. This demonstrates that teachers self-reported higher levels of competence in networking and observing. Thompson et al., (2004) agreed that members of a team learn together as a component of growing and contributing to improving the organization.

Furthermore, the least agreed with statement was "Frequently, my ideas or perspectives diverge radically from other's perspectives" at (8%). This indicates participants lack confidence to leverage their discovery skills surrounding associating to think individually from other's perspectives with connecting unrelated ideas while traditional practices are not inclusive.

Business/Marketing teachers were also asked to rate the extent of integrating discovery skill teaching strategies in the classroom on a five-point Likert-type scale. The options were 5-

Always, 4-Very often, 3- Sometimes, 2-Rarely, and 1-Never. Results indicated that overall, Business/Marketing teachers integrated the discovery skill teaching strategies sometimes on average ($M = 3.72$, $SD = .54$).

A further look into the top teaching strategy for associating indicated by participants at (36%) was “Students have open class discussions about a particular topic or subject”. Teachers self-reported feeling comfortable allowing students to have open discussions and address issues that produce an outcome to ensure students have an understanding that it is acceptable to have a difference of opinion. The bottom teaching strategy indicated by participants at (13%) was ‘Students explore topics not directly related to the subject I teach’ which was ‘rarely’ integrated. Participants self-reported feeling less confident allowing students to explore topics they themselves do not teach. Participants understanding the importance of exploration helps students look at things differently and beyond what they already know.

Next, the top teaching strategies for questioning indicated by participants at (54%) was ‘Students ask questions in my classroom on a regular basis which was ‘always’ integrated followed by (61%) reported ‘very often’ for ‘Students synthesize information to make decisions’. Teachers self-reported feeling confident in creating teaching strategies that allow students to engage in the lessons and synthesize information to make informed decisions. Creative thinking incorporated in classroom instruction such as open-ended questions, real-life problem solving, and analogies may help with student engagement that improves achievement (Schacter et al., 2006).

Next, the top teaching strategies for observing indicated by participants at (29%) was ‘Students use real-world situations that are significant to generate a new idea’ followed by (52%) reported ‘very often’ for ‘Students observe before making a decision’. Participants reported

feeling capable in allowing students to use real-world situations and observation before making decisions. This indicated that teachers understand the importance of students reflecting on current issues in the world today. The reality is that some situations portray a false narrative which then allows students to observe and make decisions on what they observe.

Furthermore, the top teaching strategies for networking indicated by participants at (15%) was ‘Students network with students from other disciplines’ followed by (52%) reported ‘very often’ for ‘Students increase their collaborative efforts to learn new things’. Participants reported feeling competent in their ability to network with students from other disciplines and collaborating to learn new things. This demonstrates teachers understand the power of connection. Additionally, teachers understand that in order to diversify learning, students need the opportunity to share their thoughts and input which gives them a sense of belonging with an engaged mindset.

Lastly, the top teaching strategies for experimenting indicated by participants at (39%) was ‘Students have a safe place to take risk’ followed by (66%) ‘very often’ for ‘Students demonstrate understanding of a concept utilizing scenarios’. Participants reported feeling proficient with providing students a safe place to take risks and facilitating opportunities for students to demonstrate understanding of concepts by using scenarios. This demonstrates that teachers can create an environment where students feel comfortable. Teachers can welcome discussions and mistakes/retakes of what students are being taught. Teachers can allow students to demonstrate their ability to make good decisions.

The discovery skill teaching strategies mean scores indicated “sometimes” on average ($M = 3.72$, $SD = .54$). The results reveal that participants’ knowledge base plays a vital role in preparing students to be disruptors. Presenting opportunities that are practical with applied

learning can help students gain the innovative trajectory. Occasional integration of discovery skill teaching strategies may delay the effectiveness of understanding the dynamics of being a disruptor.

A Pearson correlation analysis was conducted to examine between Business/Marketing teachers' perceived discovery skills and their integration of teaching strategies in the classroom. The results indicated that there were two statistically significant correlations identified. The first being associating strategies were positively correlated with discovery skill observing ($r = .245, p = .014$). This demonstrates that teachers who frequently integrate strategies related to associating tend to have higher observing skills. Second, questioning strategies were positively correlated with discovery skill observing ($r = .249, p = .013$). The other correlations were not significant indicating that discovery skill strategies were not significant to their own corresponding discovery skill.

A one-way ANOVA was conducted to examine group differences in the perception of Business/Marketing teachers' discovery skills and their demographics, represents the independent variables analyzed. The results were not statistically significant among group differences in perceived discovery skills based on highest degree $F(3,93) = .33, p = .81$, type of certification $F(5,90) = .36, p = .88$, race/ethnicity $F(4,95) = 2.04, p = .09$, years teaching $F(3,96) = 1.09, p = .36$, school type $F(2,88) = 1.53, p = .22$, state of employment $F(10,89) = 1.13, p = .35$, or gender $F(1,97) = 1.18, p = .28$. This indicated that regardless of their demographic background, the participants' perception of discovery skills was consistent across groups with similar viewpoints.

Examining the mean scores for each category for the highest level of degree, participants who reported having a doctorate reported a higher level of confidence in discovery skills.

However, when looking at certification as a category, more teachers had a higher perception of discovery skills when they had a class B certification. Having a bachelor's degree denotes a difference as compared to having a certificate. Participants selected either the doctoral survey option or the class B certification survey option. Perhaps this was due to their not being a survey option to report having both the doctorate and class B certification. It also demonstrates that different participants selected the doctoral survey option and different participants selected the class B certification survey option; perhaps due to no certification for the doctorate, the participants answered the questions presented.

Next, examining the mean scores for race/ethnicity, this indicated that Black or African American participants reported having higher confidence in discovery skills compared to Whites or Caucasian participants. This may be due to the sample size and the number of participants who identified as Black who are also SBEA members. The majority of the SBEA participants identified as White or Caucasian. Furthermore, examining the mean scores for years of experience, participants with 0-5 years reported having higher confidence in discovery skills. However, when looking at type of school as a category, more teachers indicated they work at the postsecondary level. This demonstrates that perhaps teachers with less experience and teachers who teach on the postsecondary level have resources that provide opportunities that increase their awareness of discovery skills.

Continuing to examine the mean scores for state of employment indicate that participants from Florida had higher confidence in discovery skills. However, participants who reported employment in Alabama were a close second, indicating these teachers had higher confidence in teaching discovery skills. Demonstrating that perhaps teachers in Florida and Alabama have more opportunities to increase their teaching discovery skill perception. Finally, examining the

mean scores for gender, male teachers reported having higher confidence in teaching discovery skills as compared to female participants. This may be due to sample size and the number of male teachers who are SBEA members and who completed the survey. It is important to note though however, more female teachers are SBEA members.

Conclusions

Data was collected from SBEA members concerning their self-perceived level of Business/Marketing teachers discovery skills; the extent of Business/Marketing teachers' integrating discovery skill teaching strategies in the classroom; the correlation between the level of a Business/Marketing teachers' perceived discovery skills and the extent to which the Business/Marketing teachers' integrate discovery skill teaching strategies in the classroom; and the differences among Business/Marketing teachers' perceived discovery skills based on their demographics. The following conclusions were derived based on the findings of this study.

1. The majority of the Business/Marketing teachers who completed the survey were female, most held a master's degree, with the highest certification category being class A. The majority who completed the survey were White or Caucasian, with the highest number having taught 11-15 years and teach or have taught in a secondary school setting. Additionally, a significant number of Business/Marketing teachers in the study reported employment in the state of Alabama.
2. Business/Marketing teachers self-reported feeling confident in their ability to leverage their discovery skills surrounding networking and observing as they reported actively participating in conferences and find solutions or ideas developed to stay up-to-date in their field. However, Business/Marketing teachers self-reported lack of confidence to leverage their discovery skills surrounding associating to think

individually from other's perspectives with connecting unrelated ideas. While traditional teaching practices are not inclusive of these perspectives, perhaps teaching disruptive innovation skills, these perspectives should be included in contemporary practices,

3. Overall, Business/Marketing teachers reported sometimes integrating the discovery skill teaching strategies into the classroom. A further look into the associating discovery skill results indicated teachers self-reported feeling comfortable, allowing students to have open discussions and address issues that produce an outcome, thus ensuring students have an understanding that it is ok to have a difference of opinion. Whereas Business/Marketing teachers self-reported feeling less confident allowing students to explore topics they themselves do not teach. For teachers to prepare students to become disruptive innovators, they themselves must explore what is unfamiliar to them to gain understanding to better assist students.

Next, the discovery skill questioning result indicated Business/Marketing teachers self-reported confidence in creating teaching strategies that allow students to engage in the lessons and synthesize information to make informed decisions. Whereas Business/Marketing teachers self-reported being unsure when integrating activities that allow students to take ownership of topics they are interested in. Teachers must find opportunities to allow students to choose what they are interested in and apply their own learning interpretation.

Next, the discovery skill observing result indicated Business/Marketing teachers self-reported feeling capable in allowing students to use real-world situations and observation before making a decision. Whereas Business/Marketing teachers self-

reported being less capable in allowing students to shadow and role play in environments not familiar to them. This indicates that teachers have to foster a culture of exploration in the classroom and outside of the classroom.

Furthermore, the discovery skill networking indicated Business/Marketing teachers self-reported feeling competent in their ability to network with students from other disciplines and collaborating to learn new things. Whereas Business/Marketing teachers self-reported feeling inadequate facilitating students networking with students from other countries. How can teachers themselves prepare students for a global workforce if they are inadequately prepared to facilitate networking opportunities with those from other countries?

Lastly, the discovery skill result experimenting indicated Business/Marketing teachers self-reported feeling proficient with providing students a safe place to take risks and facilitating opportunities for students to demonstrate understanding of concepts by using scenarios. Whereas Business/Marketing teachers self-reported feeling indifferent in allowing students to participate in student -led organizations. Teachers must find ways to incorporate time during the day to discuss student led organizations. This is helpful for students who do not have the resources to stay past the regular school day hours.

4. The results indicated that there were two statistically significant correlations identified. The first being associating strategies were positively correlated with discovery skill observing ($r = .245$, $p = .014$). This demonstrates that teachers who frequently integrate strategies related to associating tend to have higher observing skills. Second, questioning strategies were positively correlated with discovery skill

observing ($r = 249, p = .013$). This demonstrates that teachers who frequently integrate strategies related to questioning tend to have higher observing skills and challenge the status quo. The other correlations were not significant indicating that discovery skill strategies were not significant to their own corresponding discovery skill.

5. There were no statistically significant group differences in the perception of discovery skills and demographics (a) highest degree, (b) teacher certification, (c) race/ethnicity, (d) number of years teaching, (e) type of school, (f) state of employment, and (g) gender. The study results indicate teachers who reported having a doctorate reported having a higher level of confidence in discovery skills. However, more teachers reported a higher perception of discovery skills that also reported having the ass B certification. Having a bachelor's degree indicated a difference in perception of discovery skills as compared to those who only had a class B certification. Various teachers selected the doctoral survey option and various teachers selected the Class B certification survey option. Next, race/ethnicity indicated that Black or African American participants reported having higher confidence in discovery skills compared to Whites or Caucasian participants. The majority of the SBEA participants identified as White or Caucasian.. Furthermore, years of experience indicated that participants with 0-5 years reported have higher confidence in discovery skills. However, when looking at the type of school, more teachers indicated they work at the postsecondary level. Continuing to examine the state of employment, Business/Marketing teachers employed in Florida reported higher confidence in teaching discovery skills.

However, teachers reporting Alabama as their state of employment was a close second, also indicating higher confidence in teaching discovery skills. This indicates that perhaps teachers who work in Florida and Alabama have more professional and peer development opportunities, at a greater frequency to increase their discovery skills perception. Finally, results related to gender indicated that male teachers reported having higher confidence in teaching discovery skills as compared to female teachers. This may be due to the sample size and the number of participants who identified as male teachers who are also SBEA members. Although more female teachers are members of SBEA, their representation did not proportionally indicate the large female membership of SBEA.

Recommendations

Based on the present research study conclusions, the following recommendations are made:

1. The majority of the Business/Marketing teachers were female, held a master's degree, and were White or Caucasian. It is recommended if this study is replicated that various gender affiliations and ethnicities are recruited for greater representation among future study results. The more diverse the sample size, the greater likelihood diverse perspectives will emerge. A recommendation is to survey all Business/Marketing teachers to assess member engagement and perspectives of SBEA.
2. Business/Marketing teachers lack confidence to leverage their discovery skills surrounding associating to think individually from other's perspectives with connecting unrelated ideas. While traditional teaching practices are not inclusive

of connecting unrelated ideas, it is recommended they should be included in contemporary practices for fostering disruptive innovation skills. A recommendation is to allow Business/Marketing teachers the opportunity to think independently in creating lesson plans that display their creativity beyond the standard curriculum for business education. Also, attend conferences that are designed to develop the innovative mindset of teachers so they can teach students how to be disruptors. If teachers do not believe in themselves to teach the students discovery skills, the preparation for middle/junior high, secondary, and postsecondary students to become disruptive innovators will be delayed.

3. To mitigate Business/Marketing teachers that may feel unsure when integrating discovery skill teaching strategies in the classroom that allow students to take ownership of topics they are interested in; it is important that teachers foster student's risks taking. A recommendation is for teachers to create spaces in the classroom for students to take ownership of their own learning. Spaces that provide inquiry-based learning that enables deeper understanding of a particular topic.
4. The daily responsibilities of Business/Marketing teachers can be overwhelming, and they can feel inadequate facilitating students networking with students from other countries. A recommendation is to partner with colleges, universities, and organizations who offer global exposure, international emersion and study aboard programs with existing partnerships in other countries. Globalization cannot be taught on the local educational level if teachers are inadequately exposed to prepare students for the global workforce and for competing globally. As evident

in the literature, employers are looking for employees with higher-order critical thinking and future innovative building skills to remain globally competitive (Scott, 2020).

5. It is recommended that Business/Marketing teachers work closely with the State Department of Education business standards and align the discovery skill teaching strategies with the subjects taught by Business/Marketing teachers. Teachers can focus on identifying if certain discovery skill teaching strategies have a different impact on males and females and Black or African Americans. This can help improve student confidence and student ability in both traditional and non-traditional gendered careers and assist minority ethnic groups with discovery skill development.
6. It is recommended that all certified business education teachers, no matter the subject area expertise, be invited to participate in this type of research study. This professional engagement activity will help teachers reflect and identify what subject areas they are well integrating discovery skills and where they can start integrating discovery skills.
7. Using a qualitative type of research study, with open-ended questions and/or a semi-structured interview could richly capture teachers' self-perception of teaching discovery skills and the extent of integrating discovery skill teaching strategies in the classroom. This may further aid in the discovery of teachers lived experiences and understanding teacher's educational journey to develop a competence of teaching style. A future study of this type may help lay the groundwork for the development of a theory for the preparation of students who

have graduated from business education programs and assessing their knowledge of discovery skills for fitness to enter the workforce as a disruptive innovator.

8. It is recommended that ongoing research be conducted during local, state, and regional convenings on an annual basis to foster continuous engagement.

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APPENDIX A

Participation Survey Email

From: Member Service <memberservice@nbea.org>
To: "alesia.ruffin@yahoo.com" <alesia.ruffin@yahoo.com>
Sent: Wednesday, June 23, 2021 at 04:06:08 PM CDT
Subject: Please help a fellow business educator!

This email is being sent by National Business Education Association on behalf of Margaret M. Coleman / MARIE.COLEMAN@SOWELA.EDU

Good afternoon all!

I hope you all are staying cool in this heat!

I am writing to you to request that you please help out one of our fellow business educators with her collection of data for her Ph.D. program at Auburn University. She needs more [data](#) and you are the one to provide it! :)

Please take a few minutes and complete the following survey for Alesia Ruffin. I know she will greatly appreciate your assistance.

Take care!

Marie Coleman
SBEA President

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS IRB APPROVAL INFORMATION WITH CURRENT DATES HAS BEEN ADDED TO THIS DOCUMENT.)

INFORMATION LETTER

for a Research Study entitled

"The Development of Disruptive Innovators in Business/Marketing Education"

You are invited to participate in a research study to determine the extent to which innovation discovery skills are implemented in business/marketing education curriculum. This study is being conducted by Alesia C. Ruffin, a graduate student, under the direction of Dr. Leane B. Skinner, Professor at Auburn University in the Department of Curriculum and Teaching in the College of Education. You are invited to participate because you are a member of the Southern Business Education Association.

What will be involved if you participate? Your participation is completely voluntary. If you decide to participate in this research study, you will be asked to complete this online survey. Your total time commitment will be approximately 10 minutes.

Are there any risks or discomforts? There are not any known risks or discomforts associated with this study.

Are there any benefits to yourself or others? There are not any benefits to you or to others.

Will you receive compensation for participating? There will not be any compensation for participating.

Are there any costs? If you decide to participate, you will not incur any costs.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Once you've submitted anonymous data, it cannot be withdrawn since it will be unidentifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University, the Department of Curriculum and Teaching or Business/Marketing Education program.

Any data obtained in connection with this study will remain anonymous. We will protect your privacy and the data you provide by not having any identifiable information on the survey itself. Information collected through your participation may be published as part of a dissertation to fulfill an education requirement, published in a professional journal or magazine, and/or presented at a professional meeting.

If you have questions about this study, please contact me, Alesia Ruffin at azr0050@auburn.edu or my advisor, Dr. Leane Skinner at skinnal@auburn.edu.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Research Compliance or the Institutional Review Board by phone (334) 844-5966 or e-mail at IRBadmin@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH STUDY. BY CLICKING THE LINK TO CONTINUE TO THE SURVEY INDICATES YOUR WILLINGNESS TO PARTICIPATE IN THIS STUDY. IF YOU WOULD LIKE A COPY OF THIS INFORMATION LETTER FOR YOUR RECORDS, PLEASE PRINT IT NOW.

The Auburn University Institutional Review Board has approved this document for use from 05/28/2021 to ----- Protocol # 21-240 EX 2105

Link to survey: https://auburn.qualtrics.com/jfe/form/SV_e4jEVspQCpE9P1P

APPENDIX B

IRB Application Approval

From: IRB Administration <irbadmin@auburn.edu>

Subject: Ruffin Approval Exempt Protocol # 21-240 EX 2105 "The Development of Disruptive Innovators in Business/Marketing Education"

Date: June 1, 2021 at 10:25:34 AM CDT

To: Alesia Ruffin <azr0050@auburn.edu>

Cc: Leane Skinner <skinnal@auburn.edu>, Marilyn Strutchen <strutme@auburn.edu>

Use IRBsubmit@auburn.edu for protocol-related submissions and IRBadmin@auburn.edu for questions and information.

The IRB only accepts forms posted at <https://cws.auburn.edu/vpr/compliance/humansubjects/?Forms> and submitted electronically.

Dear Ms. Ruffin,

Your protocol titled "The Development of Disruptive Innovators in Business/Marketing Education" has been approved by the IRB as "Exempt" under federal regulation 45 CFR 46.101(b)(2(i)). Attached is a copy of your approved request.

Official notice:

This e-mail serves as official notice that your protocol has been approved. By accepting this approval, you also accept your responsibilities associated with this approval. Details of your responsibilities are attached. Please print and retain.

Expiration:

Continuing review of this Exempt protocol is not required; however, all modification/revisions to the approved protocol must be reviewed and approved by the IRB.

-
When you have completed all research activities, have no plans to collect additional data and have destroyed all identifiable information as approved by the IRB, please notify this office via e-mail. A final report is no longer required for Exempt protocols.

Best wishes for success with your research!

IRB Admin
Office of Research Compliance
Auburn University
540 Devall Drive
Auburn, AL 36832

APPENDIX C



5040 HALEY CENTER
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Information Letter

COLLEGE OF EDUCATION CURRICULUM & TEACHING

NOTE: DO NOT AGREE TO PARTICIPATE UNLESS IRB APPROVAL INFORMATION WITH CURRENT DATES HAS BEEN ADDED TO THIS DOCUMENT.

INFORMATION LETTER for a Research Study entitled "The Development of Disruptive Innovators in Business/Marketing Education"

You are invited to participate in a research study to determine the extent to which innovation discovery skills are implemented in business/marketing education curriculum. This study is being conducted by Alesia C. Ruffin, graduate student, under the direction of Dr. Leane B. Skinner, Professor at Auburn University in the Department of Curriculum and Teaching in the College of Education. You are invited to participate because you are a member of the Southern Business Education Association.

What will be involved if you participate? Your participation is completely voluntary. If you decide to participate in this research study, you will be asked to complete this online survey. Your total time commitment will be approximately 10 minutes.

Are there any risks or discomforts? There are not any known risks or discomforts associated with this study.

Are there any benefits to yourself or others? There are not any benefits to you or to others.

Will you receive compensation for participating? There will not be any compensation for participating.

Are there any costs? If you decide to participate, you will not incur any costs.

If you change our mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Once you've submitted anonymous data, it cannot be withdrawn since it will be unidentifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University, the Department of Curriculum and Teaching or Business/Marketing Education program.

Any data obtained in connection with this study will remain anonymous. We will protect your privacy and the data you provide by not having any identifiable information on the survey itself. Information collected through your participation may be published as part of a dissertation to fulfill an education requirement, published in a professional journal or magazine, and/or presented at a professional meeting.

If you have questions about this study, please contact me, Alesia Ruffin at azr0050@auburn.edu or my advisor, Dr. Leane Skinner at skinnal@auburn.edu.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Research Compliance or the Institutional Review Board by phone (334) 844-5966 or e-mail at IRBadmin@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH STUDY. BY CLICKING THE LINK TO CONTINUE TO THE SURVEY INDICATES YOUR WILLINGNESS TO PARTICIPATE IN THIS STUDY. IF YOU WOULD LIKE A COPY OF THIS INFORMATION LETTER FOR YOUR RECORDS, PLEASE PRINT IT NOW.

The Auburn University Institutional
Review Board has approved this
Document for use from
05/28/2021 to _____
Protocol # 21-240 EX 2105



COLLEGE OF EDUCATION
CURRICULUM & TEACHING

Alia R. P. of 05/18/2021
Investigator Date

Co-Investigator Date

The Auburn University Institutional Review Board has approved this document for use from _____ to _____, Protocol # _____

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APPENDIX D

Survey Instrumentation: Innovation Skills Survey

Section 1: Disruptive Innovators

Please indicate your level of agreement with the following. Be sure to answer based on your actual behaviors, and not what you would like to do.

Discovery Skills	5 - Strongly Agree	4 - Somewhat Agree	3 - Neither Agree or Disagree	2 - Somewhat Disagree	1 - Strongly Disagree
1. Frequently, my ideas or perspectives diverge radically from other's perspectives.					
2. I am very careful to avoid making any mistakes at school.					
3. I regularly ask questions that challenge the status quo.					
4. I am extremely well organized at school.					
5. New ideas often come to me when I am directly observing how teachers interact with students.					
6. I must have everything finished "just right" when completing my lesson plans.					
7. I often find solutions to problems by drawing on solutions or ideas developed in other classrooms or other disciplines.					
8. I never jump into new projects and act quickly without carefully thinking through all of the issues.					
9. I frequently experiment to create new ways of doing things in the classroom.					
10. I always follow through to complete a task, no matter what the obstacles.					

Section 1: Disruptive Innovators

Please indicate your level of agreement with the following. Be sure to answer based on your actual behaviors, and not what you would like to do.

Discovery Skills	5 - Strongly Agree	4 - Somewhat Agree	3 - Neither Agree or Disagree	2 - Somewhat Disagree	1 - Strongly Disagree
11. I regularly talk with a diverse set of people (e.g., community stakeholders, parents) to find and refine new ideas.					
12. I excel at breaking down a goal or plan into the micro tasks required to achieve it.					
13. I attend conferences (on my areas of expertise as well as unrelated areas) to network and understand what issues they are facing.					
14. I pay careful attention to details at school to ensure that nothing is over-looked.					
15. I actively seek to identify emerging trends by reading books, articles, magazines, blogs, and so on.					
16. I hold myself and others strictly accountable for getting results.					
17. I frequently ask "what if" questions that provoke exploration of new possibilities.					
18. I consistently follow through on all commitments and finish what I've started.					
19. I regularly observe the activities of fellow teachers to get new ideas.					
20. I consistently create detailed lesson plans.					

Section 2:

Teaching Activities

The following questions are designed to see how often you implement these activities in your classroom.
How often do you implement the following in your classroom?

Discovery Skills

5 - Always 4 – Very Often 3 - Sometimes 2 - Rarely 1 - Never

- 21. Students explore topics not directly related to the subject area I teach.
 - 22. Students take ownership of their own learning.
 - 23. Students collaborate with each other on projects.
 - 24. Students have open class discussions about a particular topic or subject.
 - 25. Students understand the scope of an idea to produce an end result.
 - 26. Students address issues that will generate a good outcome.
 - 27. Students have the opportunity to express one's feelings in a productive way.
-

Section 2: Teaching Activities

The following questions are designed to see how often you implement these activities in your classroom.
How often do you implement the following in your classroom?

Discovery Skills	5 - Always	4 - Very Often	3 - Sometimes	2 - Rarely	1 - Never
28. Students ask questions in my classroom on a regular basis.					
29. Students select topics on their own to learn about.					
30. Students research new ideas and present their findings to their peers.					
31. Students seek ways to gain an understanding about a new idea.					
32. Students synthesize information to make decisions.					
33. Students use reflective thinking to solve problems.					

Section 2: Teaching Activities

The following questions are designed to see how often you implement these activities in your classroom.
How often do you implement the following in your classroom?

Discovery Skills	5 - Always	4 - Very Often	3 - Sometimes	2 - Rarely	1 - Never
34. Students observe before making a decision.					
35. Students explore in my classroom to improve a common process.					
36. Students create their own space for learning.					
37. Students reflect after daily activities.					
38. Students shadow others in environments not familiar to them.					
39. Students role play environments they observe.					
40. Students use real-world situations that are significant to generate a new ideas.					

Section 2: Teaching Activities

The following questions are designed to see how often you implement these activities in your classroom.
How often do you implement the following in your classroom?

Discovery Skills	5 - Always	4 - Very Often	3 - Sometimes	2 - Rarely	1 - Never
41. Students network with students from other disciplines.					
42. Students network with students from other countries.					
43. Students engage with outside speakers.					
44. Students visit businesses/industries for career exploration.					
45. Students apply their skills and knowledge in external settings.					
46. Students increase their collaborative efforts to learn new things.					

Section 2: Teaching Activities

The following questions are designed to see how often you implement these activities in your classroom.
How often do you implement the following in your classroom?

Discovery Skills

5 - Always 4 - Very Often 3 - Sometimes 2 - Rarely 1 - Never

47. Students have the flexibility to explore new ideas.

48. Students participate in workforce readiness activities.

49. Students participate in student lead organizations.

50. Students have a safe place to take risk.

51. Students demonstrate understanding of a concept utilizing scenarios.

52. Students have a space to revise their way of thinking.

53. Students are given tasks that create innovativeness.

54. Students select less restrictive spaces that do not threaten their freedom of design.

55. Students are driven by the ability to openly explore opportunities for growth.

Section 3: Teacher Background/Demographics

The following questions are designed to collect demographics about Business/Marketing teachers participating in this research project. Please tell us about yourself, indicate the best answers for the following:

56. What is your highest degree?

- Bachelor's Degree
- Master's Degree
- Education Specialist Degree
- Doctorate

57. What is the highest certification you have or are completing? Choose one:

- Class B (Bachelor's Degree)
 - Class A (Master's Degree)
 - Class AA (Ed.Specialist or Sixth-year Equivalent Technical Education Certificate)
 - CTE Temporary Certification
 - Bachelor/Master's Degree Equivalent Technical Education Certificate
 - Provisional Certificate in a CTE Teaching Field
 - Emergency Certification
 - Substitute Teacher License
 - Certification not required
-

58. What is your race / ethnicity?

- Black or African American
- White or Caucasian
- Hispanic or Latino
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Other

59. How many years have you been a Business/Marketing teacher?

- 0-5
- 6-10
- 11-15
- 20+

60. What type of school?

- Middle/Junior 6-8
 - High School 9-12
 - PostSecondary
-

61. In which state are you employed?

- Alabama
- Arkansas
- Florida
- Georgia
- Kentucky
- Louisiana
- Mississippi
- North Carolina
- South Carolina
- Tennessee
- Virginia
- West Virginia

62. What is your gender?

- Male
- Female