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Comparison of Annual Performance Report Results of Central Appalachian Upward Bound Programs during 2017-2022 Grant Cycle

Zachary Hudson Hess
Eastern Kentucky University, z.hudson.hess@gmail.com

COMPARISON OF ANNUAL PERFORMANCE REPORT RESULTS OF CENTRAL APPALACHIAN UPWARD BOUND PROGRAMS DURING 2017-2022 GRANT CYCLE

BY

ZACHARY HESS

THESIS APPROVED:

DocuSigned by:
Ann H. Burns
DCB8D3239B2C440...
Dr. Ann Burns
Chair, Advisory Committee

DocuSigned by:
Jason Miller
38D5E9E893F849F...
Dr. Jason Miller
Member, Advisory Committee

DocuSigned by:
April Blakely
6781564817D1490...
Dr. April Blakely
Member, Advisory Committee

DocuSigned by:
Ryan K. Baggett
734DC952EE294C2...
Dr. Ryan K. Baggett
Dean, Graduate School

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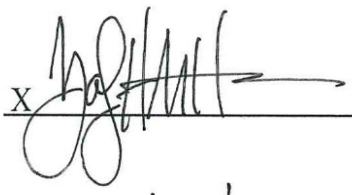
X 

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BY

ZACHARY HESS

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ABSTRACT

Participation in higher education affords low-income students with a pathway out of poverty. The federally funded Upward Bound program aims to improve the college-going rate of low-income and first-generation students. Relevant studies have demonstrated the effectiveness of the program. There is a gap in the research regarding whether some types or properties of certain Upward Bound programs are more effective in meeting programmatic objectives than others. The purpose of this study was to compare the effectiveness of the different summer program models utilized by Upward Bound programs. The data for this quantitative study was the Annual Performance Report results of Central Appalachian Upward Bound programs during the 2017-2022 grant cycle. ANOVA tests conducted for objectives one, three, and six indicated that there is no significant effect of summer program type on these three objectives. ANOVA tests conducted for objectives two, four, and five found that summer program type significantly impacts performance data on these three objectives. These findings indicate that the success of Central Appalachian Upward Bound students is greater when their program utilizes a non-residential summer program model.

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I. Introduction

Participation in higher education typically affords low-income students with a pathway out of poverty. Individuals within this population, however, enroll in higher education at a considerably lower rate than their middle and upper-class peers (Jean, 2011; Castleman et al., 2012). In order to address this discrepancy, abundant financial resources are invested into college access programs for secondary school students, such as the federally funded Upward Bound (UB) program, which aims to improve the college-going rate of low-income and first-generation students.

The Department of Education (ED) oversees all, individual UB programs and their assessments of the overall program, as well as additional studies related to UB, have demonstrated the general effectiveness of UB in meeting its objectives (Laws, 1999). Nevertheless, the vast majority of prior research was designed to measure and gauge the success of individual UB programs or to ascertain the merit of the UB initiative in its totality. There is a dearth of studies comparing individual UB programs with others and, notably, comparing the effectiveness of certain aspects of different UB programs. This has resulted in a gap in knowledge regarding whether some types or properties of UB programs are more effective in meeting programmatic objectives than others.

This is a noteworthy question to answer since the cost as well as the potential impact of these programs is immense. In fiscal year 2020-2021, a total of 70,711 high school students participated in a UB program with at least two-thirds of these individuals being both a low-income and a first-generation college student (U.S. Department of Education, 2021a; Dortch, 2020). These students' participation is not

realized without substantial financial investment. UB services in fiscal year 2020-2021 were provided at an expense of $352,094,127 to taxpayers (U.S. Department of Education, 2021a). UB programs positively impact a significant number of students but do so at a significant cost.

The purpose of this study was to compare the effectiveness of the different summer program models utilized by UB programs. Study participants included UB programs located within the Central Appalachian region and their effectiveness was compared utilizing the numerical data produced by the required Annual Performance Report (APR). This data was analyzed using an ANOVA statistical test to assess the hypothesis that there is a significant difference regarding the success in meeting program objectives of the different summer program models. Plentiful research has been conducted, over UB's many decades of existence, demonstrating the program's wide-ranging success in assisting low-income and first-generation students in successfully completing high school and being accepted into and attending higher education. There is an insignificant volume of research, however, that compares the effectiveness of the different summer program models utilized by UB programs with most related research designed to gauge the effectiveness of individual programs or of the program in general.

This was a worthwhile topic to explore due to the fact that, if there is a specific summer program model that produces meritorious results, further research can be conducted into what precisely makes it more effective and/or new UB grants can elect to utilize this model due to its demonstrated primacy. Researching ways to possibly improve UB is rational since the program has demonstrated success over several

decades. Any identified improvements would require simply modifying an already successful intervention rather than forming a wholly new and unproven one.

In addition to more effectively investing taxpayer dollars, improving UB programs would also better serve the disadvantaged population of UB participants. This is a worthwhile endeavor since low-income and first-generation students, especially those from Appalachia, encounter significant barriers when attempting to enter and be successful in higher education. This research was correspondingly valuable due to the fact that, as Rosecrance et al. (2019) note, there is insufficient research related to the college-going rates and the attitudes towards college attendance of Appalachian students. This study contributed to the gap in research comparing UB programs with one another as well as added to the deficient number of studies related to Appalachian students. This chapter will serve as an introduction to the study by providing relevant background and contextual information, by presenting the research problem and research aims, and by discussing the study's limitations.

Background and Context

UB is a product of President Lyndon Johnson's War on Poverty and the accompanying Economic Opportunity Act of 1964 (Hampson, 2014; U.S. Department of Education, 2011). Soon after its establishment, Bybee (1969) described UB as an "educational attack" on poverty. Since its inception nearly sixty years ago, research has been conducted to assess the effectiveness of the program with the majority of studies demonstrating its success (Blake, 1998; Laws, 1999). These studies range from national evaluations of the UB initiative to evaluations of individual programs. Since the overwhelming majority of this research has focused on individual UB programs or on

the general, nationwide success of the program, the result is a gap in research regarding whether some UB program models are more effective than others.

The purpose of this study was to compare the effectiveness of the different summer program models utilized by UB programs in the Central Appalachian region by using the numerical data produced by the required APR in order to address this gap in knowledge. The APR is a standardized report which produces numerical data regarding the program's effectiveness on six objectives and is completed by every Upward Bound program yearly. The existence of this report, which negates the need to create a new instrument for the study as well as the fact that it produces numerical data, is justification for utilizing a quantitative research methodology for this study.

The results produced by this study are of value due to the fact that it was discovered that some summer program models were more successful in meeting program objectives than others. Thus, further research can be conducted regarding what precisely makes them more effective, and new UB grants can elect to adopt this model due to its demonstrated primacy. Thus, the disadvantaged population of UB participants, which totaled 70,711 in fiscal year 2020-2021, can be better served and $352,094,127 of taxpayer dollars can be more effectively invested (U.S. Department of Education, 2021a; Dortch, 2020).

The feasibility of comparing UB programs was realized due to the fact that all programs complete the same, standardized annual report. To complete this study, APR data from the 2017-2022 grant cycle was collected from UB programs located within Central Appalachia and compared to that of other programs. The fact that the APR is a

standardized instrument that produces numerical data is the justification for utilizing a quantitative research methodology for this study.

The theoretical framework of Self-Determination Theory (SDT) provided a theoretical context for the study. Ryan and Deci (2000) argue that fulfillment of the specific needs of autonomy, competence, and relatedness leads to personal growth, social development, and an overall increase in well-being. In an educational context, positive outcomes result when students feel effective at tasks, are allowed to make choices, and experience a sense of belonging. UB's overall mandates and structure inherently address these three needs which may serve as an explanation regarding the program's ongoing success and the notable achievements of its students. A UB summer program model was determined to be more effective in meeting APR objectives than others, so it is possible that this model more adequately addresses participants' needs for autonomy, competence, and relatedness through its unique method of providing the required services. This is an area for potential, further research.

Research Problem and Questions

Upward Bound is a massive initiative that served 70,711 students in fiscal year 2020-2021 through an allocation of $352,094,127 in taxpayer dollars (U.S. Department of Education, 2021a; Dortch, 2020). The vast majority of research over the last fifty years gauging UB's success has demonstrated the effectiveness of the program as a whole (Blake, 1998; Laws, 1999). Absent from the literature, prior to this study, were studies comparing individual UB programs, so it was unknown if a certain summer program model was more successful than others.

Researching the efficacy of college access programs was noteworthy since higher education often affords low-income students with a pathway out of poverty. Assisting students in obtaining a college degree was the main objective of the 966 UB programs across the country operating during the 2017-2022 grant cycle. All 966 of these individual programs are structured similarly due to possessing the same objectives and mandates established by ED such as the requirement that they provide instruction in math, laboratory science, composition, literature, and foreign language during the summer component (U.S. Department of Education, 2021c).

An aspect in which UB programs vary relates to the structure of their summer program. While all programs must provide a six-week summer program, a program's summer component can be residential, non-residential, or mixed. Thus, while meeting the same general requirements, this is one of the notable variances among UB programs (Gandara & Bial, 2001). While their research is dated, Burkheimer et al. (1976) described the variance with which UB programs meet program objectives as "extensive" stating that they found more variance than commonality among each program's specific interventions. It is unknown if these variances result in one summer program model being more successful than others.

Due to this gap in knowledge, the purpose of this study was to compare the effectiveness of the different summer program models utilized by UB programs in the Central Appalachian region by using the numerical data produced by the APR. Since the APR consists of numerical data, the study utilized a quantitative research methodology. The Central Appalachian subregion was selected for this study since educational attainment in the area is markedly lower than that of the Northern and

Southern Appalachian regions with Appalachia as a whole performing poorly compared to the rest of the country (Shaw et al., 2004). The following research question guided this study:

RQ1: There is a significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

$H1_0$: There is no significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

Justification

In fiscal year 2020-2021, a total of 70,711 high school students participated in a UB program (U.S. Department of Education, 2021a). At least two-thirds of these individuals are both a low-income and a first-generation college student (Dortch, 2020). These two groups experience extensive barriers when attempting to enroll in and be successful in higher education (Balz & Esten, 1998). Fortunately, UB's long-running success with assisting these populations is well-documented though, notably, the overwhelming majority of related research has focused on individual UB programs or on the general, nationwide success of the initiative (Blake, 1998).

UB's success is not achieved without a cost. Services in fiscal year 2020-2021 were provided at a charge of $352,094,127 to taxpayers (U.S. Department of Education, 2021a). The results produced by this study are of value due to the fact that it discovered that some summer program models were more successful in meeting program objectives than others. Thus, further research can be conducted regarding what precisely

makes them more effective. New UB grants can elect to adopt this model due to its demonstrated primacy or it could be mandated as a research-based guideline from ED. Thus, UB's numerous, disadvantaged participants can be better served, and taxpayer dollars can be more responsibly utilized.

The feasibility of comparing the effectiveness of UB programs was aided by the fact that all programs complete the same, standardized annual report. The APR produces numerical data regarding each program's success in meeting six objectives. The existence of this report, which negated the need to create a new or unique instrument for the study as well as the fact that the APR produces numerical data, justified the selection of a quantitative research methodology for the study.

Nature of Study

This study utilized a quantitative research methodology. Each individual UB program may serve hundreds of students, so interviewing sufficient participants from various, different programs in order to determine and compare the effectiveness of the different summer program models was not feasible. The research question was best addressed via a quantitative study. The feasibility of a quantitative study was aided by the fact that all UB programs already complete the same, standardized report which produces numerical data regarding the program's effectiveness. This negated the need to develop a new instrument for the study. Additionally, the APR provides a clear indication regarding whether the program achieved the target percentages, identified in its grant application, on the six objectives listed on the APR. This data can and was directly analyzed and equated with the data of another program(s).

The population for the study consisted of UB programs hosted at colleges, universities, or agencies located within the Central Appalachian region. To collect data for this study, the researcher emailed the director of each UB program hosted at a college, university, or agency located within Central Appalachia and requested the program's baseline data for the six objectives as well as their APR data for grant years two through four. The data for these three years was collected due to the fact that ED does not consider years one and five of the grant cycle when assessing a program's effectiveness.

In addition to this data, each director identified the type of summer program model (residential, nonresidential, or mixed) their program utilizes as well. The directors were able to submit this information via a Google Form, the link for which was included in the email. The UB programs that completed the form were the participants utilized for the study. Collected data was analyzed using an ANOVA test and, when necessary, a post-hoc test, etc. This process compared the effectiveness of the different summer program models utilized by UB programs located within the Central Appalachian region and identified if there was a significant difference among the models regarding their success in meeting APR objectives.

Terms

Annual Performance Report – A required, yearly report submitted by UB programs to the Department of Education to determine grantee's progress in meeting its identified objectives (U.S. Department of Education, 2020c).

Appalachian Region – An area consisting of 206,000 square miles that includes 423 counties in thirteen states stretching from southern New York to northern Mississippi.

The region is characterized by persistent poverty, rampant unemployment, and desolate living conditions (Appalachian Regional Commission, 2017).

Central Appalachia – A subregion of Appalachia that includes counties in Kentucky, Tennessee, Virginia, and West Virginia. Educational attainment in this region is notably lower than that of the Northern and Southern regions (Shaw et al., 2004).

First-generation student – Individual whose parents or primary parent have not completed a baccalaureate degree (Higher Education Amendments of 1998).

Low-income student – Individual with a family taxable income below 150% of the poverty level (U.S. Department of Education, 2021b).

Summer component – Summer instructional program that is designed to simulate a college-going experience for high school students (U.S. Department of Education, 2011a).

TRIO – Eight student service programs that provide services to individuals from disadvantaged backgrounds (U.S. Department of Education, 2020a).

Upward Bound – Federal program providing college-preparatory supports to low-income and first-generation high school students (U.S. Department of Education, 2020b).

Boundaries and Limitations

It is important to note that the demographics of the students in the UB programs utilized in the study varied. Per ED requirements, at least two-thirds of all of the UB students in a particular program must be both low-income and a potential first-generation college student while the remaining one-third must be one of the two (though note that, while it is rare, a program participant may be neither low-income nor

first-generation) (Dortch, 2020). In this regard, the socioeconomic status of the students among the programs were fairly similar and most came from a family where neither parent obtained a college degree. However, differences in the demographic characteristics of the students in each individual program, such as race and gender, were not considered.

Additionally, the research population consisted of UB programs hosted at colleges, universities, or agencies *located* within the Central Appalachian region, but the study did not take into consideration the individual high schools served by each UB program. Thus, some of the APR data utilized in the study may have been generated by students who do not live within the boundaries of the Central Appalachian region. Correspondingly, UB students who live in Central Appalachia were not included in the study if their program's host institution or agency was not, itself, located within Central Appalachia. Furthermore, while the study found that a specific summer program model was more effective than others in meeting the six APR objectives, what specifically makes the model more successful was not identified. It is also important to note that this study's results may not apply to other regions across the country.

Summary

Participation in higher education typically affords low-income students with a pathway out of poverty. In order to assist these students, abundant financial resources are invested into college access programs for secondary school students, such as the federally funded Upward Bound program. The sum of this federal funding is significant, but the vast majority of research has demonstrated the effectiveness of the program (Blake, 1998; Laws, 1999).

The vast majority of these prior assessments were designed to measure and to determine the success of *individual* UB programs or to ascertain the merit of the UB initiative in its totality. There was a dearth of studies that compare UB programs with one another resulting in a gap in knowledge regarding whether some programs' aspects are more effective than others. Perna and Cooper (2005) reiterate the fact that most research addressing the effectiveness of college access programs evaluate the programs as a whole rather than assess the specific components or strategies of individual programs. The fact that this study related to the specific component of summer program model addressed the lack of research in this area and further reinforced the merit of the study.

Chapter 2 of this study will summarize and assess pertinent literature related to first-generation, low-income, and Appalachian students since the majority of the UB students who comprise the programs participating in this study were members of all three of these groups. Chapter 2 will also include a survey of the history and unique aspects of UB as well as contain a summary of the decades of research assessing the success of the program. The theoretical framework for the study will also be reviewed and discussed. Chapter 3 will describe the methodology, research design, and procedures for answering the research question regarding whether there is a significant difference among the effectiveness of the different summer program models utilized by UB programs in the Central Appalachian region in meeting program objectives. Chapter 4 will detail how the APR data of participating UB programs was compared and analyzed and results will be presented through both a written and graphic summary.

Finally, Chapter 5 will present an interpretation of the results of the study, discuss how it relates to the existing body of research, and identify implications for future research.

II. Literature Review

Low-income and first-generation students have traditionally participated in higher education at a much lower rate than their middle and upper-class peers (Jean, 2011; Castleman et al., 2012). Addressing this gap is vital since, as Porter (2015) argues, a college education is almost a necessity for upward mobility, and Jean (2011) contends that education is the only systematic avenue out of poverty. However, since low-income students enroll in higher education at a subpar rate, they forgo the numerous benefits afforded by a college education and the disparities persist between lower-income and upper-income individuals (Castleman et al., 2012; Douglass & Thompson, 2012).

Originating with the Economic Opportunity Act of 1964, TRIO programs emerged as a resource to address this issue by improving the academic success and college-going rate of low-income and first-generation students. In fiscal year 2020-2021, a total of 70,711 high school students participated in a UB program. At least two-thirds of these individuals were both a low-income and a first-generation college student (U.S. Department of Education, 2021a; Dortch, 2020).

If one is going to study and/or evaluate the UB program, it is prudent to appreciate the characteristics of the population that comprises most of the program's participants. Specifically, since UB is a college access program, it is important to identify the specific barriers experienced by low-income and first-generation students and to recognize the additional supports they require in order to achieve postsecondary success (Balz & Esten, 1998). Thus, pertinent literature related to first-generation and

low-income students will be reviewed since these groups encompass the bulk of UB participants.

Since this study also focused on UB programs located in the Central Appalachian region, most students enrolled in the participating programs were Appalachian. Generally, high school students in the Appalachian region have low college-going rates (Hand & Payne, 2008). This has been attributed to the fact that students residing in rural areas typically come from low-income families where parents do not possess a college degree, lack high academic expectations for their children, nor are very involved in their education (Byan et al., 2012). As a result, there is a common overlap between being Appalachian and/or first-generation and/or low-income and, as a result, most students in the UB programs participating in this study fell into all three of these groupings.

While there is plentiful, extant literature related to low-income and first-generation students, Rosecrance et al. (2019) note that there is insufficient research pertaining to the college-going rates and attitude towards college attendance of Appalachian students. Due to this deficiency in research, unfounded stereotypes emerge such as Terenzini et al.'s (1996) assertion that these students possess cognitive skills inferior to those of their peers or the notion that parents in Appalachia are opposed to their children attending college (Hand & Payne, 2008). Thus, literature relating to Appalachian students will also be reviewed in order to obtain an accurate portrayal of this population as well as their unique barriers to and supports for college access and success.

This literature review will also include a survey of the history of UB as well as a summary of the research assessing the success of the program over the many decades of its existence. Throughout the many national evaluations of UB programs, the first of which began in June of 1966, the effectiveness of the program as a whole has been well demonstrated (Blake, 1998; Laws, 1999). As TRIO and Upward Bound professionals like to say, "TRIO Works!"

Additional studies regarding the effectiveness of UB will also be reviewed. As has been previously stated, most of these studies were focused on determining the effectiveness of the UB initiative as a whole or were designed to measure and determine the success of *individual* UB programs. There is a sizable gap in the literature of studies investigating whether some aspects of UB programs are more effective than others.

Theoretical Framework

Ryan and Deci (2000) developed Self-Determination Theory (SDT) which is a framework addressing human motivation and personality. They determined that fulfillment of specific needs leads to personal growth, social development, and an overall increased well-being. The three needs identified by Ryan and Deci (2000) consist of autonomy, competence, and relatedness. They described autonomy as the ability to act independently, competence as feeling confident in one's abilities, and relatedness as feeling connected to others.

Research on SDT has shown that, in school settings, students excel when these three needs are addressed (Ryan & Deci, 2000). Niemiec and Ryan (2009) have additionally found that students from elementary school all the way to higher education experience positive outcomes, including improved academic performance, when

teachers support the concepts of autonomy, competence, and relatedness. Meeting these needs has also been shown to have a positive impact on goal attainment (Ryan et al., 1995). So, generally, positive outcomes come from helping students feel effective at tasks, from allowing them choices, and by fomenting a sense of belonging within the classroom.

Very soon after being established, Bybee (1969) described Upward Bound as a humanistic program. Since then, hope, consistent support, attention to personal circumstances, trust, and respect have been cited as the foundation of the UB program (Blake, 1998; Balz and Esten, 1998). In addition to demonstrating these elements, UB's mandates and structure also inherently address the three needs identified by Ryan and Deci (2000). For example, the program often includes activities that cover goal setting, mindfulness, reflection, problem-solving, decision making, and the program is also well known for promoting an atmosphere of connectedness among students and staff.

The fact that UB inherently addresses the three needs presented by SDT serves as an explanation for the program's long-running success and for the notable achievements of its students. If a UB summer program model is determined to be more effective in meeting APR objectives than others, it is possible that this model more adequately address participants' needs for autonomy, competence, and relatedness through its unique method of providing the required services. While this study will not delve into what specifically contributes to the identified effectiveness of one summer program model versus another, the exemplary model's efficiency in addressing the three needs identified by SDT would be a foundation for future research.

History of Upward Bound

In 1964, President Lyndon Johnson declared his War on Poverty (Hampson, 2014). This initiative would produce the Economic Opportunity Act of 1964 which, in turn, birthed the Federal TRIO Programs (U.S. Department of Education, 2011). UB, the first TRIO program, was established in 1964 when the first eighteen UB grants were awarded (Blake, 1998). The Higher Education Act of 1965 would produce Talent Search, and the Student Support Services program would be established in 1968 (U.S. Department of Education, 2011). These three programs would eventually be known as TRIO (McElroy & Armesto, 1998).

In subsequent years, five additional TRIO programs would be established to provide services to a larger and more diverse group of students (U.S. Department of Education, 2011). Generally, these programs aid low-income and/or first-generation students and program participants range from middle school students to individuals pursuing a postbaccalaureate degree (U.S. Department of Education, 2021c). TRIO grants are primarily awarded to and hosted at colleges and universities, but recipients may include other public and private agencies and organizations (U.S. Department of Education, 2021c).

UB is the largest TRIO program consisting of 966 projects in fiscal year 2020-2021 serving a total of 70,711 high school students (U.S. Department of Education, 2021a). Grant regulations stipulate that at least two-thirds of these individuals must be *both* low-income and a first-generation college student, while the residual one-third must be one of the two (Dortch, 2020). The program's objective is to increase the college-going rate and postsecondary graduation rate of program participants (McElroy

& Armesto, 1998). To accomplish this, UB programs provide academic instruction, cultural enrichment, educational counseling, mentoring, tutoring, work-study programs, etc. (U.S. Department of Education, 2021c). UB services in fiscal year 2020-2021 were provided at a cost of $352,094,127 to taxpayers (U.S. Department of Education, 2021a).

Low-Income/First-Generation Students in the Appalachian Region

ED (2021b) designates a low-income student as someone "whose family's taxable income for the preceding year did not exceed 150 percent of the poverty level amount." This population is targeted for UB's services since low-income students attend college at a subpar rate meaning they forgo the numerous benefits afforded by a college education and the disparities persist between lower-income and upper-income individuals (Castleman et al., 2012; Douglass & Thompson, 2012). There was a time when one's personal, professional, and financial success did not hinge on possessing a college degree (Jean, 2011). However, Porter (2015) argues that a college education is almost a necessity for upward mobility, and Jean (2011) contends that education is the only systematic avenue out of poverty.

While financial aid exists to confront the fiscal challenges often experienced by low-income students, additional supports are required to address the cultural and social barriers hindering these students from postsecondary success (Balz & Esten, 1998). Nunez and Cuccaro-Alamin (1998) determined that low-income students are more likely than their classmates to be first-generation college students. First-generation students are defined as those whose parents do not possesses at least a bachelor's degree (U.S. Department of Education, 2021c). Thus, the majority of low-income students

come from households with limited knowledge regarding and exposure to postsecondary education (Balz & Esten, 1998).

Plentiful research has identified the fact that a parent's educational attainment (or lack thereof) significantly impacts that of their offspring (Hand & Payne, 2008). There are many possible contributors to this reality. Parents with no college or university experience may not understand the intricacies of postsecondary education, may not see the value of higher education, may not be aware of the availability of financial aid, or may simply feel intimidated by the institution of higher education (Balz & Esten, 1998; Nunez & Cuccaro-Alamin, 1998).

Entities outside of TRIO have noticed that, despite the overall increase in enrollment rates at colleges and universities, the admission rate remains low for low-income individuals (Castleman et al., 2012). Castleman et al. (2012) note that considerable research has been conducted regarding the discrepancy in the college-going rate of lower-income and upper-income individuals. Nonetheless, there is a lack of research focusing on the summer between high school graduation and the fall college semester which has been identified as a time when many low-income students decide not to attend college.

Castleman et al. (2012) conducted an experimental study to determine if intervention during this particular summer can reduce the attrition of low-income students. For their study, they utilized a representative sample of recent high school graduates from seven high schools and assigned some members to a treatment group that received college counseling throughout the summer that included assistance with college paperwork, guidance regarding financial aid, and other general help with the

college going process. The study's general research question was to determine whether those who received college counseling over the summer matriculated at higher rates than those who did not. The data collected included transcripts from the students' high schools, content from the counselor's notes, and enrollment data generated by the National Student Clearinghouse. Castleman et al. (2012) discovered that the college attendance rate of students in the treatment group was 14% higher than that of students in the control group. Despite these findings and the well-documented phenomenon of "summer melt," the researchers noted that many colleges and universities do not offer any form of "summer bridge" program. It is especially rare for an institution to offer one focused on low-income and first-generation students.

The Appalachian region of the United States, consisting of 420 counties scattered among thirteen states, is plagued with persistent poverty, rampant unemployment, and desolate living conditions (Appalachian Regional Commission, 2017). Educational attainment in the region is low and the college-going rates of its high school students are correspondingly insufficient (Hand & Payne, 2008). A 2008 study by Hand and Payne attributed the poor academic performance, low college-going rates, and lack of postsecondary success of Appalachian students to barriers other than educational ability. These students possess the ability to be successful in post-secondary education but live in a culture where, according to Bybee (1969,), "the deleterious effects of poverty are transmitted from one generation to the next" (p. 40).

Students residing in rural areas typically come from low-income families where parents neither have high academic expectations for their students nor are they very involved in their education (Byan et al., 2012). This fact negates Terenzini et al.'s

(1996) assertion that low-income, first-generation students possess cognitive skills inferior to those of their peers. The reality is that, despite low college-going rates, the Appalachian region contains an abundance of low-income and first-generation high school students who show promise and simply need services and supports to assist them in achieving their academic goals.

Since students in Appalachia demonstrate the ability to be successful in higher education, it is important to research why their college-going rates are lower than those of the rest of the United States and to identify what factors influence the region's attitude towards higher education. Keefe (2005) identifies Appalachian characteristics such as familism, localism, and self-reliance as possible influences. Youth in rural areas also commonly experience a desire and/or pressure to remain in their community after high school graduation which is another potential factor (Grimard & Maddaus, 2004). As Rosecrance et al. (2019) notes, research regarding the college-going rates and attitudes toward college attendance of rural, Appalachian students is lacking making this an area ripe for further study.

Since being both a first-generation student as well as being from Appalachia present barriers to one enrolling in and being successful in higher education, individuals within both of these populations are particularly disadvantaged. Hand and Payne (2008) conducted a study to better understand the experiences of first-generation, Appalachian college students. They focused specifically on what factors attributed to these students' academic persistence.

In order to conduct this qualitative, phenomenological study, the authors worked with twenty-one students who were participants of an institution's Student Support

Services (SSS) program. A total of 121 potential participants were notified of the study through an email distributed by the Director of the SSS program. Twenty-one students responded to the email and completed the accompanying survey and sixteen of these respondents were selected to be interviewed.

The interviews conducted by Hand and Payne (2008) lasted between 45 and 90 minutes and consisted of open-ended questions. Clarifying and follow-up questions were also utilized as needed. The questions focused on what specific factors led the student to attend college, what helped them persist throughout higher education, and what they personally thought about being Appalachian. All of the interviewees later participated in a focus group as well.

Several common factors emerged as the reasons these students pursued a degree and were retained in higher education. Interestingly and contrary to popular belief, Hand and Payne (2008) found that parents and families were usually very supportive of their student attending college and, throughout the student's childhood, even expressed that they expected them to attend a college or university. Only one student experienced negativity from family regarding their decision to go to college. All other students felt that their parents completely supported their attendance, and, in a way, these students felt they were living out their parents' dreams. Familial support greatly influenced students' participation in higher education as well as their persistence since these students greatly value home and familial ties.

An additional, driving factor that the researchers discovered behind why many first-generation, Appalachian students attend higher education and persist was money. All of the students who participated in the study were from low-income families. As a

result, the researchers found that the students were determined to persist to graduation in order to improve their personal financial situation and to break the cycle of poverty.

Hand and Payne (2008) were transparent regarding the limitations of their study. They noted that their participants were possibly exceptional students since it is more likely that motivated students would respond to a research opportunity. Also, since all of the students who participated were members of the SSS program, these results may not be generalized regarding the students' peers.

Hlinka (2017) also conducted a study researching the factors that led to success and retention in higher education for Appalachian students. The researcher sought to identify the barriers as well as the supports that these students experience along their educational journey. The justification for the study was the claim that broad theories regarding student retention do not account for unique populations such as Appalachian students.

The author conducted their qualitative case-study at Hazard Community and Technical College (HCTC). HCTC is located in Central Appalachia in the state of Kentucky. Hlinka (2017) characterized the landscape of the area as consisting of large family farms.

Thirteen HCTC students were interviewed one-on-one for the study during the spring semester of 2011. The interview was semi-structured consisting of open-ended questions designed to encourage participants to share their personal experiences. After Hlinka (2017) reviewed the transcripts of the interviews, data was assembled into coded categories and key themes were identified. Data was collected and analyzed simultaneously.

Two themes emerged as the driving factors leading students to attend college and to remain enrolled. The primary reason and support were the students' family members who "pushed" them toward higher education and continually encouraged them to persist. Participants attributed these actions to their parents' desire for the students to have a better life than they do personally.

An additional motif identified by Hlinka (2017) was participants' desire to earn a good living. Students understood that a good-paying job or, at least, a job that did not require manual labor required a degree. Notably, most of the participants stated that they desired to find a well-paying job in the region which would allow them to still remain close to home.

While students had familial support and a drive for financial success to motivate them, there was one, identified barrier to their success. Most of the students expressed difficulty in being successful with college-level classwork. In fact, over 60% of the participants in the study were enrolled in a developmental course, typically math, their first semester. Hlinka (2017) attributes their academic struggles to the fact that rural schools often do not focus on the reflective and analytical learning that dominates higher education. In conclusion, the researcher argues that retention strategies and practices need to be focused and/or developed relating to more specific populations, such as Appalachian students, since their needs, supports, and barriers are unique.

Additional research regarding the supports and barriers experienced by first-generation students from Appalachia was conducted by Bradbury and Mather (2009). The authors focused their study on this specific population since both first-generation students as well as those from Appalachia encounter significant barriers to academic

success. Thus, individuals who are members of both of these groups face almost unnumerable barriers.

For their study, Bradbury and Mather (2009) interviewed students attending Shawnee State University (SSU). SSU is an open-admission institution located in southern Ohio. The majority of the university's students are both first-generation and from an Appalachian County.

Participants in the study were, primarily, recruited during the summer orientation sessions conducted in 2007, but additional recruiting occurred in a first-year Psychology class. These recruits were required to meet certain criteria. In order to participate in the study, a student had to be from an Appalachian County, be in their first semester of college, and be first-generation.

The researchers conducted semi-structured interviews with each participant during the fall semester of 2007 to collect data. Follow-up interviews were also completed during the fall semester or during the accompanying spring semester. The interviews were focused on identifying the barriers these students experienced regarding enrolling in and being successful in higher education and, additionally, what elements served as supports.

Following data collection, Bradbury and Mather (2009) wrote a case analysis for each participant before conducting a cross-case analysis. Open coding and axial coding produced categories, patterns, relationships, and broad themes within the data. As a result, the researchers identified the participant's home/family ties, academics, finances, and sense of belonging as the principal factors that supported or hindered their success in higher education.

The support and encouragement of family members served as the primary factor. Fortunately, most of the participants noted that their family and friends were supportive of them attending college and that they encouraged their persistence. These ties also served as a barrier to their success. For example, students were often forced to juggle their academic obligations at the university as well as commitments and connections at home.

Financial matters were also something that Bradbury and Mather (2009) identified as being both a help and a hindrance to these students. Most participants had observed the financial hardship of their parents and were motivated to have a life that was devoid of difficult, low-paying jobs and financial insecurity. Since they came from low-income families, the participants needed to work throughout their higher education career in order to support themselves and pay for their tuition. Thus, time that these students could or should devote to academics was often spent working or fulfilling familial obligations. This negatively impacted their academic success and, due to them spending most weekends at home, impacted their ability to feel a sense of belonging within the campus community.

In another study, Gore and Wilburn (2010) noted that, while there is insufficient research regarding education in Appalachia, there is virtually none that compares academics in Appalachian and non-Appalachian regions from a cross-cultural perspective. They cite the value of such research as relating to the fact that culture and values are not static across the country. For example, many regions embrace more of an individualistic culture while regions such as Appalachia are more collectivistic in nature.

The authors noted that this cultural difference has potential implications on students' academic success. They identified that the norm in most schools in the United States is for students to be encouraged to be independent and to strive for individual achievement. This runs contrary to characteristics of collective cultures that value the social group more than the individual. In fact, Gore and Wilburn (2010) argue that Appalachian college students are most successful academically when they feel a social connection to the college or university.

With this in mind, the researchers hypothesized that they would find a positive correlation between cultural and academic individualism for both Appalachian and non-Appalachian students. It was also anticipated that non-Appalachian students would perform better in academic situations that valued individualistic values. In turn, Appalachian students would be more successful in situations that stressed collectivistic values.

In order to test these assumptions, Gore and Wilburn (2010) conducted two separate studies. One of these was conducted with college students at a university located close to the line dividing the Appalachian and non-Appalachian regions of Kentucky. This participant group consisted of 187 students with 81 of these students being residents of Appalachia and with 106 being from outside the region.

The second study was simply a replication of the first study with a sample of middle school and high school students. Thus, participants in study two were in grades 6^{th} through 12^{th}. This sample consisted of 250 participants where 127 were from the Appalachian region and the remaining 123 participants resided in metropolitan Kentucky.

While the college students completed the survey via an online data collection system and the middle and high school students completed it via a paper-and-pencil version, both versions consisted of a 5-point Likert scale relating to the topics of Cultural Individualism and Collectivism, Academic Individualism and Collectivism, Regional Origin, and Academic Performance. The survey found some similarities as well as some differences between the Appalachian and non-Appalachian students in both surveys. For *both* groups in *both* studies, there was a negative association between Academic Individualism and GPA. In contrast, the association of Cultural and Academic Collectivism in Appalachian college students was insignificant while there was a positive association regarding Cultural and Academic Collectivism for the middle and high school students. Thus, in summary, while the second study produced some similar results to the first study, there were some notable differences between the college and middle/high school students. Gore and Wilburn (2010) attributed this to the possibility that cultural attitudes may become more prominent with age.

Generally, the study's findings were consistent with the expectations of the researchers. Students from individualistic cultures emphasized these values in education. In turn, students with collectivistic attitudes demonstrated these in the classroom. Therefore, the study's results supported the Regional Culture Model of Academic Achievement as well as the notion that Appalachian students are more successful in academic settings that support connection to a larger group.

Gore and Wilburn (2010) were forthright regarding the limitations of their study. The bulk of these critiques were related to the study's instrument. They stated that their survey demonstrated weak inter-item reliability. They also recognized the limitations

inherent in a correlational design when considering the direction of causality. Gore and Wilburn (2010) also claimed that there is a need to conduct similar studies in other states that contain both Appalachian and non-Appalachian areas since their study's results could not be generalized to students outside of the Central Appalachian region of Kentucky.

Further studies need to be conducted that focus on the unique characteristics, needs, and strengths of rural, Appalachian students. Carrico et al. (2019) notes that, while there is extensive research related to K–12 students, these studies are almost exclusively conducted in high-enrollment areas such as urban schools. The authors note that this is understandable given that rural schools are often less accessible than urban schools and that rural schools' lower enrollment negates the ability to conduct quantitative studies in these areas. As a result, many of the educational models and frameworks birthed from these studies did not take rural students into consideration and, thus, may not be appropriate for application to this group of students.

Carrico et al. (2019) conducted a qualitative study related to the career choice of Appalachian high school students since individuals from the region lack representation in higher education and, correspondingly, high-paying and in-demand careers such as engineering. Data collection was achieved through interviews and all of the participants were high school students from the Central Appalachian region. The researchers targeted this specific area for the study since Central Appalachia is the subregion of Appalachia that is most destitute regarding education and poverty.

The precise area where the researchers focused was on the seven, southwestern counties located in the Central Appalachian region of Virginia. The poverty rates within

these counties are considerably higher and the average income considerably lower than the national averages. The research population was eventually narrowed down to four county school systems that were an accurate representation of the seven counties and were also willing to participate in the study.

In order to collect data, Carrico et al. (2019) emailed the principals of each participating high school. The email requested that the school distribute the study's recruitment materials to all juniors and seniors. The recruitment materials explained to potential participants that the research was being conducted to understand what impacted student's decision-making regarding their career choice as well as the fact that the researchers wanted only Appalachian students to participate in the study.

Twenty-four students agreed to be interviewed for the study. The interview consisted of sixteen primary questions as well as supplemental questions related to each primary question. Two interviewers, one male and one female, conducted the interviews over one 45–60-minute class period. What Carrico et al. (2019) hoped to glean from these interviews were the specific influences that prodded participants towards being interested in and planning to pursue a certain career.

Four specific and common influences emerged from the interviews. Students identified the source for their potential career choice as being either personal interest, a life-altering incident, persuasion by someone like a family member, or an individual who assisted the student in linking their general interests to a specific career. Students who participated in the study who did not have a set career direction noted that they planned to review career options while they were in college.

Carrico et al. (2019) notably identified the emerging code of "Appalachian" throughout the interviews. Students expressed that they possessed generational roots in the area which led them to strongly consider careers that would allow for local employment. Notably, 80% of the first-generation students who participated in the study cited their family and/or familial ties as having a significant impact on their educational and career choices. The authors found this notable since most low-income students from urban areas strive to leave their homes while these students in rural Appalachia, in contrast, wanted to remain in the area. Thus, this supports the notion that Appalachian students' educational and career decisions likely deviate from the typical frameworks and career pathways developed from the bulk of educational research which was conducted at urban schools.

The authors were upfront regarding the limitations of their study. Carrico et al. (2019) noted that their study looked at only the potential, desired career of program participants. The study's results are not indicative of whether or not the students actually went to college or really pursued or obtained the identified career. The researchers also noted that, while participants were located in an area of low socioeconomic status, the specific financial situation of the individual participants was not considered in the study.

Synthesis of the Literature

Low-income and first-generation students have traditionally participated in higher education at a much lower rate than their middle and upper-class peers (Jean, 2011; Castleman et al., 2012). As Porter (2015) and Jean (2011) both argue, this is concerning since a college or university degree is almost a necessity for upward

mobility and is possibly the only systematic avenue out of poverty. Without some sort of intervention, the college-going rates of low-income and first-generation students will remain low and the disparities between lower-income and upper-income individuals will persist (Castleman et al., 2012; Douglass & Thompson, 2012).

Balz and Esten (1998), among others, identify that there are specific and unique barriers encountered by low-income and first-generation students that oppose their entry into higher education. These students are doubly disadvantaged since, as a study by Alamin (1998) found, low-income students are more likely to be first-generation students. As a result, the majority of low-income students also come from households with limited knowledge regarding and exposure to postsecondary education (Balz & Esten, 1998).

While there is ample research relating to low-income and first-generation students, Rosecrance et al. (2019) and Gore and Wilburn (2010) note that there are an insufficient number of studies pertaining to the college-going rates of Appalachian students. Educational attainment in the region is low and the college-going rates of its high school students are correspondingly insufficient (Hand & Payne, 2008). Thus, this is an area of research that necessitates an increased focus.

Due to there being an insufficient amount of relevant research, unfounded stereotypes have emerged about Appalachian students such as Terenzini et al.'s (1996) assertion that these students possess cognitive skills inferior to those of their peers. A study by Hand and Payne (2008) attributed the poor academic performance, low college-going rates, and lack of postsecondary success of Appalachian students to barriers other than educational ability. Appalachian students possess the ability to be

successful in higher education, but there is a lack of research into why their college-going rates are lower than those of the rest of the United States. Many of these barriers are similar to those experienced by low-income and first-generation students since there is often an overlap between these three groups.

The limited research into the college-going and persistence rates of Appalachian students has uncovered many common themes as well as debunked several stereotypes about students from the area. For example, it is commonly believed that parents in Appalachia oppose their children attending a college or university. In contrast, studies conducted by Bradbury and Mather (2009), Carrico et al. (2019), Hand and Payne (2008), and Hlinka (2017) all found that their participants' parents were almost universally supportive of their student pursuing higher education and that the parents also served as a factor that contributed to the student's persistence in their academic career. Participants in Hlinka's (2017) study claimed their parents "pushed" them toward higher education and continually encouraged them to persist.

Some of the mostly non-negative stereotypes concerning people from Appalachia were supported by the literature. Studies by Keefe (2005) as well as Grimard and Maddaus (2004) found that participants did, in fact, strongly value family ties as well as feel deeply rooted within their community. They did not, however, desire to simply remain in their community and survive on government assistance as many may believe or claim. Carrico et al. (2019) found that many Appalachian students attend college to obtain careers that would eventually permit them local employment. Students from Appalachia may, in fact, desire to remain a part of their community, but they want to accomplish this while also breaking the cycle of poverty (Hand & Payne, 2008).

Appalachian students do experience some common and often unique barriers which were identified within the literature. Participants in Hlinka's (2017) study experienced difficulty with doing college-level classwork, but this can be attributed to the poor quality of many rural, postsecondary schools. A somewhat unique struggle to this population is, due to them possessing strong commitments and connections at home and also needing to work to pay for college, time that these students could or should devote to academics is often spent working or fulfilling familial obligations (Bradbury & Mather, 2009). This may explain why many Appalachian students struggle academically.

The general lack of research related to low-income, first-generation, Appalachian students means that their unique needs and barriers are misunderstood and understudied. Carrico et al. (2019) argues that the educational models and frameworks often applied within education were born from studies that were not conducted in rural areas nor took into consideration the culture and characteristics of rural students. In conclusion, higher education recruitment and retention strategies need to be focused on and/or developed relating to the specific population of Appalachian students.

Previous Upward Bound Studies

Since the inception of the UB program in 1965, research has been conducted to assess the effectiveness of the program (Blake, 1998; Laws, 1999). A significant volume of the available research regarding the effectiveness of UB is dated. The culmination of the research conducted over the previous five decades concurs with Blake's (1998) assertion that UB has had a significant, generational impact on society. Positive outcomes have also been found to be linked to how long a student remains in

the UB program with longer participation resulting in greater success (Young & Exum, 1982).

National evaluations have been conducted to determine the effectiveness of UB. The first of these studies commenced in June of 1966 (Hunt & Hardt, 1969). Researchers Hunt and Hardt (1969) were surprised to discover through the study that the majority of UB students at that time (51.4% in 1966 and 50.4% in 1967) were African American and that only 35% of participants self-identified as Caucasian. With this in mind, Hunt and Hardt (1969) focused their study on determining the impact UB has on African American versus Caucasian students. For their research, the authors utilized a ten percent representative sample which resulted in them working with twenty-one UB programs as well as a control group consisting of students with GPAs similar to those of the UB students involved in the study.

In order to obtain a holistic evaluation of the participants that included students' attitudes and motivations in addition to their academic achievements, Hunt and Hardt (1969) designed their own evaluative instrument as well as utilized students' GPAs as measures. The authors found statistically significant increases for both African American and Caucasian UB students regarding their future orientation, internal control, interpersonal flexibility, motivation for college, and self-esteem. These increases were comparable for both groups indicating that UB impacts both African American and Caucasian students similarly. More notably, the first national evaluation of UB demonstrated that the program has a statistically significant impact on participants.

Approximately ten years later, Burkheimer et al. (1976) would conduct another national study regarding the effectiveness of UB programs. Their study comprised of a quasi-experimental design with a cross-sectional approach. They, additionally, collected some retrospective and short-range longitudinal data.

Burkheimer et al. (1976) collected their data via eleven instruments. These instruments ranged from questionnaires, interview questions, and student academic records. One of the questionnaires was completed by 3,710 UB students across fifty-four UB programs. A questionnaire was also sent to the director of each of these fifty-four UB programs as well as up to five staff members from each program which culminated in responses from 369 total UB staff members. Additionally, interviews were also completed via site-visits with fifteen of the UB programs. School academic records served as supplementary data.

The authors found that the retention and graduation levels of UB students were higher than those of the comparison group. The data also showed that UB participants were more likely to enroll in and attend higher education than their peers. In fact, Burkheimer et al. (1976) found that most UB students immediately attend postsecondary education after high school. Another noteworthy finding from their study was that student success was shown to be positively related to the amount of time a student spent in a UB program.

Burkheimer et al. (1976) were transparent regarding the limitations of their study. First, they noted that most of their findings were not significant. Additionally, they identified a lack of internal consistency within their instruments and also noted the potential issues that can arise from stepwise analysis techniques. The researchers also

cautioned that any data regarding UB needs to be consumed with the understanding that UB participants and individual programs differ, potentially, to a large degree.

The results of an additional national evaluation of UB's effectiveness were published in 1999 (Myers & Schirm, 1999). This longitudinal study utilized a representative sample of 67 Upward Bound programs with a treatment group consisting of approximately 1,500 UB participants and a control group of around 1,300 students who were eligible for, but not a participant in, the program. In 1992, 1994, and 1996, study participants completed surveys concerning their academic experiences and expectations and the researchers, additionally, collected participants' school transcripts for additional data.

The outcomes of both groups were analyzed to determine if UB had a significant impact on the treatment group. The results were mixed. UB was found to *not* have an impact on high school graduation rates, parent involvement in education, participation in extracurricular activities, nor have a significant impact on high school credits earned. In contrast, UB students were found to have higher educational expectations, have higher college-going rates, be more likely to receive financial aid, and be more engaged in extracurriculars in college. Notably, UB's impact was especially significant on certain subgroups such as students with low, initial educational expectations, freshmen who had a poor academic performance their freshmen year, and on male students in general. Additional discoveries included the finding that students were more significantly impacted the longer they were in the program. Thus, the authors concluded that targeting low-performing students and working to retain them might be the most impactful strategy that UB programs could employ. Since many of the students in the

treatment group had not attended or completed college yet, Myers and Schirm (1999) noted that the study's findings were limited regarding UB's impact on a student's postsecondary education.

Additional researchers have identified the need for empirical studies related to the effectiveness of UB. McLure and Child (1998) conducted a study comparing UB students with non-UB students by using data from the ACT which included information from the non-academic portions of the test. The authors utilized nine research questions to compare things such as demographic information, educational aspirations, family income, etc. in addition to comparing the students' ACT Composite.

Participants consisted of 2,538 UB students who took the ACT from 1997-1998 and a control group consisting of 997,069 students in the graduating class of 1998. McLure and Child (1998) found that the UB students in the study expected to achieve a higher level of education, estimated their college GPA to be higher, were more confident in the selection of their major, and were more likely to apply for financial aid than their peers. The average ACT Composite score, however, was lower for UB students than non-UB students.

The authors were candid regarding the limitations of their study. McLure and Child (1998) noted that, regarding the participants, there were many more UB students in the lower-income bracket than non-UB students. This is not surprising since acceptance into UB requires that the individual be first-generation and/or low-income. McLure and Child (1998) also noted the drastic difference in the number of non-UB students (997,069) and UB students (2,538) utilized for the study. Additionally, the study's results are questionable since the majority of the UB students were in 11th grade

while the non-program participants were mostly in 12th grade which, obviously, afforded them with an additional year of education potentially contributing to their superior ACT scores. In summary, McLure and Child (1998) noted that UB students were positively impacted by the program especially regarding improving students' self-esteem, increasing their educational expectations, and elevating their knowledge of higher education.

Research has also been conducted to ascertain the efficacy of individual UB programs. McCormick and Williams (1974) conducted a study of the UB program at the University of South Florida. Their work was focused specifically on evaluating the impact that UB's summer, residential component has on program participants.

The authors' sample was comprised of 152 students. Utilizing the measures of the Metropolitan High School Achievement Test, the Tennessee Self-Concept Scale, and Worrell's Level of Aspiration Index, McCormick and Williams (1974) tested the participants three different times between January and August of 1970. The students demonstrated greater gains during the summer component (May-August) than during the academic year (January-May) which confirmed the researchers' hypothesis that the summer component has more of an impact on the selected variables than the activities of the academic year. The authors do state that UB cannot be identified as the factor that improved the students' academic scores on the measures since no control group was utilized. McCormick and Williams (1974) also noted that the study is limited due to the fact that it was conducted with a lone UB program.

Grimard and Maddaus (2004) also conducted a study assessing UB's effectiveness using a single UB program which was located in rural Maine. Their

research focused on identifying the specific impediments that low-income and rural high school students experience to their participation in higher education and how a UB program addresses and supports these students through these challenges. The authors identified the importance of the study by citing the general lack of extant research regarding UB programs.

Grimard and Maddaus (2004) conducted a mixed-methods study with data consisting of surveys, completed by students, as well as interviews conducted with students, guardians of students, and high school counselors. The research questions utilized by the authors were related to the impact of the UB program including its influence on recruitment and retention. The study collected data in three phases. A survey was completed by the UB students who attended the 1999 summer program, surveys were completed by school staff during the fall of 2000, and guardians completed the final phase in fall of 2001.

Through their research, Grimard and Maddaus (2004) found that financial, as well as social challenges, were the biggest obstacles for UB participation and for college attendance that were encountered by low-income and rural, high school students. While actually paying for college is a financial obstacle, the students in the study also noted that many students in the area did not pursue higher education since there were opportunities to earn a notable salary within their communities. Since many of these students resided within the coastal communities of Maine, they possessed the ability to earn a decent living working on lobster boats. This was a more appealing option for many students rather than going into debt to attend college.

The authors also noted that social issues impact students' participation in UB as well as their college-going rates. Being away from home was cited as a significant barrier for almost half of the students who participated in the survey. This barrier may come from the students' personal desire to maintain familial relationships or from the students' families themselves. Indeed, Grimard and Maddaus (2004) found that the social connections characteristic of rural communities was very evident in their study.

Those individuals who participated and persisted in the UB program touted the benefits of the academic and social incentives of the program. Grimard and Maddaus (2004) found that 91% of participants felt the program prepared them for college. Additionally, while familial relationships were greatly valued among the students, many of them desired to meet new people and especially those of different racial and ethnic groups.

Grimard and Maddaus (2004) generally found UB to be effective. Parents/guardians noted that their student was more prepared for college and had developed socially as a result of participating in the program. Additionally, 98% of students indicated on the survey that they found the program to be effective or "somewhat" effective. Grimard and Maddaus (2004) are forthright that their study was based on only a single UB program which is one that works with students and communities representing the unique characteristics of rural Maine.

Laws (1999) utilized a control group of non-UB students to conduct a study determining the impact that UB has on college freshmen's GPAs, dropout rates, and math and English grades. The findings are limited due to the fact that the author studied only one UB program and only those students from the program who went on to attend

the institution that hosted the grant. Thus, only twenty UB students and a control group of twenty non-UB students was utilized for the study.

The researcher found no significant difference in the mean GPAs nor the dropout rates of UB and non-UB students. Regarding math and English grades, UB students' grades were higher in English and lower in math than those in the control group. Due to the limited number of participants, Laws (1999) was honest that his findings were reflective of only that individual UB program and could not be considered indicative of UB nationwide.

III. Methodology

Introduction

Participation in higher education typically affords low-income students with a pathway out of poverty. Individuals within this population participate in higher education at a considerably lower rate than their middle and upper-class peers (Jean, 2011; Castleman et al., 2012). In order to address this discrepancy, abundant financial resources are invested into college access programs for secondary school students, such as the federally funded UB program, which aim to improve the college-going rates of low-income and first-generation students.

Plentiful research has been conducted, over UB's many decades of existence, demonstrating the program's wide-ranging success in assisting low-income and first-generation students in successfully completing high school and being accepted into and attending higher education. Nonetheless, there was an insignificant volume of research comparing UB programs with one another with most related research designed to gauge the effectiveness of individual programs or of the program in general. This created a gap in the literature that this study aimed to address. The purpose of this study was to compare the effectiveness of the different summer program models utilized by UB programs in the Central Appalachian region by using the numerical data produced by the APR. The results produced by this study are of value due to the fact that it was discovered that some summer program models were more successful in meeting program objectives than others. Thus, further research can be conducted regarding what precisely makes them more effective, and new UB grants can elect to adopt this model due to its demonstrated primacy. In addition to more effectively investing taxpayer

dollars, improving UB programs would also better serve the disadvantaged population of UB participants.

This chapter will elaborate on the study's methodology by discussing the research question and research methodology. It will also present the specifics regarding the study's participants, the instrument used to collect data, and how that data was collected, analyzed, and managed. This section will also address issues regarding validity, reliability, and ethics as well as note the limitations and delimitations of the study.

Research Questions

The following research question guided this quantitative study:

RQ1: There is a significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

$H1_0$: There is no significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

The data collected for this study directly addressed the research question. UB programs experience extensive oversight from ED and must follow very specific guidelines, provide certain services, and report their numerical performance on six objectives yearly via an Annual Performance Report which is ED's evaluation tool of UB programs (U.S. Department of Education, 2020). These six objectives are related to program participants' GPAs, proficiency in math and language arts, rigor of secondary courses taken, high school graduation rate, college enrollment, and completion of a

bachelor's degree within six years of starting college (U.S. Department of Education, 2016). The objectives for all UB programs are as follows:

Objective (1): Target percentage of participants served during the project year will have a cumulative GPA of 2.5 or better on a four-point scale at the end of the school year.

Objective (2): Target percentage of UB seniors served during the project year will have achieved at the proficient level on state assessments in reading/language arts and math.

Objective (3): Target percentage of participants served during the project year will continue in school for the next academic year, at the next grade level, or will have graduated from secondary school with a regular secondary school diploma.

Objective (4): Target percentage of all current and prior year UB participants, who graduated from high school during the school year with a regular secondary school diploma, will complete a rigorous secondary school program of study.

Objective (5): Target percentage of all current and prior UB participants who graduated from high school during the school year with a secondary diploma will enroll in a program of postsecondary education by the fall term immediately following high school from an institution of higher education of acceptance by deferred enrollment until the next academic semester (e.g., spring semester).

Objective (6): Target percentage of participants who enrolled in a program of postsecondary education, by the fall term immediately following high school graduation or by the next academic term (e.g., spring term) as a result of acceptance by deferred enrollment, will attain either an associate or bachelor's degree within six years following graduation from high school.

In order to address the research question, the researcher collected the baseline data, target percentage, and the achieved percentage for these objectives from participating UB programs. These programs consisted of those hosted at colleges, universities, or agencies located within the Central Appalachian region. This APR data served as a way to numerically compare the effectiveness of participating UB programs.

Research Methodology

This study utilized a quantitative research methodology. An individual UB program may serve hundreds of participants. Thus, interviewing sufficient participants from several programs in order to compare and contrast the effectiveness of individual programs was not feasible. The research question was best and most efficiently answered and addressed through a quantitative study.

Additionally, further justifying the selection of a quantitative research methodology was the fact that all UB programs already complete the same, standardized report annually. This report produces numerical data regarding the program's effectiveness and its existence also negates the need to produce a new or unique instrument for the study. This data can straightforwardly be analyzed and equated with the data of another program(s). Thus, the baseline data, target percentage, and the achieved percentage of participating programs will be collected for each of the following objectives:

Objective (1): Target percentage of participants served during the project year will have a cumulative GPA of 2.5 or better on a four-point scale at the end of the school year.

Objective (2): Target percentage of UB seniors served during the project year will have achieved at the proficient level on state assessments in reading/language arts and math.

Objective (3): Target percentage of participants served during the project year will continue in school for the next academic year, at the next grade level, or will have graduated from secondary school with a regular secondary school diploma.

Objective (4): Target percentage of all current and prior year UB participants, who graduated from high school during the school year with a regular secondary school diploma, will complete a rigorous secondary school program of study.

Objective (5): Target percentage of all current and prior UB participants who graduated from high school during the school year with a secondary diploma will enroll in a program of postsecondary education by the fall term immediately following high school from an institution of higher education of acceptance by deferred enrollment until the next academic semester (e.g., spring semester).

Objective (6): Target percentage of participants who enrolled in a program of postsecondary education, by the fall term immediately following high school graduation or by the next academic term (e.g., spring term) as a result of acceptance by deferred enrollment, will attain either an associate or bachelor's degree within six years following graduation from high school.

Population and Sample Selection

The population for the study consisted of UB programs hosted at colleges, universities, or agencies located within the Central Appalachian region that voluntarily participated in the research. The research population specifically consisted of UB programs hosted at colleges, universities, or agencies *located* within the Central Appalachian region, but the study did *not* take into consideration the individual high schools served by each UB program. Thus, some of the UB participant data utilized in

the study may have been generated from students who do not actually live within the boundaries of the Central Appalachian region. Correspondingly, UB students who live in Central Appalachia were not be included in the study if their program's host institution is not, itself, located within Central Appalachia.

Instrumentation

The instrument used to collect data for this study was the APR which is a standardized report that is completed by every UB program. The APR produces numerical data regarding an individual program's effectiveness on six objectives. Programs are required to submit this information to ED annually (U.S. Department of Education, 2020c). APR results served as the data for this study.

While writing for a UB grant, the writers must, through utilization of census data, etc. that is relevant to the area that the grant will serve, determine a baseline for each of the six objectives listed on the APR. For example, the grant writers may find that 11% of students in the target area have a cumulative GPA of 2.5 or better on a four-point scale at the end of the school year. The grant writers will then need to determine what the target percentage will be for the potential UB project, and this will need to be denoted on the application.

The target percentage is what ED will expect the program to attain each year if they are funded and the Department expects that grantees will set target percentages that are ambitious yet attainable (typically 10-15% higher than the baseline). For example, the writers may set the target percentage at 25% if the baseline data for a particular objective is 11%. While baseline data was collected for this study, participating

programs' target percentages were not factored into this study since they are irrelevant in addressing the research question.

Data Collection

In order to collect data for this study, the researcher emailed the director of each UB program hosted at a college, university, or agency located within Central Appalachia and requested the program's baseline data for the six objectives as well as their APR data for grant years two through four. The data for these three years was collected due to the fact that ED does not consider years one and five of the grant cycle when assessing a program's effectiveness.

In addition to this data, each director identified the type of summer program model (residential, nonresidential, or mixed) their program utilizes as well. The directors were able to submit this information via a Google Form, the link for which was included in the email. The UB programs that completed the form were the participants utilized for the study. The researcher did send out a second, reminder email since an insufficient number of programs responded to the initial request. This was to ensure sufficient data to conduct a robust, statistical analysis.

Data Analysis

The following research question guided this quantitative study:

RQ1: There is a significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

$H1_0$: There is no significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

Based on extant literature regarding the effectiveness of UB, the expectation was that the study would reveal that the vast majority of UB programs located in Central Appalachia met all or most of their APR objectives for years two, three, and four of the 2017-2022 grant cycle. It should be noted, however, that the COVID-19 pandemic likely impacted UB programs' ability to meet their objectives. Since all UB programs were faced with this same challenge, it had no impact on this study.

The research question for this study was related to whether there is significant difference regarding the effectiveness of the different summer program models utilized by UB programs in the Central Appalachian region. To test this, the APR data of participating UB programs was analyzed using an ANOVA test. An ANOVA test was conducted for each of the individual, six objectives. If it was found that an ANOVA produced a p-value that was less than or equal to the significance level, a post-hoc test was conducted, and the null hypothesis was rejected. However, if the ANOVA did *not* produce a p-value that was less than or equal to the significance level, this indicated that there was no significant difference among the effectiveness of the different summer program models utilized by UB programs in the Central Appalachian region.

Validity

The extant instrument employed for the study, the APR, is straightforward. Utilizing census data, etc. that is relevant to the area that the grant will serve, UB grant writers determine baseline data for each of the six objectives identified by the

Department of Education. In the grant application, the writers will select a target percentage (above the baseline) for each of these objectives and, via the APR results, will show the program's success regarding meeting each of these objectives.

One of the primary goals of UB programs is to show that the interventions implemented by the program produce results. Thus, the APR reveals whether the program produced results above what would have been achieved without the program (the baseline data). Therefore, the instrument clearly denotes the effectiveness of a singular UB program and how effective that program is above the baseline.

Reliability

Due to the nature of the instrument and the specifics of this research, another researcher could replicate the study and produce identical results by using the same UB programs for participants and by collecting the same APR data. This indicates that the measuring procedure for the study is replicable. Additionally, since every UB program completes the APR, the instrument could be utilized for other, similar studies.

Data Management Section

The data utilized for this study was the baseline data as well as the APR data for grant years two through four that was collected from participating UB programs located in Central Appalachia. This information was collected via a Google Form and each responding UB program was assigned a number such as UB Grant #1, etc. The data was downloaded from Google Forms into an Excel document and this spreadsheet included each program's identifier (UB Grant #1, etc.) as well as their grant's baseline data and their achieved percentage regarding the six objectives from years two through four of the grant cycle. Aside from the baseline data, this resulted in eighteen numerical data

points for each participating program. It is noteworthy that, since APR information is public record and individual colleges and universities are not identified on the spreadsheet, the security of and the need to destroy this data is negligible.

Data Analysis Procedures

The following research question guided this quantitative study:

RQ1: There is a significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

$H1_0$: There is no significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

APR data from 50+ participating UB grant years was collected and compared in order to address the research question. The data utilized was only the APR data for years two, three, and four of the grant cycle since these are the only years that ED considers when evaluating an individual program's performance. Each participating program shared the baseline data specified within its grant application as well as its achieved percentages for the six APR objectives during years two, three, and four. This produced eighteen numerical data points for each individual UB program. By collecting each program's baseline data as well as its objectives and scores for years two, three, and four, the researcher was able to determine if individual UB programs were successful in meeting their objectives. Additionally, they were able to compare this data among all participating programs to determine if a different summer program model

utilized by UB programs in the Central Appalachian region was more effective in meeting their objectives than other models.

In order to collect data for this study, the researcher sent an email to the director of each relevant UB program requesting the desired information. Program directors were able to submit this data via a Google Form, the link for which was included in the email. The collected data was downloaded from Google Forms into an Excel document. This included each grant's identifier (Grant #1, etc.) as well as their grant's baseline data and their attained percentage for each of the six objectives for the three specified years of the grant cycle. Aside from the baseline data, this produced eighteen numerical data points for each participating grant.

Initial data consisted of eighteen scores for each participating program, but it was inappropriate to simply compare these scores directly. For example, if one UB program produced 23% for APR objective four (Percentage of all current and prior year UB participants, who graduated from high school during the school year with a regular secondary school diploma, will complete a rigorous secondary school program of study) and another program achieved 34%, the program attaining 34% for this objective was not necessarily more successful than the other program since the baseline data for each program is likely different.

In order to more accurately capture a program's success, the baseline number for each objective was subtracted from each achieved percentage for that objective. If a program's baseline number for an objective was 23% and, for years 2-4 of the grant cycle the program achieves 34%, 41%, and 52% on that objective, these scores were converted to 11%, 18%, and 29% for this study. Rather than simply identifying the

achieved percentages for the objective for the identified years, the adjusted scores add context by representing the percentage that the program achieved above the *baseline*. The three adjusted scores served as the program's scores for that particular objective and was the data that was analyzed.

These final scores for each participating program were analyzed using an ANOVA test. If it was found that an ANOVA produced a p-value that was less than or equal to the significance level, a post-hoc test was conducted, and the null hypothesis was rejected. However, if the ANOVA did *not* produce a p-value that was less than or equal to the significance level, this indicated that there was no significant difference among the effectiveness of the different summer program models utilized by UB programs in the Central Appalachian region.

The same procedure occurred for each of the five remaining objectives. Each of the six objectives were analyzed individually because a UB program may only produce notable scores on one of the objectives. The purpose of this study was to address the gap in knowledge regarding whether some summer program models are more effective in meeting programmatic objectives than others. In several instances, it was discovered that one model was more effective in increasing scores of one particular objective but the model did not have significantly greater success regarding another objective. Further research can be conducted into what precisely made a model more effective concerning a particular objective.

Ethical Considerations

This study presented minor to no ethical concerns. All data is presented anonymously and, thus, the APR data of UB programs was analyzed and compared

without identifying specific programs. Additionally, since a UB program's baseline data and APR results are public record, the security of and the need to destroy this data is negligible.

While the collected information is public record, it might have been an ethical error to identify specific programs that failed to meet their objectives. Additionally, it might have been problematic to identify programs with meritorious results since it might potentially recognize these programs as being "better" than the rest utilized in the study. The anonymity of this study negated all of these concerns.

Limitations and Delimitations

There were several limitations within this study that should be recognized and noted. First, data was only collected from UB programs that voluntarily participated and willingly provided this data. Programs whose APR data is subpar, despite the anonymity of the study, may have chosen not to participate in the study due to not desiring to share these results. Thus, by only utilizing data from programs that choose to participate, it is possible that the study's results are not indicative of the Central Appalachian region as a whole.

Additionally, while the APR served as an excellent, standardized instrument, its use is not without limitations. ED only considers years two through four of the APR results when gauging program effectiveness. As a result, the actual amount of data utilized for the study was somewhat limited. Since there are unique challenges related to both years one and five of a UB grant cycle that can greatly impact the APR data for these two years, this was unavoidable.

Summary

Abundant financial resources are invested into college access programs, such as the UB program. The purpose of this study was to compare the effectiveness of the different summer program models utilized by UB programs in the Central Appalachian region by using the numerical data produced by the APR. This determination is valuable since the financial cost as well as the potential impact of these programs is immense. The following research question guided this quantitative study:

RQ1: There is a significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

$H1_0$: There is no significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

The data collected for this study consisted of individual UB program's numerical performance on six objectives that they must submit yearly to ED via the APR. The APR served as the evaluation tool for this study. The six objectives that were observed were related to participants' GPAs, proficiency in math and language arts, rigor of secondary courses taken, high school graduation rate, college enrollment, and completion of a bachelor's degree within six years of starting college (U.S. Department of Education, 2016).

In order to collect data for this study, the researcher sent an email to the director of each UB program located in Central Appalachia and requested the baseline data for their grant as well as their APR data for grant years two through four. They were able to

submit this information anonymously via a Google Form. The data, consisting of eighteen numerical data points, was downloaded from Google Forms into an Excel document. Since this information is public record and individual colleges and universities are not identified, the security of and the need to destroy this data is negligible.

Data collection produced, in addition to baseline data, eighteen scores for each participating UB grant. To arrive at these scores, the baseline number for an objective was subtracted from each achieved score on that objective. This served as that particular grant's score for that specific year and was the data utilized in the study.

The scores for each participating program for each relevant year for each APR objective was analyzed using an ANOVA test. An ANOVA was conducted for each of the individual, six objectives. If it was found that an ANOVA produced a p-value that was less than or equal to the significance level, a post-hoc test was conducted, and the null hypothesis was rejected. However, if the ANOVA did *not* produce a p-value that was less than or equal to the significance level, this indicated that there was no significant difference among the effectiveness of the different summer program models utilized by UB programs in the Central Appalachian region.

This research identified whether or not the different summer program models utilized by UB programs in the Central Appalachian region demonstrate greater success in meeting their APR objectives than other models. The study presented minor to no ethical concerns since all data will be presented anonymously and is public record. It should be noted that the results are limited due to the fact that data was only collected from programs that voluntarily provided their data as well as the fact that, due to

utilizing the data from only years two through four of the grant cycle, the actual amount of data utilized for the study was somewhat limited.

IV. Results

The purpose of this study was to compare the effectiveness of UB programs located within the Central Appalachian region to determine if there was a statistically significant difference between the three different summer program models. The three models include residential, non-residential, and mixed. The following research question guided this study:

RQ1: There is a significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

$H1_0$: There is no significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

The feasibility of comparing UB programs is realized due to the fact that all UB programs complete the same, standardized annual report. To complete this study, APR data from the 2017-2022 grant cycle was collected from UB programs located within Central Appalachia. The APR is a standardized instrument that produces numerical data which provides justification for employing a quantitative research methodology for this study. A one-way ANOVA analysis was conducted (utilizing SPSS) for each of the six UB APR objectives by applying the collected data. Post hoc tests were conducted when appropriate. Through this process, the effectiveness of UB programs and their corresponding summer program models was compared.

Participants

In order to collect data for this study, the researcher sent an email to the director of each UB program located in Central Appalachia and requested the baseline data for their grant(s), their APR data (actual, achieved percentages) for grant years two through four, as well as the type of summer program (residential, nonresidential, or mixed) that they employ. Participants were able to submit this data via a Google Form, the link for which was included in the email. The email was sent to 31 UB programs which represent 55 grants located across six states. The institutions/agencies contacted included: Appalachian State University, Berea College, Concord University, Davis & Elkins College/Elkins, Douglas-Cherokee Economic Authority, Inc., East Tennessee State University, East Tennessee State University/Kingsport, Eastern Kentucky University, Hazard Community College, Marshall University, Morehead State University, Patrick Henry Community College, Salem International University, Shawnee State University, Shepherd University, Somerset Community College, Southeast Kentucky Community & Technical, Southwest Virginia Community College, Southwestern Community College, Tennessee Wesleyan University, Tusculum University, University of Pikeville, University of Tennessee/Chattanooga, University of Tennessee/Knoxville, Virginia Highlands Community College, Virginia Polytechnic Institute & State, Washington State Community College, West Virginia State University, West Virginia University Institute of Technology, West Virginia University, and Wytheville Community College.

Nineteen UB grants responded to the email. Ten of these grants employ a residential summer program model, five employ a mixed model, and four programs

have a non-residential summer program. These responses provided 57 data points for each of the six objectives (except for objective six which only has 51 since the objective was not applicable to two grants due to them being new grants for the 2017-2022 grant cycle). Table 4.1 provides the summer program model for each grant as well as their scores above the baseline for each objective.

Table 4.1
Initial Data

Grant	Model	Object. 1	Object. 2	Object. 3	Object. 4	Object. 5	Object. 6
GRANT #1 (18-19)	Res.	18	20	10	30	0	0
GRANT #1 (19-20)	Res.	19	20	10	24	0	0
GRANT #1 (20-21)	Res.	20	20	10	35	0	0
GRANT #2 (18-19)	Res.	20	40	23	23	46	18
GRANT #2 (19-20)	Res.	21	42	23	23	28	9
GRANT #2 (20-21)	Res.	11	22	19	23	17	14
GRANT #3 (18-19)	Mixed	24.27	24	24	34.19	68.95	56.67
GRANT #3 (19-20)	Mixed	32.86	24	24	3.45	42.55	0
GRANT #3 (20-21)	Mixed	6.67	24	24	33	58	25.71
GRANT #4 (18-19)	Res.	22.42	19.7	15.1	29.7	15	29.8
GRANT #4 (19-20)	Res.	18.42	26.7	12.1	29.7	23	8.8
GRANT #4 (20-21)	Res.	17.42	16.7	15.1	21.7	21	52.8
GRANT #5 (18-19)	Mixed	26.34	24	12.3	44.2	45	N/A
GRANT #5 (19-20)	Mixed	31.34	30	12.3	47.2	36	N/A
GRANT #5 (20-21)	Mixed	19.34	27	10.3	36.2	24	N/A
GRANT #6 (18-19)	Non-Res.	22	31	21	67	61	54

GRANT #6 (19-20)	Non-Res.	22	31	21	72.84	68	55
GRANT #6 (20-21)	Non-Res.	22	31	21	72	74	54
GRANT #7 (18-19)	Non-Res.	18	37	12	81	72	18
GRANT #7 (19-20)	Non-Res.	18	37	12	72	64	57
GRANT #7 (20-21)	Non-Res.	16	37	12	89	82	60
GRANT #8 (18-19)	Res.	18	47.6	26.3	62.2	13.9	38.68
GRANT #8 (19-20)	Res.	25	18.06	19.9	58.2	29.9	29.2
GRANT #8 (20-21)	Res.	4.8	15.46	8.7	66.02	20.57	40.2
GRANT #9 (18-19)	Res.	21.42	16	14.1	29.7	13	27.8
GRANT #9 (19-20)	Res.	15.42	0	10.1	29.7	7	14.8
GRANT #9 (20-21)	Res.	21.42	16	14.1	29.7	13	27.8
GRANT #10 (18-19)	Mixed	38.16	45.71	86.7	35.96	40.76	47.91
GRANT #10 (19-20)	Mixed	30.6	51.9	86.7	24.3	35.1	42.4
GRANT #10 (20-21)	Mixed	27.6	60.9	86.7	36.3	38.1	56.4
GRANT #11 (18-19)	Res.	13.02	25	11.3	26.6	10	41.6
GRANT #11 (19-20)	Res.	9.02	0	7.3	26.6	0	28.6
GRANT #11 (20-21)	Res.	9.02	0	11.3	26.6	5	30.6
GRANT #12 (18-19)	Non-Res.	24	50	22	31	21	0
GRANT #12 (19-20)	Non-Res.	23	50	16	36	23	12
GRANT #12 (20-21)	Non-Res.	12	50	10	37	13	2
GRANT #13 (18-19)	Mixed	17.4	29	8.7	29.6	49	N/A
GRANT #13 (19-20)	Mixed	32.4	29	10.7	35.6	33	N/A
GRANT #13 (20-21)	Mixed	20.4	3	10.7	24.6	12	N/A

GRANT #14 (18-19)	Res.	36	62	19	28	28	22
GRANT #14 (19-20)	Res.	36	39	19	28	33	55
GRANT #14 (20-21)	Res.	31	22	19	28	29	50
GRANT #15 (18-19)	Non-Res.	18	40	16	86	72	31
GRANT #15 (19-20)	Non-Res.	10	40	8	84	74	25
GRANT #15 (20-21)	Non-Res.	18	40	16	87	86	34
GRANT #16 (18-19)	Mixed	29.4	28.5	10	11.7	27.5	34.9
GRANT #16 (19-20)	Mixed	35.4	32.5	9	22.7	28.5	28.9
GRANT #16 (20-21)	Mixed	11.4	16.5	6	14.7	37.5	17.9
GRANT #17 (18-19)	Res.	38	60	16	27	20	28
GRANT #17 (19-20)	Res.	37	4	16	21	19	32
GRANT #17 (20-21)	Res.	38	3	16	27	20	17
GRANT #18 (18-19)	Res.	13.08	17	10.7	29.1	8	38.7
GRANT #18 (19-20)	Res.	14.08	0	6.7	29.1	0	26.7
GRANT #18 (20-21)	Res.	15.08	0	10.7	20.1	22	49.7
GRANT #19 (18-19)	Res.	25	53	13	13	40	14
GRANT #19 (19-20)	Res.	25	57	13	13	26	27
GRANT #19 (20-21)	Res.	21	42	8	13	41	12

Initial Findings

The grants had varying results regarding meeting their identified objectives. For Objective One, all grant scores for all three years were above their identified baseline revealing that students participating in UB experienced more success regarding this objective than their peers. While still above the baseline, 10 of the 57 did not meet

program objectives. Seven of these 10 incidences occurred during the 20-21 academic year where the COVID-19 pandemic undoubtedly impacted most facets of education.

For Objective Two, 5 of 57 grant scores over the three years were below their identified baseline which indicates that these UB students experienced less success regarding this objective than their peers. Additionally, a total of 11 of the 57 did not meet program objectives. Seven of these 11 incidences occurred during the 20-21 academic year where the COVID-19 pandemic undoubtedly impacted most facets of education.

For Objective Three, all grant scores for all three years were above their identified baseline revealing that students participating in UB experienced more success regarding this objective than their peers. While still above the baseline, 6 of the 57 did not meet program objectives. Three of these 6 incidences occurred during the 20-21 academic year where the COVID-19 pandemic undoubtedly impacted most facets of education.

For Objective Four, all grant scores for all three years were above their identified baseline revealing that students participating in UB experienced more success regarding this objective than their peers. While still above the baseline, 6 of the 57 did not meet program objectives. Three of these 6 incidences occurred during the 20-21 academic year where the COVID-19 pandemic undoubtedly impacted most facets of education.

For Objective Five, 5 of 57 grant scores over the three years were below their identified baseline which indicates that these UB students experienced less success regarding this objective than their peers. Additionally, a total of 15 of the 57 did not

meet program objectives. Six of these 15 incidences occurred during the 20-21 academic year where the COVID-19 pandemic undoubtedly impacted most facets of education.

For Objective Six, 5 of 51 grant scores over the three years were below their identified baseline which indicates that these UB students experienced less success regarding this objective than their peers. Additionally, a total of 10 of the 51 did not meet program objectives. Four of these 10 incidences occurred during the 20-21 academic year where the COVID-19 pandemic undoubtedly impacted most facets of education. One respondent, notably, indicated that their program achieved a score of 0% for one year for this objective. This is likely an error and one that negatively impacted the number of programs who failed to meet the baseline and objective.

ANOVA Analysis

The scores for each applicable year for each grant was run in a separate ANOVA (utilizing SPSS) for each objective. Unique findings for each individual objective are presented. Statistical significance was assessed at the 5% significance level (p-value < 0.05). Post hoc tests were conducted when appropriate.

Objective One

Using the collected data, a one-way between subjects ANOVA was conducted to determine if there is a variance in the APR scores for Objective One (Target percentage of participants served during the project year will have a cumulative GPA of 2.5 or better on a four-point scale at the end of the school year) between UB programs with a Residential, Non-Residential, or Mixed summer program. This analysis was conducted

to find if grants with one type of summer program produce greater APR scores over the baseline compared to the others. Descriptive statistics are presented in Table 4.2.

Table 4.2
Descriptives for Objective One

					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Mixed	15	25.5720	8.96376	2.31443	20.6080	30.5360	6.67	38.16
Non-Residential	12	18.5833	4.35803	1.25805	15.8144	21.3523	10.00	24.00
Residential	30	21.1207	9.03511	1.64958	17.7469	24.4944	4.80	38.00
Total	57	21.7579	8.50682	1.12676	19.5007	24.0151	4.80	38.16

Table 4.3 shows that Levene's test was not significant, so the assumption of homogeneity of variance was met for this sample.

Table 4.3
Tests of Homogeneity of Variances for Objective One

		Levene Statistic	df1	df2	Sig.
APRData	Based on Mean	2.450	2	54	.096
	Based on Median	2.079	2	54	.135
	Based on Median and with adjusted df	2.079	2	47.429	.136
	Based on trimmed mean	2.314	2	54	.109

ANOVA results, illustrated in Table 4.4, indicate that there is no significant effect of summer program type on objective one [$F(2,54) = 2.563$, $p = .086$].

Table 4.4
ANOVA for Objective One

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	351.327	2	175.663	2.563	.086
Within Groups	3701.165	54	68.540		
Total	4052.492	56			

Objective Two

Using the collected data, a one-way between subjects ANOVA was conducted to determine if there is a variance in the APR scores for Objective Two (Target percentage of UB seniors served during the project year will have achieved at the proficient level on state assessments in reading/language arts and math) between UB programs with a Residential, Non-Residential, or Mixed summer program. This analysis was conducted to find if grants with one type of summer program produce greater APR scores over the baseline compared to the others. Descriptive statistics are presented in Table 4.5.

Table 4.5
Descriptives for Objective Two
APRData

					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Mixed	15	30.0007	14.03051	3.62266	22.2308	37.7705	3.00	60.90
Non-Residential	12	39.5000	7.17952	2.07255	34.9384	44.0616	31.00	50.00
Residential	30	24.1407	19.02598	3.47365	17.0362	31.2451	.00	62.00
Total	57	28.9163	16.83249	2.22952	24.4501	33.3826	.00	62.00

Table 4.6 shows that Levene's test produced a p-value (.012) less than .05. Thus, the assumption of homogeneity of variance has been violated. In response, a Welch test was conducted.

Table 4.6
Tests of Homogeneity of Variances for Objective Two

		Levene Statistic	df1	df2	Sig.
APRData	Based on Mean	4.805	2	54	.012
	Based on Median	3.158	2	54	.050
	Based on Median and with adjusted df	3.158	2	44.454	.052

	Based on trimmed mean	4.431	2	54	.017

The Welch test, illustrated in Table 4.7, indicates that there is a significant effect of summer program type on objective two [F(2, 32.217) = 7.962, p = .002] since significance is indicated when the test produces a significance value below .05. Due to this, we can reject the null hypothesis that there is no significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

Table 4.7

Robust Tests of Equality of Means for Objective Two

APRData

	Statistic[a]	df1	df2	Sig.
Welch	7.962	2	32.217	.002

a. Asymptotically F distributed.

Due to the statistically significant results, a Games-Howell post hoc test, illustrated in Table 4.8, was conducted. The significance level of .001 between Non-Residential and Residential on the post hoc test reveals a statistically significant difference between the performance of Non-Residential and Residential programs. With a mean of 39.5, Non-Residential programs are statistically more significantly effective than Residential programs (mean of 24.1407) regarding this objective.

Table 4.8

Multiple Comparisons for Objective Two

Games-Howell

(I) SummerProgram	(J) SummerProgram	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound

Mixed	Non-Residential	-9.49933	4.17362	.081	-19.9939	.9952
	Residential	5.86000	5.01896	.480	-6.3988	18.1188
Non-Residential	Mixed	9.49933	4.17362	.081	-.9952	19.9939
	Residential	15.35933*	4.04496	.001	5.5139	25.2047
Residential	Mixed	-5.86000	5.01896	.480	-18.1188	6.3988
	Non-Residential	-15.35933*	4.04496	.001	-25.2047	-5.5139

*. The mean difference is significant at the 0.05 level.

Objective Three

Using the collected data, a one-way between subjects ANOVA was conducted to determine if there is a variance in the APR scores for Objective Three (Target percentage of participants served during the project year will continue in school for the next academic year, at the next grade level, or will have graduated from secondary school with a regular secondary school diploma) between UB programs with a Residential, Non-Residential, or Mixed summer program. This analysis was conducted to find if grants with one type of summer program produce greater APR scores over the baseline compared to the others. Descriptive statistics are presented in Table 4.9.

Table 4.9

Descriptives for Objective Three

APRData

					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Mixed	15	28.1400	30.85810	7.96753	11.0514	45.2286	6.00	86.70
Non-Residential	12	15.5833	4.83281	1.39511	12.5127	18.6540	8.00	22.00
Residential	30	14.2500	5.01073	.91483	12.3790	16.1210	6.70	26.30
Total	57	18.1860	17.08614	2.26311	13.6524	22.7195	6.00	86.70

Table 4.10 shows that Levene's test produced a p-value (<.001) less than .05. Thus, the assumption of homogeneity of variance has been violated. In response, a Welch test was conducted.

Table 4.10
Tests of Homogeneity of Variances for Objective Three

		Levene Statistic	df1	df2	Sig.
APRData	Based on Mean	20.755	2	54	<.001
	Based on Median	5.190	2	54	.009
	Based on Median and with adjusted df	5.190	2	14.769	.020
	Based on trimmed mean	15.660	2	54	<.001

The Welch test, illustrated in Table 4.11, indicates that there is no significant effect of summer program type on objective three [F(2, 22.563) = 1.689, p = .207].

Table 4.11
Robust Tests of Equality of Means for Objective Three

APRData

	Statistic[a]	df1	df2	Sig.
Welch	1.689	2	22.563	.207

a. Asymptotically F distributed.

Objective Four

Using the collected data, a one-way between subjects ANOVA was conducted to determine if there is a variance in the APR scores for Objective Four (Target percentage of all current and prior year UB participants, who graduated from high school during the school year with a regular secondary school diploma, will complete a rigorous secondary school program of study) between UB programs with a Residential, Non-Residential, or Mixed summer program. This analysis was conducted to find if grants

with one type of summer program produce greater APR scores over the baseline compared to the others. Descriptive statistics are presented in Table 4.12.

Table 4.12

Descriptives for Objective Four

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Mixed	15	28.9133	12.07216	3.11702	22.2280	35.5987	3.45	47.20
Non-Residential	12	67.9033	21.23743	6.13072	54.4097	81.3970	31.00	89.00
Residential	30	29.0240	12.44380	2.27192	24.3774	33.6706	13.00	66.02
Total	57	37.1800	21.48088	2.84521	31.4804	42.8796	3.45	89.00

Table 4.13 shows that Levene's test produced a p-value (.023) less than .05. Thus, the assumption of homogeneity of variance has been violated. In response, a Welch test was conducted.

Table 4.13

Tests of Homogeneity of Variances for Objective Four

		Levene Statistic	df1	df2	Sig.
APRData	Based on Mean	4.039	2	54	.023
	Based on Median	2.482	2	54	.093
	Based on Median and with adjusted df	2.482	2	45.773	.095
	Based on trimmed mean	3.756	2	54	.030

The Welch test results, illustrated in Table 4.14, indicate that there is a significant effect of summer program type on objective four [F(2, 23.132) = 17.973, p = <.001] since significance is indicated when the test produces a significance value below .05. Due to this, we can reject the null hypothesis that there is no significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

Table 4.14

Robust Tests of Equality of Means for Objective Four

APRData

	Statistic[a]	df1	df2	Sig.
Welch	17.973	2	23.132	<.001

a. Asymptotically F distributed.

Due to the statistically significant results, a Games-Howell post hoc test, illustrated in Table 4.15, was conducted. The significance level of <.001 between Non-Residential and Residential as well as between Non-Residential and Mixed on the post hoc test reveals a statistically significant difference between the performance of Non-Residential vs. Residential as well as between Non-Residential vs. Mixed. The means of Residential (29.024) and Mixed (28.9133) programs are statistically significantly below that of Non-Residential programs (mean of 67.9033) regarding this objective.

Table 4.15

Multiple Comparisons for Objective Four

Games-Howell

(I) SummerProgram	(J) SummerProgram	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval

					Lower Bound	Upper Bound
Mixed	Non-Residential	-38.99000*	6.87761	<.001	-56.6779	-21.3021
	Residential	-.11067	3.85712	1.000	-9.6383	9.4170
Non-Residential	Mixed	38.99000*	6.87761	<.001	21.3021	56.6779
	Residential	38.87933*	6.53814	<.001	21.7848	55.9738
Residential	Mixed	.11067	3.85712	1.000	-9.4170	9.6383
	Non-Residential	-38.87933*	6.53814	<.001	-55.9738	-21.7848

*. The mean difference is significant at the 0.05 level.

Objective Five

Using the collected data, a one-way between subjects ANOVA was conducted to determine if there is a variance in the APR scores for Objective Five (Target percentage of all current and prior UB participants who graduated from high school during the school year with a secondary diploma will enroll in a program of postsecondary education by the fall term immediately following high school from an institution of higher education of acceptance by deferred enrollment until the next academic semester) between UB programs with a Residential, Non-Residential, or Mixed summer program. This analysis was conducted to find if grants with one type of summer program produce greater APR scores over the baseline compared to the others. Descriptive statistics are presented in Table 4.16.

Table 4.16

Descriptives for Objective Five

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum

					Lower Bound	Upper Bound		
Mixed	15	38.3973	13.79447	3.56172	30.7582	46.0365	12.00	68.95
Non-Residential	12	59.1667	25.24726	7.28826	43.1253	75.2080	13.00	86.00
Residential	30	18.2790	12.81525	2.33973	13.4937	23.0643	.00	46.00
Total	57	32.1812	22.97308	3.04286	26.0856	38.2768	.00	86.00

Table 4.17 shows that Levene's test produced a p-value (.009) less than .05. Thus, the assumption of homogeneity of variance has been violated. In response, a Welch test was conducted.

Table 4.17

Tests of Homogeneity of Variances for Objective Five

		Levene Statistic	df1	df2	Sig.
APRData	Based on Mean	5.099	2	54	.009
	Based on Median	1.852	2	54	.167
	Based on Median and with adjusted df	1.852	2	26.084	.177
	Based on trimmed mean	4.329	2	54	.018

The Welch test, illustrated in Table 4.18, indicates that there is a significant effect of summer program type on objective four [F(2, 22.186) = 21.156, p = <.001] since significance is indicated when the test produces a significance value below .05. Due to this, we can reject the null hypothesis that there is no significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

Table 4.18

Robust Tests of Equality of Means for Objective Five

APRData

	Statistic[a]	df1	df2	Sig.
Welch	21.156	2	22.186	<.001

a. Asymptotically F distributed.

Due to the statistically significant results, a Games-Howell post hoc test, illustrated in Table 4.19, was conducted. The significance level of <.001 between Non-Residential and Residential as well as between Mixed and Residential on the post hoc test reveals a statistically significant difference between the performance of Non-Residential vs. Residential as well as between Mixed vs. Residential. Based on the means, the APR scores of Non-Residential (59.1667) are statistically greater than Mixed (38.3973) which are statistically greater than Residential (18.279) regarding this objective.

Table 4.19
Multiple Comparisons for Objective Five
Games-Howell

(I) SummerProgram	(J) SummerProgram	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Mixed	Non-Residential	-20.76933	8.11200	.052	-41.6808	.1421
	Residential	20.11833*	4.26148	<.001	9.5368	30.6999
Non-Residential	Mixed	20.76933	8.11200	.052	-.1421	41.6808
	Residential	40.88767*	7.65461	<.001	20.7379	61.0374
Residential	Mixed	-20.11833*	4.26148	<.001	-30.6999	-9.5368
	Non-Residential	-40.88767*	7.65461	<.001	-61.0374	-20.7379

*. The mean difference is significant at the 0.05 level.

Objective Six

Using the collected data, a one-way between subjects ANOVA was conducted to determine a variance in the APR scores for Objective Six (Target percentage of participants who enrolled in a program of postsecondary education, by the fall term

immediately following high school graduation or by the next academic term as a result of acceptance by deferred enrollment, will attain either an associate or bachelor's degree within six years following graduation from high school) between UB programs with a Residential, Non-Residential, or Mixed summer program. This analysis was conducted to find if grants with one type of summer program produce greater APR scores over the baseline compared to the others. Descriptive statistics are presented in Table 4.20.

Table 4.20

Descriptives for Objective Six

					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Mixed	9	34.5322	18.66796	6.22265	20.1828	48.8817	.00	56.67
Non-Residential	12	33.5000	22.26493	6.42733	19.3535	47.6465	.00	60.00
Residential	36	25.5772	15.47202	2.57867	20.3422	30.8122	.00	55.00
Total	57	28.6591	17.70439	2.34500	23.9615	33.3567	.00	60.00

Table 4.21 shows that Levine's test was not significant, so the assumption of homogeneity of variance was met for this sample.

Table 4.21

Tests of Homogeneity of Variances for Objective Six

		Levene Statistic	df1	df2	Sig.
APR_Data	Based on Mean	2.046	2	54	.139
	Based on Median	2.035	2	54	.141
	Based on Median and with adjusted df	2.035	2	53.318	.141
	Based on trimmed mean	2.035	2	54	.141

ANOVA results, illustrated in Table 4.22, indicate that there is no significant effect of summer program type on objective six [$F(2,54) = 1.517$, $p = .229$].

Table 4.22

ANOVA for Objective Six

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	933.581	2	466.790	1.517	.229
Within Groups	16619.359	54	307.766		
Total	17552.940	56			

V. Discussion

Purpose of Study

The UB program was initiated through President Lyndon Johnson's War on Poverty and the accompanying Economic Opportunity Act of 1964 (Hampson, 2014; U.S. Department of Education, 2011). It is a massive initiative with a total of 70,711 high school students participating in the program during fiscal year 2020-2021 at an expense of $352,094,127 to taxpayers (U.S. Department of Education, 2021a). ED's own assessments and evaluations of the program, as well as the vast majority of conducted studies, have found the program to be an effective intervention. The extant research, however, almost exclusively assessed the success of individual UB programs or sought to ascertain the merit of the UB program as a whole. There was a gap in the research that compared UB programs and whether some were more effective in meeting programmatic objectives than others.

The purpose of this study was to compare the effectiveness of UB programs located within the Central Appalachian region to determine if there was a statistically significant difference between the three different summer program models in meeting the UB program's six APR objectives. The three different summer program models include residential, non-residential, and mixed. Nineteen grants within six states provided data for the study and this data was run in a separate ANOVA for each objective. These results were used to determine if there is a significant difference in the success in meeting program objectives of the different summer program models. These results, as well as the implications, limitations, and recommendations of this study, are presented in this chapter.

Initial Findings

This research study generally correlated with the existing body of literature finding the UB program to be effective. The participating grants largely met their identified objective percentages with scores well above the baseline. Thus, the majority of students represented in the study were more successful regarding UB's objectives than their peers. The effectiveness of the program has been demonstrated from the first UB evaluation in June of 1966 to this particular study (Blake, 1998; Laws, 1999).

Participating programs did see their performance data decrease towards the latter years of the grant cycle, but this is not entirely unexpected nor concerning. Programs not meeting an established objective(s) percentage is not necessarily indicative of failure. Target percentages are set somewhat arbitrarily when a UB grant is being written with guidance from ED consisting of simply looking at the baseline and setting an "ambitious yet attainable" target percentage. Thus, a program may fail to meet a target percentage for an objective but if its achieved score is above the baseline, this indicates that the grant's students were more successful regarding UB's objectives than their peers.

What I initially found surprising was that many programs' APR scores were *below* the baseline. On its face, this implies that UB students in these instances were less successful than those who did not receive the intervention. We begin to see this in the 2019-2020 APR data and especially in that for the 2020-2021 academic year. This is unsurprising since the COVID-19 pandemic undoubtedly impacted most facets of education.

It is important to note that the baseline scores for each UB grant in the 2017-2022 grant cycle are based on data from the year or even years prior to the start of the grant cycle. Due to the pandemic, the baseline for academic performance during the 2016-2017 academic year likely differs from that of 2020-2021. Since all UB programs experienced the pandemic, the impact COVID had on APR scores is irrelevant to the results of this study. It is, nonetheless, interesting to see that the data confirmed the negative impact that the pandemic had on the performance of Upward Bound programs and its students. This presents an area for future research.

Interpretation of Results

Objectives One, Three, and Six

The one-way between subjects ANOVA (and Welch for objective three) tests conducted for objectives one, three, and six indicated that there is no significant effect of summer program type on these three objectives. Thus, we cannot reject the null hypothesis that there is a significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region. These objectives are as follows:

Objective (1): Target percentage of participants served during the project year will have a cumulative GPA of 2.5 or better on a four-point scale at the end of the school year.

Objective (3): Target percentage of participants served during the project year will continue in school for the next academic year, at the next grade level, or will have graduated from secondary school with a regular secondary school diploma.

Objective (6): Target percentage of participants who enrolled in a program of postsecondary education, by the fall term immediately following high school graduation

or by the next academic term (e.g., spring term) as a result of acceptance by deferred enrollment, will attain either an associate or bachelor's degree within six years following graduation from high school.

Objective Two

Objective Two states that the "Target percentage of UB seniors served during the project year will have achieved at the proficient level on state assessments in reading/language arts and math" (U.S. Department of Education, 2016). Is there a significant difference in success in meeting program objective two between the different summer program models utilized by UB programs in the Central Appalachian region? Based on this study's findings (p-value of .012), we can reject the null hypothesis regarding this objective:

$H1_0$: There is no significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

The data showed a statistically significant difference between Non-Residential and Residential programs with Non-Residential programs (mean of 39.5) being more effective than Residential programs (mean of 24.1407) regarding this objective. Thus, students in UB programs that utilize a Non-Residential summer program model were more likely to be proficient on state assessments in reading/language arts and math than students participating in programs with a residential model.

It is important to note that this study's data was supplied by UB programs across six states. Any discussion regarding this objective needs to recognize a possible or

likely variance between state assessments. These differences may have impacted the results more so than the summer program model.

Objective Four

Objective Four states that the "Target percentage of all current and prior year UB participants, who graduated from high school during the school year with a regular secondary school diploma, will complete a rigorous secondary school program of study" (U.S. Department of Education, 2016). Is there a significant difference in success in meeting program objective four between the different summer program models utilized by UB programs in the Central Appalachian region? Based on this study's findings (p-value of <.001), we can reject the null hypothesis:

$H1_0$: There is no significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

The data showed a statistically significant difference between the Non-Residential and Residential models as well as between Non-Residential and Mixed. The means of Residential (29.024) and Mixed (28.9133) programs are significantly below that of Non-Residential programs (mean of 67.9033) regarding this objective. Students in UB programs that utilize a Non-Residential summer program model were more likely to graduate from high school having completed a rigorous secondary school program of study than students participating in programs with a Mixed or Residential model. Again, it is important to note that this study's data was supplied by UB programs across six states. Any discussion regarding this objective needs to note a possible or likely

variance between states' core curriculums. These differences may have impacted the results more so than the summer program model.

Objective Five

Objective Five states that the "Target percentage of all current and prior UB participants who graduated from high school during the school year with a secondary diploma will enroll in a program of postsecondary education by the fall term immediately following high school from an institution of higher education of acceptance by deferred enrollment until the next academic semester (e.g., spring semester)" (U.S. Department of Education, 2016). Is there a significant difference in success in meeting program objective five between the different summer program models utilized by UB programs in the Central Appalachian region? Based on this study's findings (p-value of <.001), we can reject the null hypothesis:

$H1_0$: There is no significant difference in success in meeting program objectives of the different summer program models utilized by UB programs in the Central Appalachian region.

The data showed a statistically significant difference between Non-Residential and Residential models as well as between Mixed and Residential. Based on the means, the APR scores of Non-Residential (59.1667) are statistically greater than Mixed (38.3973) which are statistically greater than Residential (18.279) regarding this objective.

Thus, students in UB programs who utilized a Non-Residential summer program model were more likely to graduate from high school and enroll in a program of postsecondary education by the fall term immediately following high school than those

participating in Mixed or Residential programs. It is also noteworthy that, statistically, it is more likely that students participating in a UB program with a Mixed summer component will immediately enroll in college for the fall after high school graduation than those participating in a Residential program.

Analysis

This study's results, which indicate a greater effectiveness for Non-Residential programs, is surprising and counterintuitive. UB summer programs are designed as a simulated college experience. One might anticipate that Residential programs would be most effective due to their greater intensity, closer fit to a simulated college experience, and the fact that the primarily daytime-only activities of Non-Residential programs (as well as part of the time for Mixed programs) does not differ much from the model of high school. There are several factors that may have contributed to this study's results.

This study's data cannot be divorced from the population it represents as well as that population's unique culture and characteristics. The Central Appalachian region of the United States is, indeed, plagued with persistent poverty, rampant unemployment, and desolate living conditions (Appalachian Regional Commission, 2017). Additionally, Hand and Payne (2008) found that educational attainment in the region is low, and the college-going rates of its high school students are correspondingly insufficient (Hand & Payne, 2008). The poor academic performance, low college-going rates, and lack of postsecondary success of Appalachian students can be attributed to barriers other than educational ability (Hand & Payne, 2008). UB has consistently been found to be an effective intervention that addresses these barriers. Why might Appalachian UB students in programs with a Non-Residential summer program model

perform better than peers participating in programs with other types of summer programs?

Lack of financial resources as well as the close family ties and collectivistic culture common within Appalachia serve as possible explanations regarding why Non-Residential summer program models are effective in Central Appalachia. Residential UB summer programs require students to live on a college campus for 5-6 weeks during the summer (with some allowing students to go home on weekends). This removes students for an extended period of time from their families and from a culture which strongly values family ties as well as connection to one's community (Keefe, 2005 & Grimard & Maddaus, 2004).

A Non-Residential program removes a student from their family and community for a few hours per day rather than for several days or weeks at a time. In this way, students can access and benefit from UB's resources without experiencing significant time away from family and community. Additionally, the norm in higher education (and in a residential, simulated college experience) in the United States is for students to be independent and strive for individual achievement. This is contrary to the characteristics of collective cultures that value the social group more than the individual (Gore & Wilburn, 2010). This insight provides further explanation regarding the success of a Non-Residential model for Appalachian UB students.

Additionally, it is worth noting that money can be a driving factor for low-income, Appalachian students (Hand & Payne, 2008). Since the overwhelming majority of UB participants come from low-income families, the students are often required to work while simultaneously attending school and participating in Upward Bound.

Residential UB summer programs require students to live on a college campus for 5-6 weeks during the summer (with some allowing students to go home on weekends). This negates a student's ability to work during a good portion of the summer which is an ideal time for them to make money either for themselves or their families. The non-residential model, which permits students to be at home on nights and weekends, more readily allows students to work while simultaneously participating in a UB summer program.

Financial struggles and the need to work over the summer to support one's family may explain why students who participate in a Non-Residential UB program display greater success regarding Objective Five. This objective states that the "Target percentage of all current and prior UB participants who graduated from high school during the school year with a secondary diploma will enroll in a program of postsecondary education by the fall term immediately following high school from an institution of higher education of acceptance by deferred enrollment until the next academic semester (e.g., spring semester)" (U.S. Department of Education, 2016). Students who work may be more inclined to obtain a college degree as soon as possible. In fact, Hand and Payne (2008) found that a family's low-income status is what drives many low-income students towards a college degree and the expected, corresponding financial gain.

Limitations

There are several limitations for this study. Preferably, every UB program in the region would have replied to my questionnaire which would have produced a larger set of data. However, 100% participation in any survey is extremely unlikely and the

percentage of respondents to my data request is typical. I reached out to the individual at ED who oversees UB APR data and I requested the relevant data for UB programs who did not respond to my request in order to create a larger data pool. This individual was slow to respond and the data that they eventually provided was incomplete. A follow-up request for the missing data went unanswered. Ideally, the number of participants in this study and the corresponding data pool would be larger.

It should also be noted that this study's data was provided by each UB program rather than from an outside entity such as ED. This potentially results in intentional or unintentional errors. For example, Grant #3 indicated that their program achieved a score of 0% for the 2019-2020 academic year for Objective Six. This is very likely a simple error but is one that impacted the data to a small degree. UB programs may also have provided incorrect data or chosen not to participate in this study if their APR data was not flattering for the program. It is also important to note that the data is from programs in Central Appalachia, so this study's results may not apply to other regions across the country.

Recommendations

ED's assessments and evaluations of UB as well as the vast majority of conducted studies have found the program to be an effective intervention. Nevertheless, the extant research almost exclusively measured the success of individual UB programs or sought to ascertain the merit of the UB program as a whole. There was a gap in the research that compared UB programs and attempted to determine whether some were more effective in meeting programmatic objectives than others. Thus, the purpose of this study was to compare the effectiveness of UB programs located within the Central

Appalachian region to determine if there was a statistically significant difference between the three different summer program models in meeting the six APR objectives.

This study found that UB programs that utilize a Non-Residential summer program model produce significantly better results than the alternate models of Mixed and Residential regarding objectives two, four, and five. While this study only utilized data from UB programs located in Central Appalachia (so results may not apply to other regions across the country), there is now research-based merit for utilizing the Non-Residential summer program model for Central Appalachian UB programs. The next grant cycle that institutions and agencies can write a UB grant for is for 2027-2032. As existing UB programs write continuation grants and potential new grant hosts write new applications, it is recommended that they consider utilizing a Non-Residential summer program model. This may require an adjustment to the counties served by continuation grants since it would be a challenge for students who live an hour or more away from the host institution to drive back and forth each day. Host agencies and institutions would need to elect to only serve schools in close proximity or plan to devote the significant funding required to bus students daily. Both of these options present challenges, but this research reveals the merit of employing a Non-Residential summer program model in the Central Appalachian region.

Further Research

There are a multitude of UB-related studies that have been conducted over the many decades of the program's existence. Nonetheless, there is a noteworthy gap in the literature. Additional studies need to be conducted that compare UB programs to one another and how their variances impact programmatic success.

To begin with, this study could be replicated in other regions. While my research found Non-Residential summer program models to be more effective than other models, this can only be assumed for the Central Appalachian Region. Studies conducted targeting other regions may arrive at completely different results. For example, APR results may be greater for Residential UB summer programs than other models in urban areas, the northeast, etc. This presents an option for future research.

APR data could also be utilized to compare other variances in UB programs. With the APR being a standardized instrument that all UB programs complete, it is an excellent resource for quantitative research. Studies could be conducted comparing the APR data of UB Classic programs and Upward Bound Math-Science programs to see if one group performs significantly better regarding the six APR objectives.

Additionally, as Rosecrance et al. (2019) state, further research is needed regarding the college-going rates and college retention of Appalachian students. Unfounded stereotypes about students within this region have emerged due to this deficiency in the literature (Terenzini et al., 1996). Further studies should be conducted in order to accurately portray this population as well as identify their unique barriers and supports for college access and success.

Implications

Upward Bound is a long-running intervention that has been shown to be effective in studies that focused on both individual programs as well as on the initiative as a whole. Abundant financial resources are invested into this college access program for low-income and potential first-generation college students. Any effort or ability to

improve the program and the outcomes of its participants is worthwhile to better serve this disadvantaged population and invest taxpayer dollars more effectively.

UB programs and their required services and overall structure are extremely standardized and, as the research has shown, these mandates have created a successful program. This study has shown that the limited variances in programs can produce different results. The implication is that some UB programs could be more effective by making a programmatic change that does not violate the guidelines outlined by ED. If differences were found between the effectiveness of the three different summer program models regarding APR results, it raises the question regarding the potential variances in the effectiveness of other aspects of the program that are not completely standardized.

As an example, all UB programs must offer instruction in a foreign language during the summer component. Programs can select what specific language they offer. Do students in a program who take one particular language produce better APR results than those who take another language? If so, should this be mandated as the language that all UB programs must offer during the summer component? The opportunities for future research that may result in ways to improve the UB initiative are infinite**.**

Conclusion

Participation in higher education typically affords low-income students with a pathway out of poverty. Individuals within this population enroll in higher education at a considerably lower rate than their middle and upper-class peers (Jean, 2011; Castleman et al., 2012). In order to address this discrepancy, abundant financial resources are invested into college access programs for secondary school students, such as the federally funded UB program.

The potential impact of these programs is immense. In fiscal year 2020-2021, a total of 70,711 high school students participated in a UB program. At least two-thirds of these individuals are both low-income and a potential first-generation college student (U.S. Department of Education, 2021a; Dortch, 2020).

Plentiful research has been conducted, over UB's many decades of existence, demonstrating the program's wide-ranging success in assisting low-income and first-generation students in successfully completing high school and being accepted into and attending higher education. There is an insignificant volume of research, however, that compares the effectiveness of the different summer program models utilized by UB programs. Most related research was designed to gauge the effectiveness of individual programs or of the program in general. This study addressed this gap in the literature.

The purpose of this study was to compare the effectiveness of the different summer program models utilized by UB programs. The results produced by this study are of value due to the fact that, if it is discovered that a summer program model is more successful in meeting program objectives than others, further research can be conducted regarding what precisely makes them more effective, and new UB grants can elect to adopt this model due to its demonstrated primacy. The one-way between subjects ANOVA (and Welch for objective three) tests conducted for this study for objectives two, four, and five indicated that there is a statistically significant effect of summer program type on these three objectives.

This study found that UB programs that utilize a Non-Residential summer program model produced significantly better results than the alternate models of Mixed and Residential regarding objectives two, four, and five. These results indicate that

there is merit for utilizing the Non-Residential summer program model for Central Appalachian UB programs and potentially other Appalachian regions as well. Lack of financial resources as well as the close family ties and collectivistic culture common within Appalachia serve as possible explanations regarding why Non-Residential summer program models are effective in Central Appalachia.

Residential UB summer programs require students to live on a college campus for 5-6 weeks during the summer (with some allowing students to go home on weekends). This takes students away from their families and from a culture which strongly values family ties as well as connection to one's community (Keefe, 2005 & Grimard & Maddaus, 2004). Additionally, UB students are often required to work. A Residential UB summer program model negates a student's ability to work during a good portion of the summer which is a prime time for them to make money either for themselves or their families.

The results of this study show the value in Appalachian UB programs utilizing the Non-Residential summer program model. The next grant cycle that institutions and agencies can write a UB grant for is 2027-2032. This research reveals that grant writing agencies should consider utilizing a Non-Residential summer program model in their grant applications.

This study contributed to the gap in research comparing UB programs with one another as well as added to a deficient number of studies related to Appalachian students. It also introduced the idea that APR data could be utilized to compare variances in UB programs. This is a worthwhile avenue of research since identifying variances within UB programs that produce meritorious results can result in more

programs employing this variance. Thus, an effective intervention for low-income and potential first-generation college students can be improved.

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