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**Demographic data of business education licensure completers over a thirteen-year period:
A longitudinal study**

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Abstract:

The purpose of this descriptive research study was to describe the demographic data of undergraduate and graduate Business Education licensure completers over a thirteen-year period, starting with the school years of 2008/2009 through the school year of 2020/2021. A further purpose of the study was to describe trends found in the demographic data and to describe how the trends impact Business Education licensure completers within the timeframe. The researchers used a non-experimental, descriptive, research design to address the research objectives (Creswell, 2012). This study was significant in that much of the data related to teaching is generalized and not specific to specialties. This research aims to provide those involved in preparing business education preservice teachers with some possible expectations as to demographics, GPA, credits, gender, and age. This information can be used to improve recruitment and program design for business education teachers

Introduction

Post-secondary programs that offer licensure in PK-12th grade Business Education produce a diverse array of future teachers across the United States. These future teachers vary among different demographic variables such as gender, age at the time of completing the licensure program, cumulative undergraduate GPA, cumulative credit hours earned, and others that are a part of a teacher's demographic background (Force & Jeffery, 2019). With an expected job outlook increase of seven percent for kindergarten and elementary school teachers (Bureau of Labor Statistics, 2021a), seven percent for middle school teachers (Bureau of Labor Statistics, 2021b), and eight percent for high school teachers from 2020–2030 (Bureau of Labor Statistics, 2021c), there will be a continued need for Business Education teachers from all grade levels to teach a variety of business and technology courses and concepts. However, an overarching question remains: *Just what are the backgrounds of those entering the teaching profession to teach Business Education courses?*

For those who do choose the teaching profession, there are two distinctive ways in which a person can obtain the needed licensure to teach Business Education at the PK–12th grade levels, including a traditional pathway and alternative pathway. There are certain requirements put in place by each state, and these requirements can vary by state (Teacher Certification Degrees, 2022b). For the traditional pathway, undergraduate and graduate students typically complete licensure requirements which include content and pedagogical courses, field experiences, licensure assessments, and a culminating student teaching experience. For the alternative

pathway, these teachers may complete similar requirements for those who enter via the traditional pathway, or there may be certain requirements that are only in-place for alternative licensure students (Teacher Certification Degrees, 2022c).

In the state of Pennsylvania, undergraduate licensure completers in Business Education must complete a traditional pathway, while graduate licensure completers can choose from either the traditional or alternative pathway. Each pathway in Pennsylvania has certain requirements that are germane to either pathway, and similarities that overlap for both pathways such as licensure assessments and field-based observations (Pennsylvania Department of Education, 2021). Business education teachers, whether they complete an undergraduate or graduate program, must be prepared to teach a wide array of courses (Jeffery, 2020), and they have a variety of backgrounds and experiences that they bring to the teaching profession. The aim of the study, as noted in the next section, is to describe the demographic backgrounds of business education students who complete all licensure requirements (and referred to as “completers”) among certain available demographic characteristics.

Purpose of the Study

The purpose of this descriptive research study was to describe the demographic data of undergraduate and graduate Business Education licensure completers over a thirteen-year period, starting with the school years of 2008/2009 through the school year of 2020/2021. A further purpose of the study was to describe trends found in the demographic data and to describe how the trends impact Business Education licensure completers within the timeframe. The study was significant in providing baseline demographic data of those who choose to complete Business Education licensure requirements at a mid-Atlantic university as an undergraduate or graduate student. An objective of the study was to describe the demographic backgrounds of licensure completers (those who complete either a traditional or alternative pathway/route) to become P/K-12th grade Business Education certified to then uncover trends among those data about the completers’ backgrounds.

Conceptual Framework

The conceptual framework for the study was based on the existing framework from a study by Zirkle et al. (2019), in which the researchers examined the demographic data of career and technical education teachers during a longitudinal period. Additionally, the researchers examined a set of longitudinal data to describe and explore teacher demographic data to address the research objectives of the study which also included teacher retention. Using the existing framework from the Zirkle et al. (2019) study, the researchers examined certain demographic variables to describe the demographic backgrounds of licensure completers specific to the field of business education during a longitudinal period, and with existing data. It should be noted that describing and exploring teacher retention was outside the scope of this study.

Review of the Literature

There are a variety of reasons why people choose to enter the teaching profession and surprisingly the time off is not one of the main motivators. Many teachers cite the desire to work with young people and make a difference as to why they chose the profession. Many teachers were positively impacted by a teacher, and this inspired them to want to do the same for others. Another reason cited as to what leads to teaching is the variety the job brings. A day in the life

of a teacher presents a variety of daily tasks, lessons and challenges. Despite the challenges faced in teaching, many who enter the profession teach because they find it fun, and it allows them to use their creativity. In addition, many who teach are passionate about the subject they teach and want to share this with their students (Marsh, 2015).

Teaching has typically been a profession that is composed primarily of females. That trend continues today, but that does not mean that males are not entering the profession. There has been a 31 percent increase of males entering the teaching profession in the public-school system. However, the considerable number of females entering the profession compared to males still makes teaching a female dominated occupation (Ingersoll et al., 2018). In addition, teaching has been labeled as attracting students that are less academically inclined. SAT and ACT scores for those graduating with a degree in education are well below those of those undergraduates in other majors (Ingersoll et al., 2018).

Teacher shortage was a problem before the COVID19 pandemic, but with additional stress faced by teachers, many are leaving the profession. The supply of qualified teachers does not meet the demand and the shortage continues to grow (Pandey, 2021). Unfortunately, the supply of new teachers is atypically low and has been declining. Teacher education enrollments dropped 35% between 2009 and 2014. In addition, student enrollment is increasing; thus, magnifying the need for even more teachers (Sutcher et al., 2016). This shortage and lack of qualified teachers had led districts to seek creative ways to find qualified teachers other than the traditional methods.

The traditional pathway to teaching usually includes obtaining an undergraduate degree in education which culminates with student teaching. Many times, it is thought that the typical education graduate can be teaching by the age of 22 or 23. However, this is only the case for about 55% of the teachers entering the profession in the United States. Nine percent of those entering the teaching profession are 40 years of age or older and 16% in their thirties with 20% in their late 20s (Aldeman, 2019). Alternative licensure pathways allow the more experienced and mature individual the opportunity to enter the teaching profession with less restrictions.

The teacher shortage coupled with an individual's desire to enter teaching later in life has led to the prevalence of alternative licensure pathways. This pathway, also known as non-traditional teacher certification, allows individuals with the desire to teach but lacking the educational background the opportunity to become certified teachers. The programs vary state by state, but most require a bachelor's degree in the area in which you are interested in teaching. There are programs that allow teachers to teach while working on coursework that can lead to a master's degree or post-graduate certificate and this can be achieved in one to two years (Teacher Certification Degrees, 2022a).

Overview of the teaching program

The mid-Atlantic university addressed in this study offers both an undergraduate and graduate degree in Business Education that provides a state teaching certificate. The undergraduate program includes classes in both business and education. The Master of Education (M.Ed.)-Business Education has three different tracks—master's degree only, master's degree with student teaching and master's degree with internship. The student teaching track is for those who want the experience of collaborating with a mentor teacher during a 16-week student teaching

placement. The Intern track is for students who are enrolled in the master's program, successfully passed the appropriate Praxis tests and have been hired as a full-time Business Education teacher.

Research Design and Methodology

The researchers used a non-experimental, descriptive, research design to help to address the objectives of the study (Creswell, 2012). To gather data for the study, several internal data sources, such as a database, were provided to the researchers with selected variables included in the data source, including gender, age at the time of graduation, GPA, and other pertinent data related to the study. The researchers then aggregated all the sources to review which variables could describe both undergraduate and graduate licensure completers, and which graduation years were included within the data sources. It was concluded that the oldest graduation year was for the 2008/2009 school year and went through the 2020/2021 school year. The researchers were able to include longitudinal data over a twelve-year period.

The variables that were included in the study were also determined to be of interest after an exhaustive literature review, and by examining a similar study that had been conducted on career and technical education completers (Zirkle et al., 2019), and using some of the same variables from a study conducted by Force & Jeffery (2019). However, this study focused only on describing the demographic data of completers who sought K-12 licensure as part of either an undergraduate or graduate Business Education program. Those completers who graduated with either an undergraduate degree in Business Education but no K-12 licensure or graduate completers who only completed an M.Ed.-only: no licensure, were excluded from the dataset and study. A delimitation of the study was only undergraduate or graduate completers who sought K-12 licensure.

Since was a descriptive research study, analysis was conducted using a quantitative analysis. Quantitative analysis included measures of central tendency and average condition functions using Microsoft Excel to describe the data and interpret it for trends, and qualitatively on certain variables, such as gender, to describe differences between undergraduate and graduate completers. A major goal of the study was to determine trends among the different types of variables in addition to describing those students who complete a Business Education program for licensure. It was fully IRB- approved (IRB# 2021-5-COB).

Results

What are the demographic data of undergraduate and graduate program completers of an approved post-secondary institution for licensure of Business Education during the school years of 2008/2009 through 2020/2021?

Demographic data were analyzed according to certain available variables between undergraduate and graduate completers who sought licensure to teach K-12 Business Education. The variables analyzed for both undergraduate and graduate licensure completers included gender, cumulative undergraduate GPA, cumulative credit hours earned at the time of graduation, age at the time of graduation, undergraduate major, and state where the completer was originally from. Variables that were also analyzed, but specific only to undergraduate licensure completers, included a declared undergraduate minor and if they completed the Honors program as part of their graduation requirements. Variables that were also analyzed, but specific only to graduate

licensure completers, included their route (student teaching or Intern) and if they were an alumnus of the university completing a second-degree program. Altogether, 66 undergraduate licensure completers and 50 graduate licensure completers were included in the study among the school years of 2008/2009 through 2020/2021. Also, 37 undergraduate licensure completers were male while 29 licensure completers were female, and 29 graduate licensure completers were male while 21 licensure completers were female.

Results indicated that undergraduate licensure completers were likely to have an average undergraduate GPA of 3.49 ($SD = 0.23$), completed 138.58 cumulative undergraduate credit hours ($SD = 13.17$), with an average age of 23 ($SD = 3.99$), and graduated during the 2008/2009 school year. Further results indicated that graduate licensure completers were likely to have an average undergraduate GPA of 3.22 ($SD = 0.47$), have an average graduate GPA of 3.83 ($SD = 0.22$) completed 130.14 cumulative undergraduate credit hours ($SD = 11.98$), and have an average age of 30 ($SD = 8.80$), and have graduated during the 2020/2021 school year. All results of the study can be found as tables in the appendices.

Table 1. Shared variables analyzed

Variable	Gender	Undergrad GPA	UG. Cred. Hrs.	Age at the time of completion	UG. Major	State
UG. Completers	Male: 37	<i>M:</i> 3.49	<i>M:</i> 138.58	<i>M:</i> 23.20	BE: 64	PA:
	Female: 39	<i>SD:</i> 0.23	<i>SD:</i> 13.17	<i>SD:</i> 3.99	BE/Span: 1	62
		Median: 3.49	Median: 136.00	Median: 22.00	BE/Econ: 1	NJ: 3
		Mode: 3.47	Mode: 136.00	Mode: 22.00		DE:
		Max: 3.98	Max: 175	Mode: 22.00		1
		Minimum: 2.98	Minimum: 120	Max: 46		
				Minimum: 21		
Grad Completers	Male = 29	<i>M:</i> 3.22	<i>M:</i> 130.14	<i>M:</i> 30.40	Market.: 21	PA:
	Female = 21	<i>SD:</i> 0.47	<i>SD:</i> 11.98	<i>SD:</i> 8.80	Mgmt*: 13	50
		Median: 3.22	Median: 126.00	Median: 27.00	Acct.: 8	
		Mode: 3.00	Mode: 122.00	Mode: 24.00	Finance: 7	
		Max: 3.96	Max: 175	Mode: 24.00	ITM: 4	
		Minimum: 2.35	Minimum: 116	Max: 56	Busin.: 1	
				Minimum: 22	Econ.: 1	
					Techn. Lead: 1	
					Comm. Stud.: 1	
					Pastoral: 1	
					Para. Leg. Stud: 1	
					Psychology: 1	

Note: “BE” stands for “Business Education”; “Market.” stands for “Marketing”; “Mgmt” stands for “Management”; “Acct.” stands for “Accounting”; “ITM” stands for “Information Technology Management”; “Busin.” stands for “General Business”; “Econ.” stands for “Economics”;

“Techn. Lead” stands for “Technical Leadership”; “Comm Stud.” stands for “Communication Studies”; “Para. Leg.” stands for “Paralegal Studies”;

Note: Mgmt includes General Management (11), Sport Management (1), and Supply Chain Management (1)

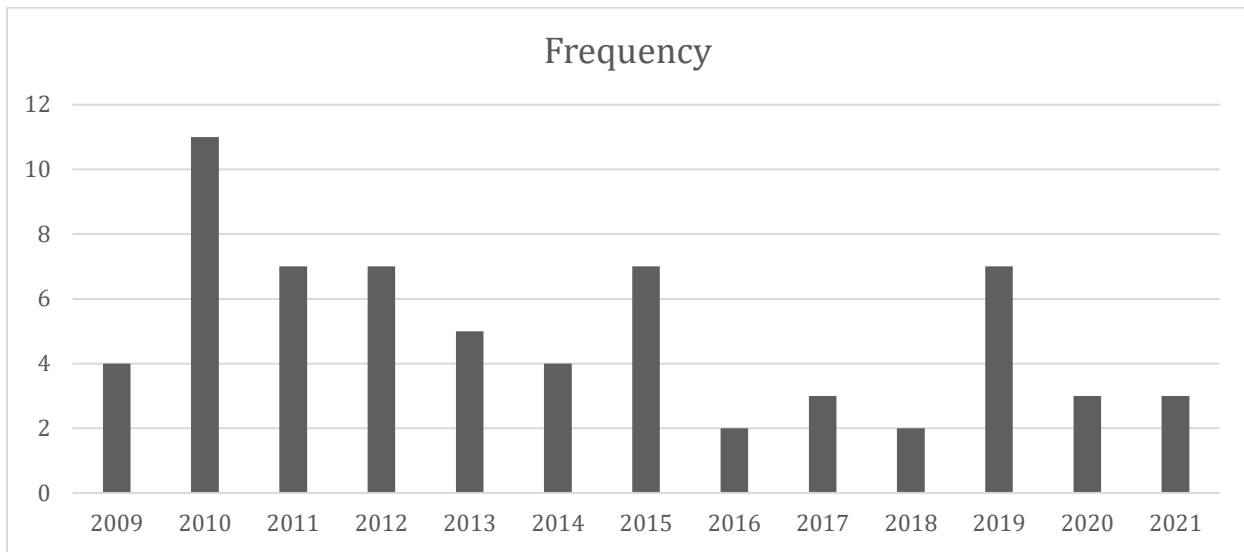
Note: Some students were double-majors, which is why the majors total may not add up to 50 (the graduate licensure completers sample size completion number); there were eight graduate licensure completers who were double-majors.

Table 2. Other variables analyzed

Variable	Honors?	Undergrad. Minor	Grad GPA	Route	Alumnus?
Undergraduate Completers	Y: 2 N: 64	None: 36 ITA: 11 Busin.: 9 Special Ed.: 3 BIS: 1 Music: 1 Leg. Stud.: 1 Spanish: 1 Accting: 1 Biology: 1			
Grad Completers			M: 3.81 SD: 0.22 Median: 3.93 Mode: 4.00 Max: 4.00 Minimum: 3.93	Stud. Teach: 43 Intern: 7	Y: 41 N: 9

Notes: “ITA” stands for “Information Technology and Analytics”; “Special Ed.” stands for “Special Education”; “BIS” stands for “Business Information Systems”; “Leg. Stud.” stands for “Legal Studies”; “Accting” stands for “Accounting”; “Stud. Teach” stands for “Student Teaching”

Graph #1. Graduation years for undergraduate licensure completers



Graph #2. Graduation years for undergraduate licensure completers

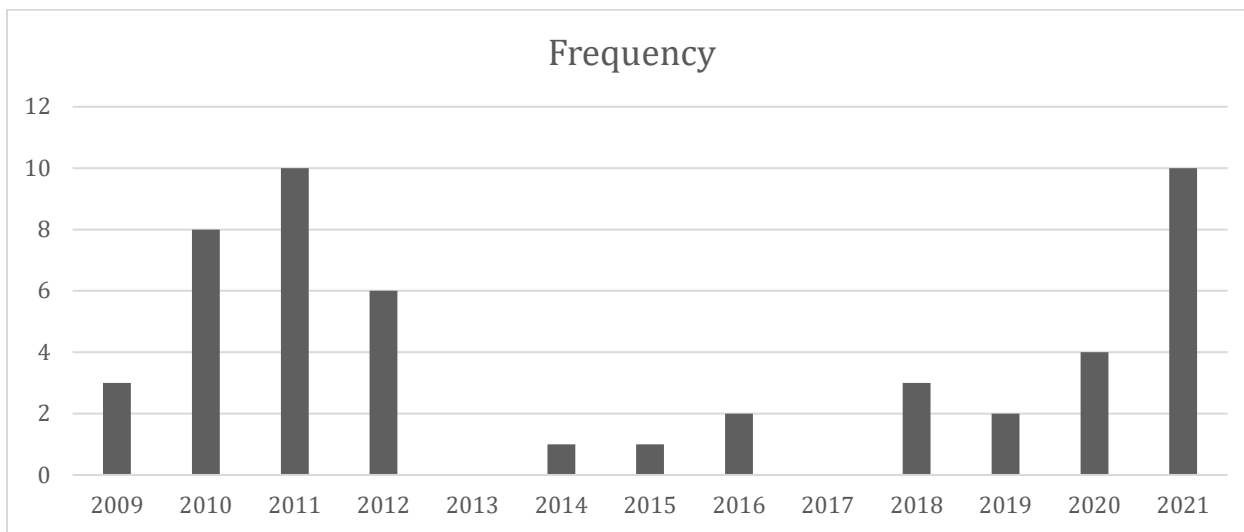


Table 5. Gender trend data

Variable	Average Gender GPA	Average Gender Grad GPA	Average Gender Credit Hrs.	Average Undergrad. Age
Undergraduate Completers	Male: 3.43		Male: 139.48	Male: 23.00
	Female: 3.55		Female: 138.10	Female: 23.00
Grad Completers	Male: 3.25	Male: 3.83	Male: 130.60	Male: 30.00
	Female: 3.24	Female: 3.85	Female: 129.88	Female: 30.00

What trends emerged from this data to describe business education completers seeking licensure during these years?

Results of the study highlighted some notable trends between undergraduate and graduate licensure completers. Some of the trends include differences in GPA between males and females, most likely graduation for both undergraduate and graduate students, and where the pipeline of new students is currently originating, among other trends.

Trend #1: Differences in gender among undergraduate GPA, graduate GPA, cumulative undergraduate hours earned, and age at the time of graduation

There was a noticeable difference between male and female undergraduate GPA for those who were undergraduate licensure completers. Male licensure program completers had on average a 3.43 GPA and female licensure program completers had on average a 3.55 GPA, indicating a difference in average GPA of 0.12.

There were no sizable differences between graduate male and female licensure completers in relation to the variable of undergraduate GPA for both undergraduate and graduate students, with males having an average of a 3.25 undergraduate GPA and females having a 3.24 undergraduate GPA. Additionally, results indicated that there were no sizable differences between male and female undergraduate and graduate licensure completers among the variables of cumulative undergraduate hours earned, age at the time of graduation, or graduate cumulative GPA.

For the variable of cumulative undergraduate hours earned, undergraduate males completed on average 139.48 credit hours and undergraduate females completed on average 138.10 credit hours, indicating a difference of 1.38 cumulative credit hours between each gender for undergraduate students. For graduate students, males completed on average 130.60 cumulative undergraduate credit hours, while females completed 129.88 credit hours on average, indicating a difference of 0.72 cumulative credit hours between male and female graduate students.

For the variable of age at the time of graduation, both male and female undergraduate students were on average the age of 23, indicating no difference in age for undergraduate males and females. Graduate students were on average the age of 30, indicating no difference in age for undergraduate males and females.

There was not much of a difference between male and females on gender and GPA. For the variable of graduate GPA, males had on average a final GPA of 3.83, while females had on average a final GPA of 3.85, indicating a difference in average GPA of 0.02.

Trend #2: Graduation years for undergraduate and graduate students

Results of the study concluded which years produced the largest number of undergraduate and graduate licensure completers starting with the 2008/2009 school year through the 2020/2021 school year. Also, for both undergraduate and graduate licensure completers, there was a greater likelihood of completing licensure requirements later in the dataset, and one occurrence of completing licensure requirements more recently in the dataset (during the 2018/2019 school year).

For the undergraduate licensure completers, there was a higher frequency of completers during the later years of the dataset 2008/2009 school year ($n = 11$), and 2010/2011 school year and 2014/2015 school year, and during the school year of 2018/2019 ($n = 7$).

For the graduate licensure completers, there was a higher likelihood of completers later in the dataset during the 2009/2010 school year ($n = 8$), 2010/2011 school year ($n = 10$), and 2011/2012 ($n = 6$), and again earlier in the dataset during the 2020/2021 school year ($n = 10$).

Trend #3: Licensure completers: Decreases in one category, an increase in another

A trend discovered in the data included a steady decrease in undergraduate licensure completers later in the dataset, and an increase in graduate licensure completers choosing to pursue the Internship route, a form of alternative licensure. For the undergraduate licensure completers, there was a trend towards a decrease in graduation rates later in the dataset starting with the 2015/2016 school year though the 2020/2021 school year, except for the 2018/2019 school year (on average, 2.6 undergraduate licensure completers not including the 2018/2019 school year).

For the graduate licensure completers, a large majority of completers choose to complete the traditional pathway (also known as the “student teaching route”), but there was a noticeable trend towards completing the Internship route (a form of alternative licensure). Throughout most of the dataset, graduate licensure completers chose to pursue the traditional pathway, however, during the 2019/2020 school year, the Internship route started showing an increase in graduate licensure completers. The results suggested that there may be a trend towards graduate students pursuing licensure requirements may pursue an alternative pathway, completing licensure completers while beginning their teaching careers in lieu of student teaching.

Findings

The results of the study provided a snapshot of the demographic background of an undergraduate licensure completer. An undergraduate licensure completer was likely to be female ($n = 39$, or 59%), have an average final undergraduate GPA of 3.49 ($SD = 0.23$), have completed an average of 138.58 credit hours ($SD = 13.17$) be an average age of 23 ($SD = 3.99$), only major in Business Education, originate from the state in which the teacher education program is located, not complete an honors type program, not pursue a minor, and have graduated during the 2009/2010 school year. This information corresponds to the literature regarding teachers in general since there are more females in the profession and traditional students complete their teaching degree by 22 to 23 years of age (Ingersoll et al., 2018; Aldeman, 2019). To a lesser extent, further analysis revealed that there were undergraduate licensure completers who double-majored in Business Education and Accounting ($n = 1$) or Business Education and Spanish ($n = 1$) and pursued a minor in Information Technology and Analytics ($n = 11$), General Business ($n = 9$), or Special Education ($n = 3$).

The results of the study provided a snapshot of the demographic background of a graduate licensure completer. A graduate licensure completer was likely to be male ($n = 29$, or 58%), have an average program and graduate GPA of 3.22 ($SD = 0.47$), have an average final graduate GPA of 3.81 ($SD = 0.22$), have completed an average of 130.14 credit hours ($SD = 11.98$), be an average age of 30 ($SD = 8.80$), have an undergraduate major of marketing ($n = 21$), originate from the state in which the teacher education program is located, completed the student teaching

route for licensure, and was not an alumnus of the university with the approved teacher education program, and have graduated during the 2010/2011 school year or during the 2020/2021 school year ($n = 10$ for each).

Limitations

The first limitation that may affect the study included a smaller sample size. It should be noted that a smaller sample size during the school years was used in the study, which may in turn affect generalizability. Also, the results of the study may only be generalizable to the population used in the study; however, the results of the study provide baseline data describing the demographic background of both undergraduate and graduate licensure completers. An overarching goal of the study was to establish baseline data regarding the demographic profile of Business Education completers and the study incorporated as many completers as possible and data that were readily available for the study.

In addition to a smaller sample size, another limitation is the scope of the study. The researchers sought to only describe demographic data and not explore implications of the results of the study. Since this was descriptive data, it would be suggested that an area of future research include further exploring implications using other forms of quantitative and qualitative methodologies. A follow up study could explore the data and further uncover deeper trends than those described in this study. No correlation analysis was performed on the data to explore relationships within the data, which is another suggested area for future research purposes.

The last limitation is the availability of variables in the study, which also served as a delimitation. An exhaustive literature review was performed before attempting the research study, and reviewing which data were maintained throughout the duration of the included school years. A limitation of the study was the availability of variables that could be included in the analysis. In future research studies, it is suggested to expand the availability of variables to include an even richer description of the demographic background of undergraduate and graduate completers. Such future demographic variables could include if a student is from another country (from an international perspective), race, income level, or marital status.

Recommendations

The demographic data and trends that were derived are most pertinent for teacher educators, program coordinators, and teacher education preparation programs that lead to Business Education licensure within the elementary, middle, and/or secondary level(s). A demographic profile described for both undergraduate and graduate licensure completers, providing data to teacher educators and program coordinators about who is most likely to enroll in a Business Education licensure program. It is recommended that teacher educators, program coordinators, and teacher education preparation programs that need licensure use the data as a guide for recruitment and retention initiatives. This can serve as a *wakeup* call for program coordinators when it comes to recruitment and retention efforts for undergraduate and graduate students interested in pursuing Business Education licensure.

Another recommendation is to continue to update these data longitudinally beyond the scope of the included school years and nationally. Tracking licensure completers will help program coordinators know key information about their students, including recruitment efforts and

preferred methods of completing a licensure program. Results of the study showed a decrease that remained steady for undergraduate licensure completers, while a steady pipeline of graduate licensure completers. This information can assist program completers with gauging recruitment efforts for undergraduate licensure completers and making program adjustments, if needed, for graduate licensure completers. Tracking the data can also continue to uncover trend data, which may change as we get closer to 2030 and beyond.

A third recommendation is to continue to actively recruit, in states in which this is an option, personnel from business and industry who would be willing to enter the teaching profession immediately as a lateral-entry teacher. This recommendation also echoes the findings of a study by Shuls & Ritter (2013), about purposefully aiming recruitment efforts towards teachers who may prefer certain route types. It was further suggested by Shuls & Ritter (2013) that some teachers could be recruited to teach certain grades levels, such as a traditional pathway for teachers who tutor elementary-aged students, and an alternative pathway for teachers who tutor secondary-aged students.

Conclusions

For graduate licensure completers, there was a noticeable increase in those pursuing licensure requirements through the Internship route, which is a form of alternative licensure (Pennsylvania Department of Education, 2021). Some studies have found that alternative licensure completers, originating from the field of career and technical education, are just as prepared for teaching as those who completed a traditional licensure pathway (Nye, et al., 2004; Shuls & Trivitt 2015; Stronge et al. 2011). The findings would suggest that graduate students may want to pursue a form of alternative licensure as lateral-entry teachers to enter the class. For vacant P/K-12 Business Education positions that may otherwise go unfilled, alternative licensure in lieu of a traditional pathway may be more desirable to fill positions.

It can be concluded from the results of the study that although a majority of undergraduate licensure completers opted not to pursue a minor, however, for those licensure completers who did complete a minor, the most popular minor was Information Technology Management (or Information Technology and Analytics) ($n = 11$), followed by General Business ($n = 9$), and Special Education ($n = 3$). There were also some undergraduate licensure completers who completed a major not associated with business or education, such as Music, Spanish, and Biology ($n = 1$ for all). This conclusion suggests that undergraduate business minors, when selecting a minor, generally prefer minors that would most likely not be housed in the College of Business or College of Education, with some pursuing a minor that is directly associated with either College.

It can be concluded from the results of the study which undergraduate major was most popular for graduate licensure completers. The results suggested that the major of Marketing ($n = 21$) was the most popular undergraduate major, followed by Management ($n = 13$), Finance ($n = 8$), and Accounting ($n = 7$). Other majors that were pursued by licensure completers as an undergraduate student, who would not be housed in the College of Business or College of Education, included Technical Leadership, Pastoral Studies, Paralegal Studies, Communication Studies, and Psychology ($n = 1$ for all). It was also indicated that eight graduate licensure completers chose to double-major as an undergraduate student. This study was significant in that much of the data related to teaching is generalized and not specific to specialties. This research

aims to provide those involved in preparing business education preservice teachers with some expectations as to demographics, GPA, credits, gender, and age. This information can help to improve recruitment and program design.

Final thoughts/Areas for future research

The results of the study provide an overview snapshot of Business Education completers from a university in north-central Atlantic region. This study was important to establish baseline data about the background of current and future business education teachers, and to start to communicate important and available demographics to stakeholders. The conclusions and recommendations help to shine a light on *who* is choosing to enter the teaching profession, with an emphasis on the field of Business Education teachers. It is also suggested that future studies focus on other variables, and perhaps even an international focus, to continue to describe the demographic backgrounds of business education teachers. Other institutions that offer degree and/or licensure programs in Business Education programs should continue to explore and even replicate this type of study to further learn more insights about the demographic backgrounds of this important field in education. Furthermore, it may be beneficial to understand *why* individuals are entering the field of business education. This study indicated an increase in graduate enrollment and decrease in undergraduate enrollment. In addition, graduates who enter the profession seem to be those with a marketing background. Understanding *why* an individual selects business education may lead to more successful recruitment efforts.

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Roofing Career Path Exploration

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Introduction

This article provides factual information for those interested in a career in roofing. Useful information, such as pay and benefits, have been provided in this article to help those trying to decide if a roofing career is a good fit. Details regarding this career will be presented in the following order: responsibilities, how to become one, pay and benefits, job outlook, and an interview with a current roofing professional.

Responsibilities of a Roofer

A roofer maintains, inspects, repairs, and replaces the roofs of residential homes and commercial buildings (Better Team, 2021, para. 1). The U.S. Department of labor (2021) further specifies responsibilities of roofers to include installing insulation to protect buildings from weather. A roofer will need to document repairs performed and conditions of a roof (Skills Provisions, 2020). Roofers work outdoors under various weather conditions, and they may work limited hours during winter months in colder climates (U.S. Department of Labor, 2021).

How to Become a Roofer

In order to become a roofer, applicants must be willing to learn the necessary skills to properly install and maintain roofs. According to the U.S. Department of Labor (2021), a roofer will often receive on the job training to learn the trade, since no formal education is required.

Apprenticeships are available to teach new roofers installation techniques, quality management, material selection, roof inspection processes and roof installation skills (Career Explorer, 2021, para. 4). The wide variety of roof types means that it may take years for a roofer to become competent for all job scenarios. Certifications are available to demonstrate competency and knowledge of specific aspects of roofing (Stuart, 2020, para. 1). Experience is required in order to sit for many of the certification exams.

It is important for a roofer to be comfortable working at great heights for an extended period of time. A roofer relies on excellent balance when working on steep roofs to avoid falls (U.S. Department of Labor, 2021). Other useful skills for a career in roofing include good attention to detail when following blueprints, basic math skills, manual dexterity to handle roofing materials, and the physical strength to lift materials and necessary tools (Stuart, 2020, para.5).

Pay and Benefits

According to the U.S. Department of Labor (2021), the median yearly wage for a roofer was \$43,580 in May 2020. Salary.com (2021) reports a median annual wage of \$36,743 for roofers in April 2021. The typical pay range for a roofer as of April 2021 was between \$33,168 and

\$41,154 (Salary.com, 2021). The pay and benefits of a roofer can vary based on experience, certifications, and location.

Job Outlook

The U.S. Department of Labor (2021) predicts a growth in roofing jobs from 161,600 in 2019 to 165,400 in 2029; this equates to a 2% job growth over the ten-year period. Career Outlook (2021) predicts a job growth from 160,600 roofing positions in 2018 to 179,000 jobs in 2028. This data indicates a stable employment market for those entertaining a career in roofing.

Interview with Steven Daniel Walden from McGuff Roofing, Inc. of Muncie, Indiana which offers roof installation and repair services. They are located at 610 E Wyser Street. in Muncie, Indiana. They can be reached at (765) 808-0854. This interview was completed by Dr. Edward J. Lazaros on June 3, 2021. The interview along with the responses are listed in the following sections:

Figure 1: Steven Daniel Walden pictured in front of a contractor's truck



1. What previous experience prepared you for this position?

“When I was younger, I started working construction. I started doing this ever since I graduated high school. I started out doing painting and then worked for some brick layers. In 1993, I transitioned to roofing” (Steven Daniel Walden, personal communication, June 3, 2021).

Figure 2: Steven Daniel Walden pictured in front of a ladder that allows access to the roof that he is working on replacing.



2. What does a typical workday look like for you?

“We get up about 4:30 AM in the morning and figure out if we are going to work based on the weather. Everything is based on the weather. We meet at the shop and gather materials and fill up our water jobs. We drive to the job site which sometimes can be an hour away. We work between 8-12 hour days depending on how things go. If we are there later than that, things typically haven’t gone well”(Steven Daniel Walden, personal communication, June 3, 2021).

Figure 3: Steven Daniel Walden pointing at the rain clouds that often impact when they are able to work on roof jobs.



3. What is your favorite part about your daily work?

“Being outside is my favorite part! I also like how the scenery changes. Once we finish a job, we start at a brand new location. We never get tired of being in the same place”(Steven Daniel Walden, personal communication, June 3, 2021).

Figure 4: Steven Daniel Walden pointing at a new PVC roof that was just installed



4. What are the main challenges you encounter with your daily work?

“The main challenge is the weather. When it starts getting hot, rain can pop up out of no where. Having to coordinate with other trades can also be a challenge at times. Getting people to work can also be a challenge” (Steven Daniel Walden, personal communication, June 3, 2021).

Figure 5: Close-up picture of the new PVC roof that was just installed.



5. What kinds of fun technology do you get to use?

“We have a welder that does long laps for us. It is robotic and just needs to be guided. The laps are heat welded sections of roofing, which are ten feet each. Each seam has a three inch lap. The robot heats the roofing material to 1148 degrees and welds the two sections together. We

can set the robot to different materials and also make adjustments based on the temperature and weather” (Steven Daniel Walden, personal communication, June 3, 2021).

6. What advice would you give someone who would like to get into this career?

“You have to have a good work ethic. You have to be able to get up in the morning to be able to be at work at 4:30AM in the morning. This is a great way to make a living and you can move up quick. If you want to learn and work hard, you can move up the ladder quickly. I became a roofing foreman in just two years due to the turn over rate. There is also an apprenticeship program that people should consider. For example, our registered apprenticeship program is through an organization called ABC. There is a curriculum that people follow. The apprenticeship program allows someone to get their apprenticeship card” (Steven Daniel Walden, personal communication, June 3, 2021).

Conclusion

A roofer helps maintain, inspect, repair, and replace the roofs for commercial and residential buildings. Those who decide to pursue a career in roofing will have the opportunity to learn on the job. The projected job growth for roofing professionals in the years to come indicates a stable job market.

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National Testing: Academic Achievement of CTE and Non-CTE Graduates

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Abstract

Career and Technical Education (CTE) programs at secondary and post-secondary levels are growing in popularity and enrollment. Evaluating the merit of educational programs is a required practice. This study examined the academic achievement of certified CTE high school graduates and non-CTE high school graduates in Nevada as measured by nationwide college testing. Results indicate ($p < .001$) that CTE certified students had statistically significantly higher ACT scores on the ACT composite, reading, math, science, and English assessments than those of general academic student graduates who took one or no CTE courses. Empirical studies have found CTE attracts a diverse audience of students including those who are economically challenged and historically perform at lower academic levels. The difference found in this study in which CTE certified graduates accomplished ACT composite scores 9% higher than non-CTE graduates deserves special attention given additional external challenges many CTE students experience. This study also illuminates the importance of students making serious commitments and seeing their CTE commitment through to certification.

Introduction

Within the Clark County School District (CCSD), the fifth largest school district in the nation consisting of 320,000 students, more schools are adding career academies within traditional high schools in addition to designated Career and Technical Academy schools. Advising and recruiting students to engage with CTE and complete a pathway to a career is a worthwhile and possibly life-changing experience for a student unaware of locally accessible opportunities. CTE certification opens the door to career opportunities and increased academic achievement, thus opening more doors to competitive colleges seeking students with higher grades and assessment marks on national academic examinations. There is a small but increasing literature base examining the academic performance of students who complete CTE pathways. These studies demonstrate a two-fold benefit to the CTE student: 1) student graduates with technical and employability skills which employers seek; and 2) improved and superior course and assessment marks when compared to general academic students who do not engage with CTE programs (Michaels & Barone, 2020). This study further explores the academic achievement of CTE students in one of the nation's largest school districts. The school district contains a well-developed CTE mission which has been tried and tested for decades.

Statement of the Problem

This study is continuation and expansion on a growing body of research examining and monitoring the progression of the CTE mission in the western United States. As more and more CTE programs are introduced and existing programs are refined, there is the ongoing need to determine how students who have completed a CTE pathway perform on state-mandated examinations required for graduation. High school programs and courses lose enrollment unless they can demonstrate the program contributes to academic success (Blowe & Price, 2012).

Many CTE courses are correlated academically to core classes such as English, mathematics, and science; thus, the curriculum covered in many CTE courses overlaps with content covered in core courses. A simple example of the overlap which could occur is a welding project. Students in a welding course are tasked with submitting a building plan for constructing a 10-foot-high fence surrounding a property. The plan asks students to include how much time and building materials need to be purchased to complete the project. In this situation, welding students would need to utilize drafting, geometric, and arithmetic skills taught in a core math classes. They also are tasked with effectively communicating the plan which taps into skills taught in core English and writing classes. This project examines bridges which occur between CTE and core academic settings—and how those bridges affect academic mastery.

Purpose of the Study

The purpose of this study was to investigate the academic achievement of CTE certified graduates and non-CTE graduates in the fifth largest school district in the United States. Students must pass an end-of-program Technical Assessment, a Workplace Readiness assessment, and maintain passing grades in their CTE pathway courses to receive certification. The academic subject areas covered in this study include: 1) science; 2) English; 3) reading; and 4) mathematics. By examining and reporting CTE students' performance on nationwide college-ready assessments, local career programs gain quantifiable and statistically significant evidence CTE certification influences core subject masteries.

As more industries shift towards automation and the need for specialized workers grows, Career and Technical Education (CTE) programs are ideal for supplying companies with qualified employees who are trained for modern and cutting-edge professions. Because states play a large role in developing and overseeing CTE programs, they carry the responsibility of maintaining a continuous research agenda to ensure that the CTE programs in which students enroll are high quality and will provide the opportunities students are promised (Jacob, 2017). High quality CTE programs may provide students with: 1) employment and internship opportunities; 2) newly gained knowledge of trades and skills available; 3) comradery with fellow CTE peers; 4) improved academic achievement; and 5) motivation to stay in school and perform better in academic courses.

Significance of the Study

Despite large and regular investments made in CTE over the decades, there is a paucity of research on the impact of CTE on high-stakes testing. For example, on July 31st, 2018, President Trump signed the Strengthening Career and Technical Education for the 21st Century Act, a \$1.2 billion program last overhauled by Congress in 2006. For decades, billions of US taxpayer dollars have been invested annually into CTE. Federal legislation has promoted CTE since its

inception and continues to mandate the operation of CTE programs. However, few state and collegiate studies have been conducted to evaluate the merit of CTE federal legislation with regards to academic progress and state-mandated examinations such as the ACT. This study answers demands to continually monitor the merit of educational programs offered to high school students along with examining student achievement of CTE students in one of the largest school districts in the nation.

Literature Review

Although CTE courses use structured contextual learning similar to the training found in workplaces, CTE courses are often understood by students as elective courses designed to explore career options instead of focusing on one career sequence which leads to employment. This tendency for students to choose CTE courses only as electives creates difficulty for policy makers, educators, and teachers who are evaluating whether CTE pathways are contributing to goals set by legislation. Legislative goals may include factors such as an increased graduation rate, increased GPA marks, and adequate testing averages. Many educators have generally acknowledged skills acquired in CTE courses, experiential learning common in CTE, and career exploration driven by CTE, but they seldom receive a confirmation as to academic skills and knowledge built and strengthened in CTE courses. Perkins II and III grants supported the goal of encouraging CTE students to make a commitment by concentrating on one program area and completing certification in skill areas offering employment opportunities. Perkins II and III CTE funding opportunities were designed to promote school implementation and participation in “sequences” of CTE courses. The aim in modifications of the Perkins educational grants was to reverse the trend of students simply “exploring” CTE programs with limited interest and commitment, but instead to promote a culture of CTE “concentration” (Gordon & Schultz, 2020).

CTE Increases Student Achievement: State and District

When students concentrate on and complete CTE pathways it provides states with qualified employees and has a positive influence on student achievement. This effect was noticed by Castellano et al. (2012). Although the researchers could not verify differences in student achievement between 9th grade CTE students and 9th grade non-CTE students, by the conclusion of 10th grade student test scores, grade point averages, and progress towards graduation trended better for CTE students. The implications from the research outlined how CTE concentration cultivated a unique atmosphere of success, determination, and commitment. Researchers in Florida studied the assessment patterns of over 80,000 CTE students as they advanced in CTE pathways. Results revealed that performance on a state science test improved as a student’s coursework in a CTE program increased beginning with CTE samplers (1 to fewer than 3 occupational credits) through CTE concentrators (3 or more credits in at least one occupational area) (Israel et al., 2012).

Blowe and Price (2012) were motivated to study CTE student achievement upon realizing the *No Child Left Behind* legislation did not include CTE. The researchers analyzed 131 school divisions in the Commonwealth of Virginia covering the 2008, 2009, and 2010 school years. Their findings indicated CTE completers significantly outperformed non-CTE completers as measured by 11th grade reading and mathematics passage rates as well as higher graduation rates for CTE students. In a similar study in Northern Nevada where the researchers studied the student

achievement of CTE completers and non-CTE students in a large western school district, CTE completers had statistically significantly higher ACT scores on the ACT composite, reading, writing, math, science, and English assessments than those of general academic student graduates who took one or no CTE courses. The difference found in this study of CTE graduates accomplishing ACT composite scores 4% higher than non-CTE graduates deserves special attention given the additional external challenges many CTE students experience (Michaels & Barone, 2020). Palmer and Gaunt (2007) found CTE students often come from lower-SES brackets than non-CTE students, who frequently come from economically advantaged backgrounds. Additionally, Palmer and Gaunt (2007) found many CTE students experience non-traditional living arrangements. These studies were the motivation for diving deeper into studying CTE student achievement by again utilizing the national ACT examination as the measuring instrument for gauging academic mastery in one of the nation's largest school districts with well-developed CTE programs.

The results of the 2017 Phi Delta Kappa (PDK) poll overwhelmingly showed strong public support for high schools positioning and preparing students for their adult working lives in addition to educating them in academic subjects. Highlights from the 2017 PDK poll include: 1) 82% of Americans encourage career and job skills even if it translates to students spending less time in academic classes; 2) 89% believe that schools in their community should offer licensing and certificate granting programs which students can utilize for employment in a field; and 3) 80% view technology and engineering courses as vital components of school quality (49th Annual PDK Poll, 2017).

CTE in the fifth largest school district

The Clark County School District in the state of Nevada reflects national dispositions and commitments to CTE. The district in its entirety serves over 320,000 students and over half of the high schools are designated as magnet schools or career academies. Both types of schools offer career pathways and certifications which lead to employment. Annually, Clark County graduates approximately 30,000 high school students with over 10 percent of graduates obtaining CTE certification in combination with their high school diplomas (CCSD, 2022).

CTE programs are available across the state and increasing with popularity. Although there is abundant access to CTE programs for students located in metro-urban areas, providing access to students living in rural locations is an ongoing challenge. During the 81st legislative session in 2021, several bills were passed which will have positive impacts for Nevada's students, educators, and families. Specifically, Assembly bill 38 revises provisions related to CTE. Bill 38 reduces previous burdens which created difficulties for school districts to engage stakeholders when attempting to implement and improve CTE programs (Demerjian, 2021). Many industries have a vested interest to help build CTE programs in already existing and established school districts and local colleges. These CTE programs become a cultivating and training arena from which companies hire from. Local industry professionals serve in an advisory capacity and monitor curriculums, trainings, and assessments of their future employees. This bill reduces bureaucratic hurdles school districts have faced when seeking partnerships with local industries.

Nevada has demonstrated year after year its commitment to the CTE realm of education. Regular legislative sessions include CTE when educational matters arise, regular and noticeable CTE

investments are made statewide. During the 2020 fiscal year, Nevada collected \$11.4 million dollars via Perkins V funding. Prior to the COVID pandemic, Nevada collected \$36.4 million total from federal and state funding during the 2016 and 2017 biennium (Perkins Collaborative Resource Network, 2021).

Method

This study continues the new and interesting trend of researching the student achievement of CTE students, specifically, researching if the curriculums and tasks associated with CTE transfer to high stakes testing situations where the general academic skills of English, math, science, and reading are the focus. This is worthy of continued investigation to justify the existence and expansion of CTE programs in American schools. The focus of the study was to gauge the impact of CTE certification and non-CTE participation in Southern Nevada on the ACT assessment covering science, mathematics, reading, and English. The research findings offer stakeholders an inside look as to the effectiveness and merit of their local CTE mission.

Research Question 1: Are there statistically significant mean differences on the Composite ACT scores for CTE certified high school graduates and non-CTE general academic high school graduates? The composite score is the average of four ACT tests: English, mathematics, reading, and science.

Research Question 2: Are there statistically significant mean differences on the English ACT scores for CTE certified high school graduates and non-CTE general academic high school graduates?

Research Question 3: Are there statistically significant mean differences on the Math ACT scores for CTE certified high school graduates and non-CTE general academic high school graduates?

Research Question 4: Are there statistically significant mean differences on the Reading ACT scores for CTE certified high school graduates and non-CTE general academic high school graduates?

Research Question 5: Are there statistically significant mean differences on the Science ACT scores for CTE certified high school graduates and non-CTE general academic high school graduates?

Study Sample and School District Profile

A very large western school district with a well-developed CTE endorsement system for high school students was the setting for this study. The district serves over 320,000 students total across 360 schools. The district contains 49 high schools where 34 of the high schools are designated as *magnet schools* and *career and technical academies*. Both magnet schools and career and technical academies offer CTE pathways leading to certification.

The study sample involved approximately 30,000 graduated high school student ACT scores from the school district. From the 30,000 students, 3,285 were CTE certified, had undertaken the ACT examination, and had graduated high school. These 3,285 students were compared to 3,285 non-CTE high school graduates who also undertook the ACT examination. The 3,285 non-CTE graduates were selected at random from the original target population of 30,000. The CTE certified graduates successfully obtained high school CTE credentials in one of the following program clusters: 1) Agriculture and Natural Resources; 2) Architecture and Construction; 3)

Arts, A/V technology and Communication; 4) Business Management and Administration; 5) Education and Training; 6) Finance; 7) Government and Public Administration; 8) Health Science; 9) Hospitality and Tourism; 10) Human Services; 11) Information Technologies; 12) Law, Public Safety, Corrections, and Security; 13) Manufacturing; 14) Marketing; 15) Science, Technology, Engineering, and Mathematics; and 16) Transportation, Distribution, and Logistics. Convenience sampling recommended by Creswell & Creswell (2018) was the sampling strategy used for this study. The 2019 graduation cohort was selected for this study.

Data Collection

This study was a joint project conducted by members from the University of Nevada - Reno, University of Nevada - Las Vegas, and the College and Career Readiness department within the Clark County School District. Every year, high schools across Nevada administer the ACT during the winter season. Nevada high schools administer and collect testing data in accordance with national ACT protocols. The ACT is the leading college admission test measuring students' academic progress and their ability to complete college-level work. The ACT surpassed the Scholastic Aptitude Test (SAT) in total test takers and all four-year colleges and universities in the US accept the ACT (ACT, 2018). Nevada is one of 25 states requiring students to undergo the ACT to graduate high school (State of Nevada Department of Education, 2012). The ACT is regarded as a high-stakes assessment because it is linked to important outcomes such as students receiving a high school diploma, locating employment, and future educational placements (Yell, Katsiyannis, Collins & Losinski, 2012). High achievement on the ACT examination could lead to a student securing enrollment at a competitive university which they have worked tirelessly to be accepted into. For these students, the ACT will likely be the most important high-stakes assessment they have ever faced.

Research Design

This project employed quantitative research methodologies in determining if there were statistically significant differences between CTE certified high school graduates and high school graduates who undertook one or no CTE courses during their high school careers. The study analyzed differences in student achievement as measured by ACT scores for CTE-certified high school graduates and high school graduates who were non-CTE participants. A one-way MANOVA statistical test and five univariate ANOVA tests were employed (Field, 2009).

Data Analysis

Microsoft Excel and IBM's *Statistical Package for the Social Sciences* (SPSS) were used to conduct calculations. Statistics were generated for the combination of all ACT scores, the ACT composite score, and each individual ACT score by subject area. Descriptive statistics such as averages and standard deviations were studied first to provide a general understanding of the data before searching for statistical significances.

The MANOVA analysis was used to evaluate whether the test averages between the two cohorts (CTE certified and non-CTE) posted differences of statistical significance. In simpler terms, the researchers were curious to investigate if there were score average cohort differences and if there were differences, were they random or was there a certain factor creating higher scores in one cohort. After locating statistical significance using the stringent alpha level of ($\rho < .001$), it was clear there was a phenomenon occurring commanding further investigation. After locating high

significance on the combination of dependent variables, independent ANOVA tests were run to locate specifically which dependent variables were posting significances. The same stringent p level of .001 was used during the ANOVA tests. Permission to conduct the study was obtained from the participating universities and school district.

Results

The descriptive analysis provided an overview of the data. The data for this study included 6,570 cases with five scores attached to each case. There were 3,285 CTE-certified high school graduate cases (50%) and 3,285 general high school graduate non-CTE cases (50%). The mean scores of the CTE certified graduates and non-CTE students indicated students who underwent and completed a CTE pathway through certification had higher mean scores on the dependent variables in comparison to the general non-CTE students. Specifically, CTE certified high school graduates had a mean score of 20.71 out of 36 on the ACT composite score whereas general academic high school graduates had a mean score of 17.17. CTE certified high school graduates had a mean score of 19.76 out of 36 on the ACT English score whereas general academic high school graduates had a mean score of 15.95. CTE certified high school graduates had a mean score of 20.36 out of 36 on the ACT Math score whereas general academic high school graduates had a mean score of 17.44. CTE certified high school graduates had a mean score of 21.30 out of 36 on the ACT reading score whereas general academic high school graduates had a mean score of 17.48. CTE certified high school graduates had a mean score of 20.78 out of 36 on the ACT science score whereas general academic high school graduates had a mean score of 17.22. Please see Table 1 for a graphical display of means and standard deviations for ACT composite score, ACT Math score, ACT Science score, ACT English score, and ACT Reading score by student type.

Table 1. Means and standard deviations for ACT composite score, ACT Math score, ACT Science score, ACT English score, and ACT Reading score by student type

Assessment	Student Category	M	SD
ACT Composite	CTE Certified	20.71	4.40
	General Student	17.17	4.52
ACT English	CTE Certified	19.76	4.59
	General Student	15.95	5.06
ACT Math	CTE Certified	20.36	4.67
	General Student	17.44	4.21
ACT Reading	CTE Certified	21.30	5.86
	General Student	17.48	5.76
ACT Science	CTE Certified	20.78	4.55
	General Student	17.22	4.76

Overall Combination MANOVA—RESULT

MANOVA results revealed statistically significant mean differences with a large effect among the type of high school student graduate (CTE certified vs. general academic high school graduate) on the combination of dependent variables [Pillai's Trace, $V = .148$, $F(5, 6564) = 228.9$, $p < .001$, multivariate $\eta^2 = .148$].

RESEARCH QUESTION 1—RESULTS

After it was discovered there is a statistically significant difference on the combination of ACT scores, individual analysis of variance was conducted on each ACT component. Questions one through five are the results of the individual analysis of each ACT score.

Are there statistically significant mean differences on the Composite ACT scores for CTE certified high school graduates and non-CTE general academic high school graduates? The univariate test on the individual ACT composite dependent variable revealed statistically significant mean differences with a large effect between the two groups of students [$F(1, 6568) = 1033.167$, $p < .001$, partial $\eta^2 = .136$]. Therefore, CTE curricula influences student achievement in the academic subjects of English, reading, mathematics, and science as measured by national testing.

RESEARCH QUESTION 2—RESULTS

Are there statistically significant mean differences on the English ACT scores for CTE certified high school graduates and non-CTE general academic high school graduates? The univariate test on the individual ACT English dependent variable revealed statistically significant mean differences with a large effect between the two groups of students [$F(1, 6568) = 1021.837$, $p < .001$, partial $\eta^2 = .135$]. Therefore, CTE curricula influences student achievement in the academic subject of English as measured by national testing.

RESEARCH QUESTION 3—RESULTS

Are there statistically significant mean differences on the Math ACT scores for CTE certified high school graduates and non-CTE general academic high school graduates? The univariate test on the individual ACT Math dependent variable revealed statistically significant mean differences with a medium to large effect between the two groups of students [$F(1, 6568) = 708.920$, $p < .001$, partial $\eta^2 = .097$]. Therefore, CTE curricula influences student achievement in the academic subject of math as measured by national testing.

RESEARCH QUESTION 4—RESULTS

Are there statistically significant mean differences on the Reading ACT scores for CTE certified high school graduates and non-CTE general academic high school graduates? The univariate test on the individual ACT Reading dependent variable revealed statistically significant mean differences with a medium effect between the two groups of students [$F(1, 6568) = 810.942$, $p < .001$, partial $\eta^2 = .110$]. Therefore, CTE curricula influences student achievement in the academic subject of reading as measured by national testing.

RESEARCH QUESTION 5—RESULTS

Are there statistically significant mean differences on the Science ACT scores for CTE certified high school graduates and non-CTE general academic high school graduates? The univariate test on the individual ACT Science dependent variable revealed statistically significant mean differences between the two groups of students [$F(1, 6568) = 1033.169$, $p < .001$, partial $\eta^2 = .128$]. Therefore, CTE curricula influences student achievement in the academic subject of science as measured by national testing.

Summary

Using a one-way MANOVA, the research questions examining differences in student achievement between CTE certified graduates and non-CTE graduates were answered. The effects of student type (CTE or general) on the dependent variables were reviewed from Pillai's Trace. The results indicated there were significant effects of student type on all dependent variables. Based on the MANOVA findings, five one-way univariate ANOVA tests were conducted. All five ANOVA tests yielded statistically significant results indicating student type influenced all ACT scores.

Findings, Implications for Further Research and Reflections

The purpose of this quantitative study was to investigate the academic performance of CTE-certified high school graduates and non-CTE high school graduates in the Clark County School District as measured by the ACT composite, math, science, English, and reading scores. This study examined ACT assessment scores submitted to the Department of Education for the entire

graduating class of 2019 in the nation's fifth largest school district covering over 40 high schools in the state of Nevada. There was one independent variable with two levels based on CTE concentration status: 1) CTE certified high school graduate; and 2) non-CTE participant high school graduate.

The focal point of this research project was to continue evaluating whether CTE concentration and certification is a productive educational endeavor which contributes to academic masteries required by national testing. The notion that CTE helps job-related skill development and exposure is well understood; this research base illuminates the academic effect of CTE certifications educational institutions offer. The study is intended to be a resource to supply quantifiable data to schools when making decisions regarding curriculum and program evaluation.

Discussion of Findings

First, in the study populations CTE certified graduates earned significantly higher average scores on all ACT subject areas measured in this study. More specifically and focusing on what colleges and universities review when evaluating applications for admittance; the ACT composite score for certified CTE graduates was 9.8% percentage points higher than non-CTE graduates for the 2019 Clark County graduating class. These results suggest that CTE-certified graduates outperform their non-CTE counterparts across core subjects taught in America's pk-12 schools and colleges. Secondly, the subject areas where differentials between CTE certified graduates and non-CTE graduates were greatest were English and reading. CTE-certified graduates averaged scores on ACT English and reading which were over 10% points higher than non-CTE graduates. ACT science scores were 9% points higher for CTE-certified graduates and ACT math scores approximately 8% points higher. Thirdly, statistical significance with a medium to high effect was located for each research question. This confirms and validates the hypothesis that there is a phenomenon occurring when students complete and receive CTE certification, and the phenomenon is driving up scores on important and determining assessments.

Implications for Practice

The results of this project signal that CTE certification has a large effect on student achievement and college preparation. When local schools and school districts make decisions regarding CTE maintenance, reduction, expansion, or improvement, the results from this study should be reviewed as it clearly displays CTE certified graduates achieve significantly higher test scores at crucial junctions. It can be assumed if CTE certified graduates are accomplishing higher assessment marks on national examinations, they are accomplishing higher semester grades in their high school courses, thus, posting higher overall Grade Point Averages.

Previous research and sentiments report mixed reviews regarding the academic culture and achievement of students who pursue occupational tracks while in high school and college. Negative outlooks regarding occupational tracks have been common for decades and have served as stimulus and motivation to conduct this project in Nevada. The researcher's curiosity prompted this investigative study which fulfilled the goal of investigating how CTE certified students are performing on well-known and established academic assessments. CTE programs are said to be modernized and academic when compared to their predecessor known as vocational education. This project helps validate claims that CTE programs have evolved to

become modern and cutting-edge with the additional benefit of significantly boosting academic achievement across core subject areas.

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Market Research Analyst Career Path Explanation

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Introduction

The purpose of this article is to provide detailed information for people interested in market research analysis. In this article, there is information about how to become a market research analyst, the required responsibilities of the position, the average yearly pay, and the job outlook. This article also includes an interview with a professor from Anderson University who conducts market research analysis as a career outside of teaching.

Responsibility of Market Research Analyst

As referenced by the U.S. Bureau of Labor Statistics (2021), market research analysts analyze and study the market conditions for products and services before they are put on the market. Figuring out the market conditions entails a variety of facets. As a company, it is crucial to understand what kind of products customers want, what is the target audience for the products or services and what prices they should be sold at (U.S. Bureau of Labor Statistics, 2021). Market research analysts analyze data collected through surveys, questionnaires, opinion polls, focus groups, and other sources of information with the purpose of understanding their target audience's buying habits, interests, preferences, and demographics (U.S. News & World Report). This research helps companies determine what products and services to sell, how to select their advertising channels, and determine their price points (Indeed Editorial Team, 2021).

In order to communicate their findings in ways that a company can easily understand, market research analysts need to have analytical and creative skills to create charts, graphs, infographics, and other visual aids to show the results of their findings after doing the appropriate research (U.S. Bureau of Labor Statistics, 2021).

How to become a Market Research Analyst

Based on the U.S. Bureau of Labor Statistics (2021), those who want to become a market research analyst will need to have a bachelor's degree in one of the following fields: market research, social science, or anything related to business and communications. Important courses that students should consider are statistics, research methods, marketing, economics, and consumer behavior (U.S. Bureau of Labor Statistics, 2021).

Leadership positions or positions that entail technical research will require a master's degree in marketing research, statistics and marketing, or an MBA (U.S. Bureau of Labor Statistics, 2021). On the other hand, certifications are voluntary; however, certificates are a great way to gain experience, skills, and industry knowledge to better operate in a market research analyst role (Indeed Editorial Team, 2021). As indicated by the U.S. Bureau of Labor Statistics (2021), a good certificate to have is the Professional Researcher Certification (PRC) offered by the Marketing Research Association. In order to qualify for the certification, candidates must pass an exam, have at least three years of experience in the field, and complete twelve hours of industry-

related education courses. Candidates that desire to renew their certificate must complete twenty hours of industry-related education course every two years (U.S. Bureau of Labor Statistics, 2021).

As a market research analyst, it is crucial to have analytical skills in order to succeed in this profession; however, Carrie Mesrobian from Rasmussen University suggested some additional skills that market research analysts should have; the first one is storytelling. After collecting and analyzing data, market research analysts should have the ability to make inferences and draw conclusions in order to effectively interpret and synthesize data for the company to make a decision. The second skill Mesrobian suggests is communication and interpersonal skills. Being able to effectively explain complex information to stakeholders is key for this position (Mesrobian, 2021). Professionals should have the ability to easily communicate their findings, suggestions, and concerns to the rest of the company.

Market research analysts often do not know what kind of data the company wants to find; therefore, critical thinking is an important skill to possess. Market research analysts must think critically about how to turn available data into useful insights and results. The next skill Mesrobian suggests is attention to detail. In order to collect data, analysts will create surveys and questionnaires; consequently, it is important that they pay close attention to the wording of each question since it might alter the answers of the participants and affect the final results (Mesrobian, 2021). Additionally, market research analysts that work with big data should have the ability to dig and find useful insights that might benefit the company and its market goals (U.S. Bureau of Labor Statistics, 2021). Market research analysts should have the desire to find the problem or the solution to any situation; moreover, Carrie Mesrobian suggests that the last skill market research analysts should have is problem solving (Mesrobian, 2021).

Pay

In May 2021, the average salary wage for a market research analyst was \$63,920. The salary can fluctuate between companies; therefore, the minimum salary for a market research analyst can be \$37,570, and the highest can earned more than \$128,320. As part of the job, analysts are required to work regular business hours; however, they might be required to work extra hours to complete the projects on time (U.S. Bureau of Labor Statistics, 2021).

Job Outlook

According to the U.S. Bureau of Labor Statistics (2021), employment for market research analysts will grow 22% from 2020 to 2030. Based on this percentage, it is predicted that there will be approximately 96,000 job openings each year for this position. Compared to other occupations, market search analyst jobs are growing at a faster pace, since big data analysis is becoming increasingly popular among companies (U.S. Bureau of Labor Statistics, 2021). By 2019, there were 345,000 market research analysts in the United States. Of those 345,000, interestingly 60% are female and the other 40% are male (Data USA). Additionally, insight provided by Zippia regarding diversity among market research analysts indicates that 68.4% are White, 13.4% are Asian, 10.4% are Hispanic or Latino, 5% are Black or African American, 2.6% are unknown, and 0.2% are American Indian and Alaska Native (Zippia).

Interview with Victoria, a professor at Anderson University and a self-employed Market Research Analyst



1. What previous experience prepared you for this position?

I would say two things. The first one is my education; I earned an undergraduate degree in Marketing and a master's degree in international management. My graduate program was a Master of Science which was inclined towards data analysis. During this program, I used R, which is a data analysis platform that allowed me to do a lot of projects related to data analysis. The second thing that prepared me for this position is that I have done a lot of consulting. When it comes to research, as an analyst or when working directly with a client you always must know what the business goal is, and what you are really trying to accomplish. By doing this, it allows you to really understand what business owners and managers are really thinking and why they are doing research in the first place.

2. What does a typical workday look like for you?

My case is a little different than a normal market research analyst position. I am a professor full-time; however, I do my research for my clients as a side gig. So, I would say that a typical day for me when I am not at school, especially over the summers, is very much like being self-employed. I do everything from talking to my clients, to doing research, and conducting interviews to gather more information and data. When doing research, I would use databases such as Google, marketing reports, and third-party research. There is a lot of writing involved. In some cases, design can also be involved depending on how you want to show all your findings to your clients.

What I really enjoy about this career is that there is always a question that I am trying to solve by doing research and each client always brings a completely different problem to solve, which makes the job interesting and fun.

3. What is your favorite part about your daily work?

I like seeing what problems or goals my clients have, and I like being able to give them the tools to solve those problems or reach those goals. This is a reason why I decided to become a teacher as well since I like to empower people, so they can solve their problems and by doing research. I get to empower and help people in a unique way. Consequently, research can be a little more challenging since the answers are not always there. It becomes like a puzzle where you need to put the pieces together in order to find solutions, however, they might be many pieces that can fit in different forms. As a market research analyst, one needs to be okay with ambiguous answers.

4. What are the main challenges you encounter with your daily work?

There are two kinds of research one can do, qualitative and quantitative. Most of my research leans towards a qualitative perspective. One of the biggest challenges is to get into the right room with the right people. For example, I often interview a client with their customers, which can become very time-consuming, since in some cases you need to get approval from the CEO in order to talk to some big customers. In this position, you face a lot of challenges regarding time and accessing people.

Another challenge in this career is that sometimes you do not know what you do not know, so must time you have to poke holes in your own research and determine what you are missing in order to find the solutions you are seeking. In some cases, you do not have the right tools, information, or scales to conduct your ideal research, so you must adapt your research to the resources you have available and try to get as much data as possible.

5. What kinds of fun technology do you get to use?

It depends on the area of specialization. For example, someone building a survey may use tools like Qualtrics or QuestionPro, which are more industrial software packages used to create surveys. More basic tools can also be used, such as SurveyMonkey or Google Forms. Another technology that I get to use is interview transcribers, such as Trint. With this software, I can record an interview on my phone and then convert it into a transcript. This tool is extremely helpful when I have multiple interviews in a row, and I do not have enough time to write all of them down.

There are the tools that I use on a day-to-day basis; however, those who work for a larger company will have specific data programs such as Tablou, which is a corporate data platform to conduct market research. In general, the bigger the company, the more tools you will have at your disposal to conduct research.

6. What advice would you give someone who would like to get into this career?

I would give two pieces of advice for people who want to become a market research analyst. The first one is to always stay curious. Being curious is the nature of the job. If you are not curious, the job will get boring very quickly. My second piece of advice is to be okay with more than one right answer. With a quantitative/mathematical mindset, people tend to think there is always a

right and a wrong answer; however, you might have a number of answers. You do not always understand why you got certain numbers or what exactly you did in order to get those numbers. As a market research analyst, you must be okay with having multiple answers and not having a black and white mindset.

Conclusion

Market research analysts conduct a variety of surveys, interviews, and data research to examine the market conditions for the sale of a product or service. By conducting research, market research analysts can provide customers with the necessary tools and information that they require in order to solve a specific problem. People who are passionate about solving problems and have strong analytical skills could benefit from this career path.

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