

A STUDY OF APPROACHES  
TO IMPROVE ADVANCED PLACEMENT  
SOCIAL STUDIES EXAMINATION STUDENT PERFORMANCE  
IN ONE URBAN FLORIDA HIGH SCHOOL

by

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## ABSTRACT

The purpose of this study was to investigate the efficacy of two instructional approaches, practice examinations and beyond-school-day tutoring, in improving Advanced Placement (AP) examination scores in AP U.S. History and AP World History in one urban Florida high school. AP U.S. History and AP World History examination scores of students who did and who did not participate in AP practice examination and AP beyond-school-day tutoring were analyzed to determine if the two instructional approaches to improving student examination performance were effective. Because the instructional approaches were implemented in one school within the school district of study, a purposive sample was used. Data collected included practice examination participation data, beyond-school-day tutoring attendance data, and AP U.S. History and AP World History examination scores for students enrolled in AP U.S. History and AP World History at the school of study (FHS) and the matched high school (MHS).

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# CHAPTER 1 THE PROBLEM AND CLARIFYING COMPONENTS

## Introduction

According to the College Board (2017), student participation in Advanced Placement (AP) coursework increased nationwide, from 32,566 students in 2003 to 80,175 in 2013. Enrollments in AP courses and examinations increased annually, from 1,464,254 students who took 2,533,431 examinations in 2007 to 2,741,426 students who took 4,957,931 examinations in 2017, an 87% increase in 10 years (College Board, 2017).

AP examinations are scored on a scale of one through five, with a score of three or higher considered to be successful completion for possible college credit (College Board, 2017). In Florida, the number of AP examinations administered rose from 208,825 in 2007 to 391,250 in 2017; of these, 201,799 received a score of three or higher, indicating a 51% success rate (College Board, 2017). The mean score on AP examinations in Florida in 2017 was 2.65 out of five possible points (College Board, 2017), below the score needed to potentially receive college credit. Additionally, although some progress had been made toward increasing access to AP courses nationwide, differences in participation and completion rates by students based on ethnicity and socioeconomic status still persisted well into the second decade of the 21<sup>st</sup> century (Light, 2016). One possible reason for the low success rate on AP examinations was the lack of support systems to ensure student success. Hallett and Venegas (2011) indicated that some students reported a low-quality experience in taking AP coursework, and that they were not prepared for the AP examinations.

A number of studies were focused on the efficacy of tutoring programs in various states to increase student scores on state standardized assessments and found mixed

results (Munoz, Chang, & Ross, 2012; Munoz, Potter, & Ross, 2008; Rothman & Henderson, 2011; Zimmer, Hamilton, & Christina, 2010). In Florida, Rajadhyax (2017) and Maestre (2015) examined the results of participation in tutoring and state assessment outcomes in middle and high schools respectively. As a follow-up to these two studies, the present study had a narrower focus. The relationship of student participation in practice examinations, beyond-school-day tutoring, and student performance on AP examinations was investigated. Specifically, the researcher examined all student examination results for those enrolled in AP U.S. History or AP World History in an urban Florida high school, hereafter referred to as FHS.

### Problem Statement

Data that generated this research were that 189,451 of the 391,250 AP examinations taken in Florida in 2017 were not successfully completed, meaning a score of 3 or greater was not assigned (College Board, 2017). This indicated that 49% of students participating in AP courses and taking AP examinations were not successfully completing AP examinations. According to Hallett and Venegas (2011), one possible explanation is that students were not being adequately prepared for AP examinations. Hallett and Venegas (2011) reported that many high school students, particularly in low-income and urban high schools, were ill-prepared for the AP examinations and had a poor quality AP experience (p. 474). Results of additional research in Florida suggested that increased attention should be given to providing the support systems necessary to ensure that students are equipped to succeed in AP coursework (Rowland & Shircliffe, 2016). Therefore, the problem studied in the present research was the lack of knowledge on approaches to increasing student AP examination scores.

### Purpose of the Study

The purpose of this study was to examine the efficacy of AP practice examinations and AP beyond-school-day tutoring in improving student performance on AP examinations. In particular, the researcher focused on AP U.S. History and AP World History examination results at one urban Florida high school (FHS).

### Significance of the Study

The impetus for the present research was to inform school district leaders and school level leaders regarding the efficacy of two instructional approaches, AP practice examinations and AP beyond-school-day tutoring, and to guide decisions on how best to increase AP examination results. A review literature resulted in mixed findings regarding the efficacy of tutoring programs (Munoz et al., 2012; Munoz et al., 2008; Rothman & Henderson, 2011; Zimmer et al., 2010). Furthermore, research into the efficacy of tutoring to support students in AP courses and on AP examinations was limited. The current study added to the body of knowledge by examining the efficacy of AP practice examinations and AP beyond-school-day tutoring in improving AP U.S. History and AP World History examination scores within one urban Florida's high school's AP program. Considering the 53% growth in the number of AP examinations taken by students in the state of Florida from 2007-2017 (College Board, 2017), understanding which instructional approaches were more effective in supporting students and improving their AP examination scores could have a potential impact on school and school district implementation of AP programs.

## Context of the Study

This section describes the context of the current study and is divided into three sections describing: a) the school of study (FHS), b) instructional approaches implemented at FHS, and c) the demographically matched high school (MHS).

### High School of Study (FHS)

Florida High School (FHS) is the pseudonym assigned to the large urban high school in Florida with a population of 2,507 students during the 2017-2018 school year (School District of Study, personal communication, November 6, 2018). FHS demographic data were obtained from the school district of study and indicated the student population ( $N = 2507$ ) was racially and ethnically diverse: 3% Asian, 9% White, 10% Black/African American, 76% Hispanic/Latino, 0% American Indian or Alaska Native, 0% Pacific Islander, and 2.0% Multiracial (personal correspondence, Director of Research, Evaluation, & Accountability, November 6, 2018). Additionally, 69.9% of students were classified as economically disadvantaged as determined by qualifying for free or reduced lunch through the National School Lunch Program (NSLP) (personal correspondence, Director of Research, Evaluation, & Accountability, November 6, 2018). FHS offered a choice of 15 AP courses during the 2017-2018 school year.

### Instructional Approaches Implemented at FHS

AP practice examinations and AP beyond-school-day tutoring were instructional approaches that were implemented in April and May of 2018 at FHS. Although AP practice examinations were in the third year of implementation within the school district, the 2017-2018 school year was the first year that AP practice examinations were implemented within the school day. Prior to the 2017-2018 academic year, AP practice examinations were administered after school or on Saturdays, and student participation

was voluntary. Additionally, the 2017-2018 school year was the first year during which practice examinations were administered to all AP students at FHS in one large testing session.

In April 2018, FHS implemented school-wide AP practice examinations for all students who participated in AP coursework. AP practice examinations were taken within the school day and administered by AP course teachers in a large centralized testing location located within the school media center. Following the examinations, teachers offered students an opportunity to provide anonymous feedback in written form wherein students indicated areas of the AP practice examination with which they had struggled.

The 2017-2018 school year was also the first year of implementation of a structured AP beyond-school-day tutoring program at FHS. Tutoring opportunities were offered after school and on Saturdays during the month following practice examinations. AP teachers used results of practice examinations and anonymous feedback forms to guide AP beyond-school-day tutoring content. Each AP teacher was offered 18 hours of paid time to tutor students following AP practice examinations, and prior to the AP examinations. Student participation in AP beyond-school-day tutoring opportunities were documented on attendance rosters and submitted to the assistant principal.

#### Matched High School (MHS)

MHS demographic data was also obtained from the school district of study and indicated the student population ( $N = 2838$ ) was racially and ethnically diverse: 2% Asian, 12% White, 13% Black/African American, 71% Hispanic/Latino, 0% American Indian or Alaska Native, 0% Pacific Islander, and 2.0% Multiracial (personal correspondence, Director of Research, Evaluation, & Accountability, November 6, 2018).



Additionally, 69.9% of students were classified as economically disadvantaged as determined by qualifying for free or reduced lunch through the National School Lunch Program (NSLP) (personal correspondence, Director of Research, Evaluation, & Accountability, November 6, 2018).

### Instructional Approaches Implemented at MHS

MHS also offered AP practice examinations; however, the examinations were either segmented and offered during class time or were offered on Saturdays outside of regular school hours. MHS also scheduled 30-minute sessions of additional support instruction for all students, within the school day, every Thursday during the 2017-2018 school year. MHS, however, did not have a formalized AP beyond-school-day tutoring program to provide support to students participating in AP courses.

### Definition of Terms

The following definitions are important to this study and provide clarification regarding how they are used:

Advanced Placement (AP): A high school curricular program, designed and overseen by the College Board and modeled after comparable college courses, which gives high school students access to 38 college-level courses, taught by qualified high school teachers. AP courses are followed by college-level examinations, scored by college and university faculty. Successful completion holds the potential for students to earn college credit while still in high school. (College Board, 2017).

AP Potential: A potential expectancy table calculated using Practice Scholastic Aptitude Test (PSAT) and National Merit Scholarship Qualifying Test (NMSQT) scores. PSAT and NMSQT scores show moderate to strong relationships to AP examination scores, and the expectancy table is used to predict the likelihood that

a student will earn a 3 or higher on a specific AP examination (College Board, 2015).

AP Practice Examinations: For the purpose of this study, AP practice examinations refer to College Board AP examinations from previous years, which are made available to AP teachers on the College Board website (College Board, 2018), and administered in their entirety in one session during the school day.

Archival Data: Information, previously collected by others, which is amenable to systemic study (Jones, 2010).

Beyond-School-Day Tutoring: For the purposes of this study, tutoring that occurs outside of the scheduled school day, either after school hours or on weekends.

Economically Disadvantaged: Students who are classified as having low socioeconomic status (SES) as determined by the qualification to receive free or reduced lunch as provided by the National School Lunch Program (FDOE, 2018).

English Learner (EL): A student who was not born in the United States, whose native language is not English, who comes from a home where a language other than English is spoken, or who is an American Indian or Alaskan native who comes from an environment where a language other than English has had a significant impact on his/her level of English proficiency. (Fla. Stat. § 1003.56(2)).

Open Access: A policy of allowing all students to enroll in AP courses of interest, without having taken prerequisite courses or having attained previous test score requirements (College Board, 2004).

### Conceptual Framework

In light of the continued growth of Advanced Placement (AP) enrollment within the state of Florida and the limited success rate of students on AP examinations (College

Board, 2017), the researcher determined that further study was needed regarding instructional approaches to improving student success, achieving a score of three or greater, on AP examinations. The urban high school of study implemented two instructional approaches to increasing student results on AP examinations: beyond-school-day tutoring and practice examinations. Consequently, for the purpose of this study, the conceptual framework focused on three components: (a) open access to AP coursework; (b) participation and performance in AP coursework; and (c) instructional approaches to improving student performance on examinations, particularly the use of tutoring and practice examinations. These three concepts framed the study and were related to approaches to increasing student AP examination results.

#### Open Access to Advanced Placement

Advanced Placement (AP) curricula were created in 1955 by the College Board to offer college-level coursework to especially talented and gifted high school students (Education Commission of the States, 2016). AP course offerings have expanded since their inception to include 38 courses in seven content areas in 2016 (Education Commission of the States, 2016).

The No Child Left Behind (NCLB) Act of 2001 introduced high stakes accountability measures linked to student performance on state standardized examinations with the intent of delivering nationwide school reform and improvement (NCLB, 2002). Subsequently, enrollments in AP coursework grew nationwide from 514,163 students taking 1.3 million examinations in 2003, to 1,003,430 students taking 3.1 million examinations in 2013 (College Board, 2014).

State accountability measures were designed to increase access to and participation in accelerated coursework, especially by low-income and minority students,

and to avoid school “district[s] use [of] accountability measures as tools to circumvent barriers to student access such as teacher gatekeeping and low parental and student expectations” (Rowland & Shircliffe, 2016, p. 407). In 2017, the Florida Department of Education (FDOE) used a formula for calculating school grades based on student performance on state standardized assessments (FDOE, 2018). Accelerated curricula and performance points for students passing accelerated coursework examinations contributed a potential 11% toward calculation of high school grade (Rowland & Shircliffe, 2016). Scoring a three or greater on AP examinations was one way that schools could earn acceleration points to increase school grades (FDOE, 2018). Thus, the more students who scored a three or greater on AP examinations, the more acceleration points a school could earn (FDOE, 2018). As a result, participation in AP courses continued to rise yearly, both nationwide and in Florida (College Board, 2017).

While state accountability measures were designed to increase access and equity in AP courses (Rowland & Schircliffe, 2016), it is educator and principal practices and perceptions regarding open access and the importance of the AP program which determined the number of students participating in AP courses (Bradshaw, 2010; King, 2010; Rowland & Shircliffe, 2016; Wood, 2010). Results of a study by King (2010) indicated that educators were in agreement with open access policies for all students who exhibited high levels of interest in participation; however, educators did not support mandatory AP requirements for all students. Hallett and Venegas (2011) found that when more students participated in AP courses, student performance on AP examinations decreased.

Conversely, a study by Bradshaw (2010) examined the relationship between principals’ reports of practices regarding open enrollment in AP courses and student

performance results in Florida. Results indicated that access and equity practices, open enrollment practices, and principal attitudes toward the AP program were all accurate predictors of student enrollment in AP courses and of student success on AP examinations (Bradshaw, 2010).

### Participation and Performance in Advanced Placement

#### National

Although 85% of students in the United States attended schools that offered AP courses and examinations in 2008, few students chose to participate (Handwerk, Tognatta, Coley, & Gitomer, 2008). Nationwide focus on increasing participation in all AP courses and examinations resulted in steady increases in participation, but differences in participation by ethnicity and socioeconomic status still existed in 2016 (Light, 2016). Participation in nine history and social studies AP courses also increased with 1,680,403 students participating in the 2016-2017 school year (College Board, 2017). AP history and social studies courses offered during the 2016-2017 academic year included: (a) AP Comparative Government and Politics, (b) AP European History, (c) AP Human Geography, (d) AP Macroeconomics, (e) AP Microeconomics, (f) AP Psychology, (g) AP United States Government and Politics, (h) AP United States History, and (i) AP World History (College Board, 2017). National statistics on 2016-2017 participation in AP U.S. History and AP World History were 505,302 and 298,475 students, respectively (College Board, 2017).

#### Florida

Participation in AP examinations continued to increase in the state of Florida, from 53,816 examinations taken in 2008 to 391,250 examinations taken in 2017 (College Board, 2017). Results of the 2017 AP examination administration indicated a 51%

success rate on AP examinations, by scoring a three or greater out of five on a five-point scale, with a mean score of 2.65 (College Board, 2017). In 2017-2018, the total number of students in Florida who participated in AP U.S. History was 34,490, with 15,458 (45%) students scoring a three or greater on a five-point scale on the AP U.S. History examination. The total number of Florida students who participated in AP World History in 2017-2018 was 31,540, with 15,373 (49%) scoring a three or greater on a five-point scale on the AP World History examination.

The continued growth in AP programs may be due, in part, to investment in AP programming by the Florida Legislature (College Board, 2014). The Florida Legislature provided incentive funding to schools and districts to pay for AP examinations for students enrolled in AP courses funded by the Florida Partnership which provided assistance to schools with highly underrepresented populations [FLA. STAT. § 1007.27 (5) (2018)]. A statewide agreement for ensuring that students received college credit for examination scores of three and above was also provided by the Florida Legislature to promote participation in AP courses [FLA. STAT. § 1007.27 (6) (2018)].

#### Effects of Participation and Performance

The results of research regarding the effects of participation in AP courses and AP examinations in high school have been mixed. Adelman (1999), suggested, mere exposure to a rigorous curriculum, even without passing the examination, is helpful for individual students and increases their chances of success in college (p. 39). Research conducted by Flowers (2008) indicated that AP program participation was associated with higher college entrance examination scores, undergraduate grade point averages, postsecondary attainments, and student life income (p.128). According to Jobs for the Future (2008), being exposed to a rigorous curriculum in high school has been a better

predictor of success in college than education level of the parents, test scores, or grade point average. Furthermore, a report by the Education Commission of the States (2016) indicated positive potential outcomes on student college preparedness, high school and college completion rates, and an advantage in the college admission process for students who participated in AP courses.

In a brief written for Education Partnerships, Inc., Hansen (2005) stated that all students should have access to AP courses; however, adequate student preparation and a system of student supports needs to be put into place to accommodate the rapid expansion of the AP program. Furthermore, The National Center for Educational Achievement (2010) suggested that simple comparisons between AP and non-AP students can be misleading, and that simply participating in AP courses was not predictive of post-secondary success, but rather of taking AP courses and passing AP examinations. In addition, Hallett and Venegas (2011), indicated that AP students in low-income and ethnically diverse urban schools reported a low-quality AP experience and believed they were not prepared for AP examinations.

In contrast to the findings of Wood (2010), a relevant study in Florida investigated the relationship between principals' reports of practices regarding open enrollment in AP courses and student performance results on AP examinations in Central Florida (Bradshaw, 2010). Results of the study indicated that collectively, access practices, open enrollment practices, and perceived importance of the AP program were good predictors of enrollment in AP courses and examinations (p. 117). As schools increased access and equity in AP programs, student enrollment and performance increased (Bradshaw, 2010).

## Instructional Approaches to Improving Student Performance

Cognitive sciences, the study of how learners actively construct and retain knowledge, had been the basis for research into instructional approaches to improve student learning (Intentional Futures, 2015). Researchers identified instructional approaches that can result in positive outcomes with respect to student performance (Hattie, 2009; Intentional Futures, 2015). Eight principles of learning science were identified by Intentional Futures (2015). Of the eight principles of learning science, deliberate practice ( $d = 0.71$ ), feedback ( $d = 0.73$ ), and testing effect ( $d = 0.34$ ) are discussed in this section due to the effect size of these instructional approaches in improving student achievement (Hattie, 2009).

Deliberate practice referred to extensive engagement in relevant practice activities in order to improve performance (Hattie, 2009). Such practice involved goal-setting, an appropriate level of challenge, and sufficient and continued practice (Intentional Futures, 2015).

Feedback referred to detailed and actionable information regarding performance (Intentional Futures, 2015). Feedback should flow from student to teacher about what students did and did not understand so that teaching can be designed to address gaps in learning (Hattie, 2009). Additionally, elaborated feedback, which involved providing additional information to foster a deeper understanding of the material, was more effective than providing the correct response alone (Finn, Thomas, & Rawson, 2018). Finn et al. (2018) found that when more information was available, students could better understand why they were wrong and correct errors in understanding, thereby facilitating the retention of correct information.



Hattie (2009) referred to testing as another form of feedback, so long as teachers used information from testing to modify instruction and attend to gaps in learning. Research indicated that instructional approaches that involved testing were more effective than simply re-studying material because they focused on retrieval processes and post-retrieval re-encoding, processing mechanisms through which retention was enhanced (Liu, Tan, & Reder, 2018).

Hattie, in a 2009 meta-analysis relating to achievement, synthesized research on instructional strategies to improve student learning. Feedback was one of the most powerful influences on student achievement, especially when given from student to teacher about what students did and did not understand (Hattie, 2009).

For the purposes of this study, practice examinations and tutoring opportunities formed one such feedback loop, where Advanced Placement (AP) practice examination results were considered feedback, and AP tutoring content was informed by results of AP practice examinations. AP practice examinations served as formative assessment of learning, which guided teacher decision-making about what to teach in AP tutoring opportunities. Although there have been a variety of approaches used to improve student performance (Hattie, 2009), this study focused on two, practice examinations and beyond-school-day tutoring, which were implemented at the urban Florida high school (FHS) that was the target of this research.

### Practice Examinations

Kulik, Kulik, and Bangert (1984) found in their meta-analysis of the effects of participating in practice forms of aptitude and achievement examinations, that effects of testing were greater if the practice examination was of a parallel form to the actual

examination. The researchers also reported that student success increased with the number of practice tests and was larger for subjects of high ability (Kulik et al., 1984).

More recently, Dotson, Sheldon, & Sherman (2010) indicated that student performance on examinations improved when students completed more practice questions accurately, participated in practice examinations, and when the review activities more closely resembled the actual exam. Additionally, Dotson et al. (2010) found that students who completed the practice examination scored higher on the actual examination than students who participated in a material review with the instructor.

In a study of strategies to boost learning, Dunlosky (2013) indicated that the two most highly rated strategies for improving student learning were practice testing and distributed practice. Dunlosky's (2013) reasoning for the efficacy of the approaches was that they helped students of any age and enhanced comprehension and learning in a wide variety of subject areas, thereby increasing student achievement. Using practice examinations improved student learning by forcing students to retrieve answers, which directly affected long-term memory and signaled areas in need of further improvement if the correct answer could not be retrieved (Dunlosky, 2013).

Hattie (2017) provided a caveat, stating that feedback from testing must be used by teachers to modify instruction and attend to gaps in learning to improve student performance. Several high effect size strategies for improving student achievement were identified, including deliberate practice ( $d = 0.79$ ), evaluation and reflection ( $d = 0.75$ ), feedback ( $d = 0.70$ ), and spaced practice ( $d = 0.60$ ) (Hattie, 2017). Hattie believed that seeking negative evidence and using it to drive instruction made a difference (Hattie, 2009). The use of practice examination results to guide tutoring opportunities combines all of the aforementioned high effect size instructional approaches.

### Beyond-School-Day Tutoring

Hattie (2009) defined spaced practice as the frequency of different opportunities rather than merely spending more time on task (p. 185). Hattie (2009) reported that spaced practice was an instructional approach which had a high desired effect size ( $d = 0.71$ ) on student learning. Dunlosky (2013) and Hattie (2009) concluded that students retained knowledge for a longer period of time when practice was distributed over a longer period of time. Tutoring is one method of providing distributed practice opportunities.

Results of studies on the efficacy of tutoring programs to improve student achievement were mixed (Maestre, 2015; Munoz, Potter, & Ross, 2008; Munoz, Chang, & Ross, 2012; Rajadhyax, 2017; Rothman & Henderson, 2011; Zimmer, Hamilton, & Christina, 2010). In an examination of the effect of supplemental educational services programs on student achievement in fourth-, seventh-, and tenth-grade reading, and fifth- and eighth-grade mathematics in an urban school district in Kentucky, Munoz et al. (2008) found non-significant effects as well as quality concerns. Zimmer et al. (2010), studying the effectiveness of two tutoring programs in the Pittsburgh Public School District, found that the effects of tutoring were statistically significant for mathematics but not for reading across all models. In Pittsburgh's Educational Assistance Program (EAP), results were mixed across models for both mathematics and reading (Zimmer et al. 2010). Additionally, Zimmer et al. (2010) found a statistically significant relationship when tutoring instruction was designed to address gaps in previous student learning in reading.

A study by Halpern, Graesser and Hakel (2007) indicated that an indirect benefit of frequent testing was that it kept students engaged and improved the transfer of learning

if frequent testing was accompanied by performance feedback. In an examination of undergraduate students Dotson, Sheldon, & Sherman (2010) found that students who attended an active review session of course material and examination expectations outperformed students on the final examination in contrast to those who attended a question and answer style review session. Furthermore, students who took unit practice examinations scored an average of 12% higher than did those who did not attend unit practice examinations (Dotson et al., 2010).

In a school district after-school tutoring program in urban New Jersey, researchers found that eighth-grade students who participated in tutoring outperformed those who did not in both reading and mathematics (Rothman & Henderson, 2011). Additionally, Munoz et al. (2012) conducted a follow-up study of their 2008 Kentucky study to determine if the effect of tutoring in middle school reading and mathematics improved with program refinement and maturity. Munoz et al. (2012) determined that it was unclear whether tutoring positively impacted student achievement due to finding only weak or modest effects in increasing student achievement in reading and mathematics.

In 2015, Maestre conducted a study to determine if a significant relationship existed between low SES students' participation in an after-school high school tutoring program and student outcomes on standardized tests in Florida. The results of Maestre's (2015) study indicated that there existed a varying threshold, based on subject area, of the requisite number of hours of tutoring required in order for positive effects on student achievement to occur.

Rajadhyax (2017) conducted a similar study to that of Maestre (2015), examining the relationship between participation in a school-based tutoring program at three middle schools in Central Florida, and changes in student outcomes on the Florida Standards

Assessment (FSA) in Mathematics and English Language Arts (ELA). No statistically significant difference existed between students who did and did not participate in tutoring for FSA ELA and FSA Mathematics. The researcher did, however, identify the number of hours of tutoring which resulted in the greatest mean change in achievement for FSA Reading and FSA Mathematics (Rajadhyax, 2017).

Results of studies on the efficacy of tutoring to improve student performance on standardized examinations were mixed (Maestre, 2015; Munoz, Potter, & Ross, 2008; Munoz, Chang, & Ross, 2012; Rajadhyax, 2017; Rothman & Henderson, 2011; Zimmer, Hamilton, & Christina, 2010). Maestre (2015) and Rajadhyax (2017) did indicate, however, that there may have existed a threshold of the number of hours of tutoring needed before positive results occurred. Maestre (2015), Munoz et al., (2012), and Rajadhyax (2017) cautioned that further research was required to determine the most effective delivery method and duration of tutoring opportunities to increase student achievement. Additionally, the researchers commented on a dearth of research examining the combination of practice examinations to guide tutoring content.

### Research Questions

The research questions were designed to determine the efficacy of two instructional approaches, either independently or in tandem, to improving AP examination results. The following questions were used to guide this study:

1. What differences exist between AP U.S. History and AP World History examination scores of students who did and did not participate in AP U.S. History and AP World History practice examinations at one urban Florida high school during the 2017-2018 school year?

2. How do AP examination scores of students who participated in AP beyond-school-day tutoring program compare to AP examination scores of students who did not participate in AP beyond-school-day tutoring, for AP U.S. History and AP World History, at one urban Florida high school during the 2017-2018 school year?
3. What is the relationship between the frequency of student participation in AP beyond-school-day tutoring and AP U.S. History and AP World History examination scores in one urban Florida high school, during the 2017-2018 school year?
4. How do AP U.S. History and AP World History examination scores compare for the urban Florida high school to be studied (FHS) and a demographically matched high school (MHS) that did not implement AP beyond-school-day tutoring, in one urban Florida school district?
5. How do AP U.S. History and AP World History examination results for the 2017-2018 school year compare to AP U.S. History and AP World History examination results from the 2016-2017 school year, prior to implementation of AP practice examinations and AP beyond-school-day tutoring for the same urban Florida high school?

### Methodology

A quantitative study was conducted within an urban Florida school district using archival data for the 2016-2017 and 2017-2018 academic years, to determine if AP practice examinations and AP beyond-school-day tutoring related to changes in AP examination scores. AP beyond-school-day tutoring occurred at only one urban Florida high school (FHS) within the school district. Both descriptive and inferential statistics

were completed to determine whether differences existed between examination scores of students who did and did not participate in AP practice examinations and AP beyond-school day tutoring.

### Population and Sample

The population for this study consisted of all students ( $N = 16,801$ ) within one urban Florida public school district who were enrolled in one of seven comprehensive high schools during the 2017-2018 school year. A purposive sample was selected from Florida High School (FHS) as it was in its first year of implementation of Advanced Placement (AP) practice examinations, administered during the school day, used to guide content of AP beyond-school-day tutoring. Although AP practice examinations had been administered previously, they had never been administered during the school day in one large testing session.

Additionally, this was the first year of implementation of AP beyond-school-day tutoring following the AP practice examinations, where tutoring content was guided by AP practice examination results. The matched high school (MHS) was selected as the comparison high school based on school size, ethnicity, EL student percentage, and socioeconomic status.

The purposive sample consisted of all students at the FHS ( $n = 304$ ) and MHS ( $n = 175$ ) who were enrolled in AP U.S. History or AP World History, and who participated in the AP U.S. History or AP World History examinations during the 2017-2018 academic year. Students enrolled in AP U.S. History ( $n = 190$ ) and AP World History ( $n = 135$ ) at FHS, were selected as the focus of this study as AP U.S. History and AP World History courses had the highest enrollment numbers. Table 1 lists, by course, the 10 AP courses at FHS with the highest enrollment numbers.

Table 1

*Florida High School (FHS) Rank Order Enrollment of AP Courses: 2017-2018*

Rank Order	Advanced Placement (AP) Courses	Enrollment
1	AP U.S. History	190
2	AP World History	135
3	AP Human Geography	101
4	AP Macroeconomics	79
5	AP U.S. Government	78
6	AP Spanish	64
7	AP English Literature & Composition	42
8	AP English Language & Composition	38
9	AP Biology	37
10	AP Computer Science Principles	26

Student demographic variables used to match the two high schools included ethnicity, English Learner (EL) status, and socioeconomic status. The researcher examined the size and demographic composition of all seven of the comprehensive high schools in the large Florida school district. MHS was determined to be the most closely matched high school based on the aforementioned characteristics. The most recent demographic comparison data of FHS and MHS was received from the school district (Research, Evaluation, & Accountability, personal communication, November 6, 2018) and is displayed in Table 2. The demographic composition of FHS and MHS were within 5% of one another on all demographic variables, including number of ELs.



Table 2

*2018 Demographic Variables: Florida High School (FHS) and Matched High School (MHS)*

Demographic Variables	Florida High School %	Matched High School %
Ethnicity		
White	9	12
Black or African American	10	13
Hispanic/Latino	76	1
Asian	3	2
Native Hawaiian/Other Pacific Islander	0	0
American Indian of Alaska Native	0	0
Two or More Races	2	2
English Learner (EL)	17.6	18.1
Total Enrollment	2,507	2,838

#### Procedures

Approval from the Institutional Review Board at the University of Central Florida was acquired (Appendix A) prior to applying for approval to collect data from the Florida school district of the high school (FHS) of study. Approval from the school district was sought and received (Appendix B) to access: (a) 2017-2018 AP examination scores in AP U.S. History and AP World History for FHS and MHS, (b) 2016-2017 AP U.S. History and AP World History examination scores for FHS, (c) 2017-2018 archival AP practice examination data and attendance from FHS, and (d) 2017-2018 archival AP beyond-school-day tutoring attendance for FHS. The following descriptions of the procedures used for data collection and analysis have been organized around the five research questions which guided the study.

#### Data Collection

Data on AP practice examination participation and AP beyond-school-day tutoring attendance were collected from archival data made available to the researcher by

the school-based assistant principal at FHS (Berg, 2004). AP practice examination data and AP beyond-school-day tutoring data were aggregated and sent to the Research, Evaluation, and Accountability department at the school district, where these data were combined with student AP examination scores. To ensure student anonymity, data were de-identified before being returned to the researcher.

Research Question 1: What differences exist between AP U.S. History and AP World History examination scores of students who did and did not participate in AP U.S. History and AP World History practice examinations at one urban Florida high school during the 2017-2018 school year?

Archival attendance records and AP practice examination records from FHS were used to determine which students participated in AP practice examinations for AP U.S. History and AP World History. Data were analyzed to determine what differences, if any, existed between mean scores of students who participated in AP practice examinations and students who did not participate.

Research Question 2: How do AP examination scores of students who participated in AP beyond-school-day tutoring program compare to AP examination scores of students who did not participate in AP beyond-school-day tutoring for AP U.S. History and AP World History at one urban Florida high school during the 2017-2018 school year?

Archival AP beyond-school-day tutoring attendance data from FHS were used to determine those students who participated in AP beyond-school-day tutoring and those who did not. Data for the two groups were compared to determine what differences, if any, existed in the mean AP examination scores of the two groups.

Research Question 3: What was the relationship between the frequency of student participation in AP beyond-school-day tutoring and AP U.S. History and AP World

History examination scores, in one urban Florida high school during the 2017-2018 school year?

For students who did participate in AP beyond-school-day tutoring, the number of tutoring sessions attended were examined in conjunction with AP examination scores for AP U.S History and AP World History. Each beyond-school-day tutoring opportunity was two hours in duration, and the number of sessions attended was recorded. Data were examined to determine if a relationship existed between number of sessions of tutoring attended and AP examination scores.

Research Question 4: How do AP U.S. History and AP World History examination scores compare for the urban Florida high school to be studied (FHS) and a demographically matched high school (MHS) that did not implement AP beyond-school-day tutoring, in one urban Florida school district?

De-identified AP U.S. History and AP World History examination scores for FHS and MHS were obtained from the school district of study for the target and matched high schools. Mean AP U.S. History and AP World History examination scores of students at FHS and MHS were analyzed to determine what differences, if any, existed between the two groups.

Research Question 5: How do AP U.S. History and AP World History examination results for the 2017-2018 school year compare to AP U.S. History and AP World History examination results from the 2016-2017 school year, prior to implementation of AP practice examinations and AP beyond-school-day tutoring for the same urban Florida high school?

De-identified 2016-2017 and 2017-2018 AP U.S. History and AP World History examination scores of FHS students were obtained from the school district of study.

Mean AP examination scores of students at FHS for the 2016-2017 and 2017-2018 school years were analyzed to determine what differences, if any, existed between the two groups. Data sources, organized by research question, are summarized in Table 3.

Table 3

*Research Questions and Sources of Data*

Research Question	Sources of Data
1. What differences exist between AP U.S. History and AP World History examination scores of students who did and did not participate in AP U.S. History and AP World History practice examinations at one urban Florida high school during the 2017-2018 school year?	School-based archival practice examination and attendance data and school-based AP examination scores for the 2017-2018 academic year
2. How did implementation of an AP beyond-school-day tutoring program relate to change in AP U.S. History and AP World History examination scores at one large Florida high school during the 2017-2018 school year?	School-based archival AP beyond-school-day tutoring attendance data and school-based AP examination scores for the 2017-2018 academic year
3. What was the relationship between the frequency of student participation in AP beyond-school-day tutoring and AP U.S. History and AP World History examination scores in one large Florida high school during the 2017-2018 school year?	School-based archival AP beyond-school-day tutoring attendance data and school-based AP examination scores for the 2017-2018 academic year
4. How do AP U.S. History and AP World History examination scores compare for the urban Florida high school to be studied (FHS) and a demographically matched high school (MHS) that did not implement AP beyond-school-day tutoring, in one urban Florida school district?	School-based archival AP practice examination, and AP beyond-school-day tutoring attendance data and school district-based AP examination data for the 2017-2018 academic year
5. How did AP U.S. History and AP World History examination results for the 2017-2018 school year compare to AP U.S. History and AP World History examination results from 2016-2017 school year, prior to implementation of practice examinations and beyond-school-day tutoring at one large Florida high school?	2017-2018 and 2016-2017 school-based AP examination scores

Instrumentation

AP courses and examinations were developed by committees comprised of college faculty and AP teachers to ensure that courses and examinations were modeled after college-level expectations for comparable courses (College Board, 2017). The

committee was informed by data collected from a wide range of post-secondary institutions in order to ensure that course content reflected current equivalent post-secondary courses (College Board, 2017). Additionally, committee members designed examination specifications and questions to ensure that items were aligned with AP course curricula. College Board (2017) used feedback from secondary and post-secondary institutions to ensure that students received a college-level AP experience.

AP examinations were scored by machine for multiple-choice items, and by college faculty and expert AP teachers for free response items (College Board, 2017). The scoring of free responses was monitored by chief readers to ensure fairness and consistency (College Board, 2017). Weighted scores for both multiple-choice and free response items were combined to generate a composite score which was then converted to an AP examination score, ranging from one through five, where a three or higher was considered to be successful completion for possible college credit (College Board, 2017). College Board (2017) described the scoring process as follows:

In general, the AP composite score points are set so that the lowest weighted score needed to earn an AP Exam score of 5 is equivalent to the average score among college students earning grades of A in the college course. Similarly, AP Exam scores of 4 are equivalent to college grades of A<sup>-</sup>, B<sup>+</sup>, and B. AP Exam scores of 3 are equivalent to college grades of B<sup>-</sup>, C<sup>+</sup>, and C. (College Board, 2017, p. 3).

Research by College Board (2013) established the validity of using passing AP examination scores for college credit in a comparable introductory college course. Additionally, Reshetar and Melican (2010) found AP examinations to be internally consistent and reliable across all AP subject areas.

The AP practice examinations used at FHS were previous AP examinations which were released by College Board. AP practice examinations were made available to AP teachers on the College Board website.

### Data Analysis

Both descriptive and inferential statistics were used to determine if a relationship existed between participation in AP practice examinations and AP beyond-school-day tutoring, and subsequent AP U.S. History and AP World History examination scores. The effects of the instructional approaches were studied, both separately, and in tandem. The quantitative methods used to analyze data are presented for each of the five research questions which guided the study and have been summarized in Table 4.

Research Question 1: What differences exist between AP U.S. History and AP World History examination scores of students who did and did not participate in AP U.S. History and AP World History practice examinations at one urban Florida high school during the 2017-2018 school year?

To answer Research Question 1, the mean AP U.S. History and AP World History examination scores were compared for students who did and did not participate in AP practice examinations at FHS, during the 2017-2018 school year. An independent samples t-test was conducted to determine if a statistically significant difference existed between the means of students who did and did not participate in AP practice examinations. Results were reported using a probability level of  $p < .05$ . Mean AP U.S. History and AP World History examination scores were also compared by demographic subgroups, including ethnicity and socioeconomic status, for students who did and did not participate in AP practice examinations.

Research Question 2: How do AP examination scores of students who participated in AP beyond-school-day tutoring program compare to AP examination scores of students who did not participate in AP beyond-school-day tutoring for AP U.S. History and AP World History at one urban Florida high school during the 2017-2018 school year?

To answer Research Question 2, an independent samples t-test was used to compare mean AP U.S. History and AP World History examination scores of students at FHS who did and did not participate in AP beyond-school-day tutoring during the 2017-2018 school year. Results were reported at probability level of  $p < .05$ . Mean AP U.S. History and AP World History examination scores were also compared by demographic subgroups, including ethnicity and socioeconomic status, for students who did and did not participate in AP beyond-school-day tutoring.

Research Question 3: What is the relationship between the frequency of student participation in AP beyond-school-day tutoring and AP U.S. History and AP World History examination scores in one urban Florida high school during the 2017-2018 school year?

The frequency of participation in AP beyond-school-day tutoring was investigated to determine if frequency of participation had an influence on AP U.S. History and AP World History examination scores, for the 2017-2018 school year at FHS. A Pearson Correlation was used to analyze whether a relationship existed between frequency of participation in AP beyond-school-day tutoring, and AP examination scores in AP U.S. History and AP World History at FHS.

Research Question 4: How do AP U.S. History and AP World History examination results compare for the urban Florida high school to be studied (FHS) and a



demographically matched high school (MHS) that did not implement AP beyond-school-day tutoring, in one urban Florida school district?

An independent samples t-test was used to compare mean FHS AP U.S. History examination scores to mean MHS AP U.S. History examination scores. An additional independent samples t-test was used to compare mean FHS AP World History examination scores to mean MHS AP World History examination scores. Results were conducted using a  $p < .05$  probability level. Student demographic variables to determine the match included economic status, ethnicity, and English Learner (EL) status. Mean AP U.S. History and AP World History examination scores were also compared by demographic subgroups, including ethnicity and socioeconomic status, for students at FHS and MHS.

Research Question 5: How do AP U.S. History and AP World History examination results for the 2017-2018 school year compare to AP U.S. History and AP World History examination results from the 2016-2017 school year, prior to implementation of AP practice examinations and AP beyond-school-day tutoring for the same urban Florida high school?

An independent samples t-test was conducted to compare mean AP U.S. History and AP World History examination scores at FHS for the 2017-2018 and 2016-2017 academic years, prior to and after the implementation of AP beyond-school-day tutoring. Results were reported using a probability level of  $p < .05$ . Mean AP U.S. History and AP World History examination scores were also compared by demographic subgroups, including ethnicity and socioeconomic status, for FHS students from the 2016-2017 and 2017-2018 academic years.

Table 4

*Research Questions and Methods of Analysis*

Research Question	Method of Analysis
1. What differences exist between AP U.S. History and AP World History examination scores of students who did and did not participate in AP U.S. History and AP World History practice examinations at one urban Florida high school during the 2017-2018 school year?	Independent samples t-test
2. How does implementation of an AP U.S. History and AP World History beyond-school-day tutoring program relate to change in AP U.S. History and AP World History examination scores at one large Florida high school during the 2017-2018 school year?	Independent samples t-test
3. What is the relationship between the frequency of student participation in AP beyond-school-day tutoring and AP U.S. History and AP World History examination scores in one large Florida high school during the 2017-2018 school year?	Pearson Correlation
4. How do AP U.S. History and AP World History examination scores compare for the urban Florida high school to be studied (FHS) and a demographically matched high school (MHS) that did not implement AP beyond-school-day tutoring, in one urban Florida school district?	Independent samples t-test
5. How do AP U.S. History and AP World History examination results for the 2017-2018 school year compare to AP U.S. History and AP World History examination results from 2016-2017 school year, prior to implementation of practice examinations and beyond-school-day tutoring at one large Florida high school?	Independent samples t-test

Delimitations

Only students enrolled in AP U.S. History and AP World History courses in two urban Florida high schools, FHS and MHS, who also participated in subsequent AP examinations, were included in the sample. In the current study, the researcher examined the relationships between participation in AP practice examinations, AP beyond-school-

day tutoring, and subsequent student AP examination scores for students enrolled in AP U.S. History and AP World History at FHS. Because instructional approaches were implemented at only one high school in the urban Florida school district, the samples were restricted to students who (a) attended FHS and MHS, (b) were enrolled in AP U.S. History and AP World History, and (c) participated in AP examinations for those courses.

### Limitations

Limitations existed within the current research study, as it focused on AP U.S. History and AP World History examination results collected from two urban Florida high schools within one large Florida school district. As a result, generalization of data was limited to school districts with similar demographic compositions and after careful consideration of school district characteristics.

The populations of students at FHS and MHS were not randomly assigned or matched based on demographic variables or previous examination performance. Rather, it was assumed, based on the demographic match of the schools, that the two populations would be similar.

Finally, the validity of the AP practice examinations used at FHS could not be determined. Although the AP practice examinations used were previous AP examinations, content and examination structure could have changed since they were administered, and the examinations may not have accurately reflected current AP examinations for AP U.S. History and AP World History.

### Assumptions

The current study included the following assumptions:

1. The student populations that participated in AP U.S. History and AP World History at the large Florida high school (FHS) in 2017-2018 and 2016-2017 were similar.
2. AP teachers were objective when grading AP practice examinations and kept accurate records of student AP practice examination scores.
3. AP teachers used feedback data from students and practice examination scores to guide the structure of tutoring opportunities.
4. AP teachers kept accurate attendance data for students attending AP beyond-school-day tutoring
5. 2016-2017 AP U.S. History and AP World History practice examinations and 2017-2018 AP U.S. History and AP World History examinations were valid and reliable measures of student learning.

### Organization of the Study

The report for this research study has been organized into five chapters. Chapter 1 includes an introduction and the statement of the problem to be researched, the purpose statement, significance of the study, definition of terms, research questions, conceptual framework, methodology, limitations and delimitations, and assumptions. Chapter 2 includes an extensive review of the literature related to the conceptual framework. Chapter 3 contains a description of the methodology, procedures, data collection, and analysis procedures used. Chapter 4 includes the results of the analysis of data gathered to respond to each of the five research questions. Chapter 5 provides a summary of the

study, discussion of findings, possible implications of the findings, and suggestions for further research.

### Summary

The number of students who participated in AP courses and AP examinations has continued to rise yearly, both nationally and in the state of Florida. In Florida, school and district accountability measures were calculated in part by earning acceleration points for student participation in rigorous coursework, such as AP, and successful completion of subsequent examinations. As a result, student participation in AP courses continued to rise, however, student success on AP examinations, as evidenced by achieving a score of three or greater on a five-point scale, remained low. Research on instructional approaches for supporting students enrolled in AP courses has the potential to provide instructional leaders with valuable data on how to best improve the success rate of students on AP examinations. Results of this research were intended to aid school district and school level personnel in determining how to best support students enrolled in AP coursework who participate in AP examinations.

## CHAPTER 2 REVIEW OF THE LITERATURE

### Introduction

This chapter presents the need for research regarding the efficacy of instructional approaches to support students in Advanced Placement (AP) courses. The review of the literature contained in this chapter provides a synthesis of research relating to the three concepts introduced in the conceptual framework: (a) open access to AP courses, (b) student participation and performance in AP courses, and (c) instructional approaches to improving student performance.

Practice examinations and tutoring are two instructional strategies related to improving student achievement that were identified in the review of the literature. Literature was also reviewed that focused on several science of learning principles, deliberate practice, feedback, and testing effects, as they related to the instructional strategies of practice examinations and tutoring.

The literature review was conducted through searches of the University of Central Florida's online databases, including ERIC, ProQuest, STARRS, Science Direct, Springer Link, Web of Science, Education Source, SAGE Journals, Taylor & Francis, ACM Digital Library, IEEE Digital Library, Cambridge Core, Psych Articles, and Google Scholar. Keywords utilized during research included the following: tutoring, tutorial programs, advanced placement, advanced placement programs, high school students, open access, examination scores, exam scores, student achievement, practice examinations, practice examinations, mock examinations, science of learning, science of learning principles, test effects, testing effects, and feedback effects. To narrow the focus of the literature review, research publications reviewed were restricted to those published between 2008 and 2018. Meta-analyses reviewed were exception to this criterion, as they

may have included research outside of the established timeframe. Additional research was also discovered through examining the references of research publications, dissertations, and collected books.

### Open Access to Advanced Placement

Student enrollment in Advanced Placement (AP) courses and participation in AP examinations increased between 2007 and 2017, both in the United States and in the state of Florida (College Board, 2017). A total of 85% of high school students in the United States attended schools that offered AP courses, and participation continued to rise annually, with 1,464,254 students who took 2,533,431 examinations in 2007 to 2,741,426 students who took 4,957,931 examinations in 2017, an 87% increase over a 10-year period (College Board, 2017). In Florida, the number of AP examinations administered rose from 208,825 in 2007 to 391,250 in 2017, a 51% increase in 10 years (College Board, 2017).

The No Child Left Behind Act (2002) introduced legislation that increased support of state and local efforts to increase participation in AP courses and on AP examinations. Included in the legislation were provisions to increase the number of schools offering AP courses, the number of AP course offerings available, and the participation of ethnically diverse and low-income students in AP courses (NCLB, 2002). Subsequently, the Advanced Placement Test Fee Program (APIP) provided \$28.4 million in grants nationwide to increase participation of low-income students in AP examinations (APIP, 2014). In Florida, the Every Student Succeeds Act (ESSA) of 2015 further addressed state accountability measures and increased the possible contribution of passing AP examinations toward the calculation of school grades (ESSA, 2015). Furthermore, the number of students scoring a three or greater on AP examinations was

calculated into Florida's school college and career readiness measure in the form of acceleration points (FDOE, 2018).

Advocates for the expansion of the AP program cited increased rigor in high school coursework as leading to student advantage in the college admissions process, increased college preparedness, and increased postsecondary enrollment and success (Education Commission of the States, 2016). Flowers (2008) examined the impact of racial differences and participation in AP programs on educational and labor market outcomes using nationally representative data from a longitudinal survey. Results indicated that students who participated in AP programs were more likely to score higher on college entrance examinations, have higher undergraduate grade point averages, earn a post-secondary degree, and earn higher incomes than non-AP students (Flowers, 2008). Jackson, in a 2010 quantitative study, also examined the effects of the AP program implemented in urban schools in Texas and subsequent post-secondary educational and labor market outcomes. Jackson investigated how the Advanced Placement Incentive Program (APIP), which was administered to 11<sup>th</sup>- and 12<sup>th</sup>-grade students, affected student college attendance, sophomore year college persistence, college completion, and student labor market earnings. Results of Jackson's (2010) study indicated that participation in the APIP program led to increased college attendance (4.2%), college persistence (4.3-6.6%), and student labor market outcomes (2.7-3.8%).

Warne, Larson, Anderson and Odasso (2015), however, indicated that it was not participation in AP courses, but the passing of AP examinations, that led to increased academic achievement. These researchers used data from a statewide database, and propensity score matching to examine the effect of participation in AP programs on ACT scores of two cohorts of high school graduates in Utah (Warne et al., 2015). The results



of the study indicated an average increase in ACT composite scores of 2.8-4.1 points for students who participated in AP English, and an average increase in ACT composite score of 1.0-2.7 points for students who participated in AP Calculus overall (Warne et al., 2015). For both AP English and AP Calculus courses for both cohort years, however, the largest differences between groups occurred between students who did and did not pass the AP examinations (Warne et al., 2015). Results indicated that participation in AP English and AP Calculus courses was not beneficial to students who merely enrolled in the courses. Though there were some benefits to students who took the AP examination but did not pass it, it was most beneficial to those students who took and passed the examination (Warne et al., 2015). As a result, the researchers concluded that increasing the number of students taking AP courses had little impact on student achievement, unless the students also took and passed the AP examinations.

#### Practices and Perceptions Regarding Open Access

Although state accountability measures were designed to increase access and participation in AP courses (Rowland & Shircliffe, 2016), student success in AP courses and examinations had been attributed to educator and principal beliefs regarding open access and the importance of the AP program (Bradshaw, 2010; King, 2010; Rowland & Shircliffe, 2016; Wood, 2010). Following is a review of recent research regarding educator and principal practices and perceptions of the AP program.

King (2010) conducted a study to examine AP educators' perceptions and the perceived impact of open access policies of AP courses on non-traditional students in a Pacific Northwest state in the United States. A survey method was used to collect data from AP teachers and school-based counselors in one school district with long-standing open access policies to AP courses (King, 2010). Results indicated that educators agreed

with open access policies for all students as long as the students exhibited high levels of interest. Teachers believed that (a) non-traditional students were not detrimental to AP courses, (b) that non-traditional students were positively impacted by the AP curriculum, and (c) that their expectations for all AP students were the same, regardless of academic background (King, 2010). The majority of educators, however, did not support a mandatory AP requirement for any student population, as they believed intrinsic student motivation to be a determining factor in overall AP success (King, 2010).

Wood (2010) also examined principals' perspectives on student access to AP courses, surveying Chicago principals to measure their personal beliefs and perceptions regarding AP practices at their schools on six constructs: (a) the value of AP coursework, (b) AP course offerings, (c) AP placement policies, (d) attracting students to AP, (e) teacher commitment to AP expansion, and (f) expectation of success for students enrolled in AP courses (Wood, 2010). Data were analyzed to determine if a relationship existed between principals' responses and their schools' AP Equity and Excellence Scores, a College Board® measure reported to high schools, of the percentage of graduating seniors who scored a three or higher on an AP examination during high school (Wood, 2010). The results of Wood's study indicated that as the percentage of low-income and minority students increased the Equity and Excellence scores decreased. These results, however, should not be interpreted to mean that AP courses should not be offered to these students. Rather, support measures need to be put in place to ensure student success (Wood, 2010). Various research constructs were demonstrated to overcome demographic variables on the regression analyses conducted: (a) vertical alignment between courses, (b) having AP teachers also teach non-AP classes, (c) principal belief that there should be

more open access to AP courses, and (d) the expectation of success for all and having practices in place to ensure such success (Wood, 2010).

In their subsequent 2011 study, Hallett and Venegas found that although more opportunities existed for students to participate in AP courses, student performance on AP examinations indicated a lack of quality in AP experience and in college preparedness. These researchers collected interview data from 48 racial minority and low-income, college-bound students from 15 high schools in the Los Angeles, California area, who participated in a college preparatory writing program over the summer. Findings indicated that, given the opportunity, low income and minority students would enroll in AP courses and participate in AP examinations; however, the passing rate (46%) on AP examinations was considered low (Hallett & Venegas, 2011). Additionally, student grades in AP courses ( $M = 4.35$ ) exceeded AP examination grades ( $M = 2.55$ ), and students reported a low-quality AP experience. Student grades, therefore, were not found to be a predictor of subsequent student achievement on AP examinations (Hallett & Venegas, 2011).

Bradshaw (2010) examined the relationship between principals' reports of practices regarding open enrollment in AP courses and student performance results in five central Florida school districts. She examined the following three variables related to principals' attitudes toward their schools' AP programs: (a) access and equity practices, (b) open enrollment practices, and (c) an importance rating of the AP program. The three variables were examined in relation to AP course enrollments and overall school success on AP examinations. Results of Bradshaw's (2010) study indicated that, collectively, all three variables were good predictors of student enrollment in AP courses and examinations ( $F(3, 26) = 4.952, p = .008$ ), and of student outcomes on AP

examinations ( $F(3, 26) = 6.56, p = .002$ ) (Bradshaw, 2010). However, when examined separately, only open enrollment and importance were statistically significant predictors in explaining the percentage of students taking an AP examination.

Examining educators' perspectives on open access to AP classes in Florida, Rowland and Shircliffe (2016) presented a varying teacher perspective on open access to AP courses. School district leaders and principals identified teacher gatekeeping and low parental expectations as barriers to increasing AP enrollment. Rowland and Shircliffe (2016) cited the divergent perspectives of teachers, principals and district leaders as a source of conflict regarding open access to AP courses. Although a shared understanding of reform goals existed between educators and administrators, school district administrators and principals were concerned with overcoming barriers to increasing the number of students enrolling in AP courses and remaining in compliance with state mandates (Rowland & Shircliffe, 2016). Conversely, teachers focused on consequences and problems associated with opening access to AP for all students. Competing interests, such as teacher bonuses based on examination pass rate while district leaders received bonuses for increased student participation, were identified (Rowland & Shircliffe, 2016). Teachers also expressed concern regarding students who were placed into AP courses without consideration of the implementation process, namely student preparedness for college-level coursework and teacher preparedness for teaching AP courses. Rowland and Shircliffe concluded that, though encouraging more students to participate was an important part of increasing equity and access to AP courses, attention should also focus on building a system of supports, before and during high school, to empower students and ensure student success in AP courses and on AP examinations.

## Participation and Performance in Advanced Placement

In an effort to increase rigor in the high school curriculum, leaders and policymakers, both nationally and at the state level, have advocated for expanded access to AP courses (Handwerk, Tognatta, Coley, & Gitomer, 2008). At the time of the present study, there was consensus among educational leaders and policy makers regarding the importance of a rigorous high school curriculum. Still, concerns regarding equity and access to such programs have lingered (College Board, 2018; Handwerk et. al, 2008).

### National

Rapid expansion of the AP program continued nationwide, as evidenced by 2,808,990 students who participated in 5,090,324 AP examinations in 2018 (College Board, 2018). Overall, a national median of 5% of students who attended schools where AP programs were available chose to participate in AP courses (College Board, 2008). Two of the most highly populated examinations were AP U.S. History ( $N = 501,530$ ), and AP World History ( $N = 303,243$ ) (College Board, 2018). Although enrollments in AP courses increased, concerns regarding gaps in equity for minority and low socio-economic status students remained, particularly with respect to Black and Hispanic students (College Board, 2008; Wilson, Slate, Moore, & Barnes, 2014). Nationally, 2.4% of Hispanic students, and 0.5% of African American students took an AP examination in 2003-2004, in contrast to 10.3% of White students (College Board, 2008). According to the College Board (2008), even in schools that have had high overall participation rates, African American students were much less likely to participate in the program by taking an examination than were students in other racial/ethnic groups. Despite efforts to close the participation and achievement gaps for minority students enrolled in AP courses, national participation in AP courses and examinations by Hispanic students ( $N =$

646,220) remained lower than that of White students ( $N = 1,357,537$ ) (College Board, 2018).

Concern also remained regarding equity of access to the AP program for low socio-economic status students (College Board, 2008; Handwerk, Tognatta, & Coley, 2008; Jobs for the Future, 2008; NCEA, 2010). The College Board attempted to increase the number of low-SES students participating in AP courses through the introduction of an AP fee reduction program (College Board, 2008). The program was a College Board initiative which provided AP examination fee reductions to low-SES students, in an attempt to increase participation in AP programs by this traditionally underserved population. As a result, between 2004 and 2009, the number of low-SES students who participated in AP examinations nationwide doubled (College Board, 2008).

#### Florida

In Florida, the number of AP examinations taken has increased yearly over the last 10 years, with 398, 873 examinations taken in 2018 (College Board, 2018). Participation in AP U.S. History ( $N = 34,490$ ) and AP World History ( $N = 31,804$ ) have also increased; however, pass rates for examinations remained low, 45% and 49% respectfully (College Board, 2018).

Overall, AP program participation rates in Florida in 2013 indicated that, although 51% of White students and 59% of Hispanic students participated in at least one AP course, participation rates for African American students (38%) were lower (College Board, 2014). Of the 31,102 African American students who graduated from high school in 2013, only 11,742 had participated in an AP course, and 3,000 (26%) scored a three or higher on the AP examination (College Board, 2014). White and Hispanic students in Florida outperformed African American students, with 22,368 of 37,839 Hispanic

graduates participating in an AP course, and 12,773 (56%) scoring a three or higher on the AP examination. In contrast, 37,030 of 72,478 White graduates participated in an AP course, and 20,792 (56%) scored a three or higher on the AP examination (College Board, 2014). The total number of students in Florida's graduating class of 2013 was not reported by the College Board. However, of the 28,216 low-SES students who participated in a minimum of one AP examination, 12,774 (45%) passed at least one examination (College Board, 2014).

### Effects of Participation

Results have been mixed regarding the effects of participation in AP programs (College Board, 2008; Handwerk, Tognatta, & Coley, 2008; Jobs for the Future, 2008; NCEA, 2010). 2008 College Board findings indicated that low-SES AP students experienced higher retention rates, GPAs, and increased likelihood of attending a four-year college than did non-AP low socio-economic status students, regardless of score on AP examinations. Additionally, findings suggested that exposure to AP courses was a better predictor of college persistence and academic success than parental educational level or grade point average (College Board, 2008; Handwerk et al., 2008; Jobs for the Future, 2008). Additional research (NCEA 2010) indicated that it was not participation in AP courses which resulted in future college success, but success on AP examinations, for which low-SES and minority students had low passing rates.

### Recommendations

Although educational leaders and policy makers alike seemed to agree on the importance of a rigorous curriculum in increasing student achievement and college readiness (Handwerk et al., 2008), data indicated that gaps still existed, both nationwide and in Florida, regarding access and equity to AP programs for all students (College

Board, 2008; Handwerk et al., 2008; Jobs for the Future, 2008; NCEA, 2010). Schools were recommended to broaden their AP programs and create an inclusive AP culture (Handwerk et al., 2008), as well as provide systems of supports to ensure the success of all students once enrolled in AP courses (Wood, 2010). Promoting access to AP programs for all students required that schools and school districts ensured that students were adequately prepared to succeed in AP courses (NCEA, 2010).

The Florida Legislature continued to push for open access to AP courses through financial investment in school districts and schools in the form of incentive funding, providing targeted assistance to schools serving low socio-economic status and minority students (College Board, 2014). To continue improvement in open access, and to close gaps in equity and access for all students, the College Board (2014) recommended: (a) establishing statewide AP participation and performance indicators, (b) setting measurable statewide improvement goals, (c) the use of AP Potential to identify underrepresented students for enrollment in AP courses, (d) increased communication between stakeholders, and (e) increased professional development for AP and pre-AP teachers.

#### Instructional Approaches to Improving Student Performance

Hattie (2009) posited that feedback was one of the most powerful influences on student achievement, particularly when it illuminated what students do and do not understand. Eight science of learning principles were identified by Intentional Futures (2015) that described how students learn. Two of these principles, which were utilized after explicit instruction and the organization of knowledge had occurred, are deliberate practice and feedback (Intentional Futures, 2015). Deliberate practice refers to extensive engagement in relevant practice activities for improving performance, and was a key



attribute that differentiated expert from novice teachers (Hattie, 2009). Feedback should be linked to deliberate practice to improve student performance (Intentional Futures, 2015). Frequent testing, also termed the testing effect, was found to be one form of valuable feedback so long as information gained from testing was used to attend to gaps in learning by modifying instruction (Hattie, 2009). Deliberate practice ( $d = 0.71$ ) and feedback ( $d = 0.73$ ) were two instructional strategies that were found to have significant effect sizes on student learning (Hattie, 2009). The following sections have been devoted to reviewing research relating to the efficacy of practice examinations and tutoring as methods of providing testing, feedback and deliberate practice opportunities to improve student achievement.

### Practice Examinations

Rowland (2014) expressed the belief that the more often students were tested and received feedback regarding what they did and did not know, the greater the probability that they performed well on related summative assessments. According to Intentional Futures (2015), the main purpose of formative evaluations, including practice examinations, was to determine whether students have achieved proficiency on standards or learning goals set prior to instruction. Data yielded from such formative evaluations can then be used to determine where gaps in student learning exist and what information needs to be retaught in order for students to achieve proficiency.

Dotson, Sheldon, and Sherman (2010) confirmed the validity of using practice examinations to improve examination performance, examining the efficacy of using online practice questions and practice examination sessions to improve examination performance in undergraduate students. Results indicated that, across all examinations, students who participated in the practice examination scored an average of 12% higher on

examinations that those who did not ( $t(2) = 8.558, p = 0.013$ ), and the practice examination sessions appeared to be most helpful for the group of students who needed them most--students who did not complete any practice questions. Historically, 60% of students who did not complete practice questions failed the course; however, participation in practice examinations reduced the failure rate to 10% (Dotson et al., 2010).

Rowland's 2014 meta-analysis of the effect of testing versus restudy on retention demonstrated the reliability of the testing effect. Results of Rowland's study indicated that the act of effortful processing, as produced by participating in practice examinations, significantly increased knowledge retention rates ( $z = 12.38, p < .001$ ). The overall mean weighted testing effect was positive ( $g = 0.50, CI [0.42, 0.58]$ ) and significant ( $p < .001$ ), indicating that testing is an effective way to increase rates of knowledge retention (Rowland, 2014, p. 1447).

In 2018, Nip, Gunter, Herman, Morphew, and West (2018) compared the efficacy of computer-based examinations to that of computer-based homework as a method of practice. They found that participation in practice examinations resulted in higher mean final examination scores ( $M = 76.8\%, SD = 15.6\%$ ) than did completing homework ( $M = 72.5\%, SD = 18.6\%$ ). Furthermore, the researchers examined the effect of testing versus homework on pass rates and found that grade distributions were significantly different [ $\chi^2(3) = 10.00, p = .02$ ] between groups, and that the percentage of failing grades from the homework group was proportional to the increase in number of passing grades in the practice examination group (Nip et al., 2018).

Geller et al. (2018), examined the self-reported study strategies of undergraduate college students and their relationship to student achievement. Results indicated that

higher performing students were more likely to engage in self-testing practices than their low-performing counterparts [ $X^2(1) = 17.19$ ,  $\exp(\beta) = 1.33$ ,  $p < .001$ ,  $d = .16$ ] (Geller et al., 2018).

A meta-analysis conducted by Pan and Rickard (2018), extended knowledge regarding the effects of testing by examining the transferability of knowledge learned through testing. A synthesis of over 40 years of data related to testing revealed that testing produces transferrable learning ( $d = 0.40$ , 95% CI [0.31, 0.50]), which can be later retrieved in other contexts, more so than re-exposure to learned information does. Furthermore, transfer of learning was increased when practice examinations and examinations were similar, when the practice examination required knowledge retrieval at varying levels of cognitive processing, and when restudy and feedback were provided (Pan & Rickard, 2018).

### Tutoring

Although little research has been conducted examining the efficacy of beyond-school-day tutoring as an instructional approach to improving AP examination scores, a number of studies were conducted researching the efficacy of tutoring to improve student achievement (Maestre, 2015; Munoz, Potter, & Ross, 2008; Munoz, Chang, & Ross, 2012; Rajadhyax, 2017; Rothman & Henderson, 2011; Zimmer, Hamilton, & Christina, 2010). Additionally, many programs were federally funded, as in the case of Title I schools, so that schools could provide tutoring opportunities to students labeled at risk (ESSA, 2015).

### National

Munoz, Potter, and Ross (2008) examined the impact of tutoring programs and individual service providers on student achievement in reading and mathematics in a

large urban school district in Kentucky. Aggregate data indicated that, although the overall direction of the means slightly favored the treatment group over the control group, the overall program effect was not significant in reading ( $F(1, 1080) = 1.39, p = .24$ ) or mathematics ( $F(1, 911) = .33, p = .57$ ). Additionally, Munoz et al. (2008) examined the impact of various providers to determine if results differed; however, no service provider exhibited a statistically significant impact on student achievement in reading or mathematics.

In a Pennsylvania study examining the efficacy of two tutoring programs, Zimmer, Hamilton, and Christina (2010) analyzed data from the two programs across several statistical models with mixed results. Results for students participating in one program were positive across models for mathematics but not for reading. Results were mixed for both reading and mathematics in the second program across all models. Overall, results from the various models indicated substantive effects for both reading and mathematics for students who participated in the first program and in mathematics for students who participated in both the first and second programs. Results, however, were less consistent in reading and mathematics for students who participated solely in the second program (Zimmer et al., 2010).

Previous research reviewed focused on program efficacy for all students who chose to participate. A subsequent study conducted in New Jersey by Rothman and Henderson (2011) focused on middle school students labeled as borderline in language arts or mathematics, as determined by previous years' standardized test scores on the New Jersey Assessment of Skills and Knowledge (NJASK). Program design differed from previous studies in that (a) teachers were selected to be tutors based on perceived classroom effectiveness, (b) the student-teacher ratio was small (4:1), (c) communication

existed between tutors and classroom teachers in the form of weekly progress reports, and (d) incentives were given to students for perfect attendance. Of the identified students, those who chose to participate in tutoring were provided with two 90-minute sessions of tutoring per week for a total of 48 hours and were taught a curriculum different from that taught during the school day (Rothman & Henderson, 2011). Results of Rothman and Henderson's (2011) study indicated that students who participated in tutoring significantly outperformed the control group in both language arts ( $F(1, 57) = 5.85, p = .02$ ), and mathematics ( $F(1, 54) = 4.55, p = .04$ ). Rothman and Henderson cited several possible factors which may have contributed to the success of the tutoring program in New Jersey: (a) use of district teachers as tutors, (b) communication between tutors and classroom teachers, (c) increased time spent in tutoring, (d) use of attendance incentives, (e) small teacher to student ratio, and (f) positive and caring teacher-student relationships.

Munoz, Chang, and Ross (2012) conducted a follow-up to the 2008 study in Kentucky during the fifth year of program implementation to determine if results generated by the tutoring program improved with program maturity. During the school year, district staff used previously collected program data to work systematically with service providers to improve program quality, better align instruction with accountability measures, and ensure implementation fidelity in an effort to increase program effect on student achievement. Overall program effects were not found to be significant for reading [ $F(1, 683) = 0.41, p = .52$ ] or mathematics [ $F(1, 650) = 1.25, p = .26$ ]. When service providers were analyzed individually, however, results indicated that one in seven providers was associated with statistically significant gains in reading ( $n = 26, M_{pre} = 27.88, M_{post} = 33.54; +.34, t(1, 25) = 2.23, p = .04$ ), and marginally significant gains in

mathematics ( $n = 12$ ,  $M_{pre} = 38.00$ ,  $M_{post} = 44.50$ ;  $+.40$ ,  $t(1, 11) = 1.88$ ,  $p = .09$ ) (Munoz et al., 2012).

### Florida

Maestre (2015) conducted a study examining the relationship between participation in tutoring and student achievement as measured by the FCAT 2.0 Reading, FCAT Reading Annual Growth (DSS), Algebra 1 End-of-Course (EOC), Geometry EOC, Biology EOC, and U.S. History EOC examinations in Florida. All students who received at least one hour of tutoring in any of the content areas were included in the study. Quantitative findings indicated that a statistically significant relationship existed between frequency of participation in tutoring and student achievement on the FCAT Reading Annual Growth ( $r = 0.63$ ,  $n = 157$ ,  $p = 0.00$ ), Algebra 1 EOC ( $r = 0.30$ ,  $n = 146$ ,  $p = 0.00$ ), and Biology EOC ( $r = 0.34$ ,  $n = 143$ ,  $p = 0.00$ ) assessments (Maestre, 2015). There was, however, no statistically significant relationship found between frequency of participation in tutoring and student performance outcomes on the FCAT 2.0 Reading ( $r = .02$ ,  $n = 169$ ,  $p = 0.83$ ), Geometry End-Of-Course ( $r = .02$ ,  $n = 62$ ,  $p = 0.88$ ), or U.S. History End-Of-Course ( $r = -0.49$ ,  $n = 41$ ,  $p = 0.76$ ) assessments (Maestra, 2015). Upon further analysis of tutoring frequency, Maestre discovered that, students who participated in a minimum of 11-15 hours of tutoring for the Algebra 1 EOC, 6-10 hours of tutoring for the Biology EOC, or 11-15 hours of tutoring for the Geometry EOC, and achieved statistically significant increases in examination scores. Results, therefore, indicated a possible minimum number of tutoring hours may be required in order to achieve a significant increase in outcome measures (Maestre, 2015).

A follow-up study in Florida by Rajadhyax (2017), was conducted to examine the relationship between participation in tutoring and change in outcome measures as

assessed by the Florida Standards Assessment (FSA) in Mathematics and English Language Arts (ELA) at the middle school level for the 2014-2015 and 2015-2016 school years. Rajadhyax (2017) found that there was no statistically significant relationship between frequency of participation in tutoring and outcome measures in FSA Mathematics and ELA; however, for each grade level FSA ELA, the mean change for 60% of the ranges was higher for students who participated in tutoring than it was for students who did not. Additionally, sixth-grade FSA Mathematics scores indicated that only students who participated in 20-22 hours of tutoring had a higher mean change than those who did not. Rajadhyax (2017) also examined three varying tutoring models, computer-based, small group, and mixed methods, to determine if the modality of the model had an effect on outcome measures. Results revealed no statistical difference between tutoring modality and outcome measures on the FSA Mathematics and ELA. Although results of Rajadhyax's study showed no statistical significance between participation in tutoring and improved outcome measures, the mean change in outcome measures for all students who participated in tutoring was higher than the mean change for students who did not participate in tutoring and attended the same school.

Several limitations were cited regarding research on various tutoring models, which could have contributed to the variability in findings regarding the efficacy of programs. Munoz et al. (2008) cited the limited duration of tutoring and failure to implement programs with fidelity as possible contributing factors to the lack of program success. Zimmer et al. (2010) indicated that lower performing students were more likely than others to take advantage of tutoring opportunities, which could affect results. Munoz et al. (2012) noted that, although slight improvements in results were observed in the follow-up study, specific program characteristics of the various providers were not

examined. Finally, Rajadhyax (2017) suggested that school leaders needed to focus on strengthening tutoring programs and identifying areas in need of improvement.

### Summary

Because higher enrollment numbers had been shown to also increase the success rate on AP examinations, the College Board (2017) advocated for open enrollment policies in AP programs. Researchers had also indicated that teacher and principal perceptions and practices regarding open enrollment policies in AP courses, did affect student access and equity in AP programs (Bradshaw, 2010; King, 2010; Rowland & Shircliffe, 2016; Wood, 2010).

Although College Board (2017) records indicated that increased numbers of students participated in AP courses in Florida over the years, rates of successful completion of AP examinations for college credit remained low. One key to successful expansion of AP programs suggested by the College Board (2018), was to provide support to students and teachers who participated in the AP program.

Practice examinations and tutoring are two possible ways such support could be provided to students enrolled in AP courses. Numerous researchers have supported practice examinations as an effective method of providing formative evaluation and feedback to students (Dotson et al., 2010; Intentional Futures, 2015; Nip et al., 2018; Pan & Rickard, 2018; Rowland, 2014). Variability of results regarding the efficacy of tutoring, however, suggested that further research is needed to determine optimal structure and design of tutoring programs to improve outcome measures (Maestre, 2015; Munoz et al., 2008; Munoz et al., 2012; Rajadyax, 2017; Rothman & Henderson, 2011; Zimmer et al., 2010). Specifically, the structure of tutoring programs (Rothman & Henderson, 2011), and duration of tutoring interventions (Maestre, 2015; Rajadhyax,



2017), may need to be explored in order to determine how to best provide support to students and improve outcome measures. Furthermore, little research existed regarding the use of practice examinations as a method of formative evaluation, to guide tutoring content, and potentially improve student achievement.

## CHAPTER 3 METHODOLOGY

### Introduction

The purpose of this case study was to determine the relationship between the use of practice examinations, beyond-school-day tutoring, and student achievement on Advanced Placement (AP) U.S. History and AP World History examinations. This chapter describes the methodology utilized, the rationale for the population and sample chosen for this study, data sources and procedures used in collection and analysis of data.

### Design of the Study

A quantitative design was selected using a purposive sample. The instructional approach of using AP practice examinations to inform AP beyond-school-day tutoring was in its first year of implementation at FHS during the 2017-2018 school year, and was the only high school within the school district of study implementing these instructional approaches to support students participating in AP examinations. Causal-comparative and correlational approaches were combined and chosen based on the nature of the research questions (Gay, Mills, & Airasian, 2012).

### Context of the Study

The school district of study was a large Florida school district. School district level leaders sought to increase student participation in AP courses, in order to increase rigor in the high school curriculum for all students (School District of Study, personal communication, August 18, 2017). The AP program, developed and overseen by the College Board, provided a wide range of college level courses that could be taken by students while in high school. These students had the potential to receive college credit if they passed the AP examinations with a score of 3 or better (College Board, 2017). The school district of study was designated, in February 2018, as an AP District Honor Roll

school district by the College Board for demonstrating significant gains in student access and success in AP courses (College Board, 2018).

School district leaders continued efforts to increase equity and access to AP courses and required that all high schools provide access to AP practice examinations for the 2017-2018 school year (School District of Study, personal communication, August 18, 2017). The following sub-sections describe the context of the current study with respect to: a) the school of study (FHS), b) and the demographically matched high school (MHS).

#### High School of Study

Florida High School (FHS), is the pseudonym given to the large urban high school of study which had a population of 2,507 students during the 2017-2018 academic year (School District of Study, personal communication, November 6, 2018).

Demographic data for FHS indicated the student population ( $N = 2507$ ) was racially and ethnically diverse: 3% Asian, 9% White, 10% Black/African American, 76%

Hispanic/Latino, 0% American Indian/Alaska Native, 0% Pacific Islander, and 2%

Multiracial (Director of Research, Evaluation, & Accountability, November 6, 2018).

Additionally, 69.9% of students at FHS during the 2017-2018 academic year were

classified as economically disadvantaged (personal correspondence, Director of

Research, Evaluation, & Accountability, November 6, 2018). FHS offered a choice of 15

AP courses and examinations during the 2017-2018 academic year.

FHS was the only high school in the school district of study that elected to schedule and administer AP practice examinations during the school day, simulating the actual AP examinations for the 2017-2018 academic year. FHS was also the only high school within the school district of study during the 2017-2018 academic year that

elected to provide targeted tutoring opportunities following the AP practice examinations, thus providing the opportunity for students to address gaps in learning based on AP practice examination results. Students enrolled in AP U.S. History and AP World History at FHS participated in AP practice examinations during the first week of April 2018. Practice examinations were retrieved from the College Board website and administered by AP course teachers in the school resource center. Administration of practice examinations was completed in one session to simulate the procedures for AP examination administration. Immediately following the practice examination, students had the opportunity to provide anonymous feedback to teachers in the form of blank, free-response feedback forms. The feedback's purpose was to provide teachers with information regarding areas in which students struggled or thought they needed more instruction. Practice examinations were collected and scored by teachers, and results were shared with students in class.

Each AP teacher received 18 hours of paid tutoring time following the AP practice examinations to provide AP beyond-school-day tutoring sessions to prepare students for the AP examinations. AP beyond-school-day tutoring sessions took place after the school day or on Saturdays, and student participation was voluntary.

#### Matched High School (MHS)

MHS demographic data indicated that the student population ( $N = 2838$ ) was also racially and ethnically diverse: 2% Asian, 12% White, 13% Black/African American, 71% Hispanic/Latino, 0% American Indian or Alaska Native, 0% Pacific Islander, and 2% Multiracial (personal correspondence, Director of Research, Evaluation, & Accountability, November 6, 2018). Additionally, 69.9% of students were classified as economically disadvantaged (personal correspondence, Director of Research, Evaluation,

& Accountability, November 6, 2018). MHS offered AP practice examinations during the 2017-2018 academic year; however the examinations were either segmented and offered during class time or were offered on Saturdays outside of regular school hours. MHS also offered 30-minute sessions of support instruction every Thursday within the school day, however formalized AP beyond-school day tutoring was not offered during the 2017-2018 academic year.

### Research Questions

The following research questions were used to guide the design of the study:

1. What differences exist between AP U.S. History and AP World History examination scores of students who did and did not participate in AP U.S. History and AP World History practice examinations at one urban Florida high school during the 2017-2018 school year?
2. How do AP examination scores of students who participated in AP beyond-school-day tutoring program compare to AP examination scores of students who did not participate in AP beyond-school-day tutoring, for AP U.S. History and AP World History, at one urban Florida high school during the 2017-2018 school year?
3. What is the relationship between the frequency of student participation in AP beyond-school-day tutoring and AP U.S. History and AP World History examination scores in one urban Florida high school, during the 2017-2018 school year?
4. How do AP U.S. History and AP World History examination scores compare for the urban Florida high school to be studied (FHS) and a demographically

matched high school (MHS) that did not implement AP beyond-school-day tutoring, in one urban Florida school district?

5. How do AP U.S. History and AP World History examination results for the 2017-2018 school year compare to AP U.S. History and AP World History examination results from the 2016-2017 school year, prior to implementation of AP practice examinations and AP beyond-school-day tutoring for the same urban Florida high school?

#### Population

The population for the current study consisted of 16,801 students, in one urban Florida school district. Students were enrolled in one of seven comprehensive high schools, during the 2017-2018 school year.

#### Sample

The purposive sample for this study consisted of 479 high school students who were enrolled in AP U.S. History and AP World History courses at FHS and MHS, and participated in the subsequent AP U.S. History and AP World History examinations, during the 2017-2018 school year. The 2017-2018 academic year was the first year of implementation of full-length AP practice examinations administered during the school day and the first year of implementation of AP beyond-school-day tutoring. AP U.S. History and AP World History were chosen as the focus of the current study due to the courses having the highest AP enrollment numbers at FHS.

The demographic match of FHS and MHS was based on student ethnicity, economic status, and percentage of English learners (ELs) of each respective school populations. Both FHS and MHS were designated as Title I schools, as 71% or more of the school populations were economically disadvantaged and received free or reduced

lunch (ESSA, 2015). A variation to be noted between the schools was that FHS included an International Baccalaureate (IB) program; however, students enrolled in the IB program did not participate in AP U.S. History or AP World History courses.

### Instrumentation

AP curricula and examinations were developed by College Board, utilizing committees comprised of college faculty members and AP teachers, to ensure that curricula and examinations were comparable to college level courses and expectations (College Board, 2017). Free-response questions on AP examinations were scored by college faculty members, and expert AP teachers, and multiple-choice questions were scored by machine. Weighted scores, for multiple-choice and free-response sections, were combined to generate a composite score. The composite score was then converted to an AP examination score ranging from one to five; a score of three or higher was considered successful completion for possible college credit (College Board, 2017).

Research by College Board (2013) has established the validity of using passing AP examination scores, by scoring a three or greater on a five-point scale, for college credit in a comparable college course. The researchers first identified introductory college course equivalents for all AP courses, identified subsequent college courses, and used propensity score matching for AP and non-AP course participants. Results indicated that AP students either outperformed or performed comparably to non-AP students on subsequent college courses across all subject areas (College Board, 2013). The reliability of AP examinations was assessed by Reshetar and Melican (2010) who found AP examinations to internally consistent with reliability estimates which ranged from .85 - .94 across AP examination subjects.

Attendance data for beyond-school-day tutoring were collected daily by a school-based administrator at Florida High School (FHS) in the form of a Google® document. Practice examination attendance was recorded by teachers on the day of the examination and submitted to a school-based administrator at FHS following the practice examination administration.

### Data Collection

This case study utilized a quantitative approach to collect and analyze all relevant data. Archival attendance records for students who participated in AP U.S. History and AP World History practice examinations and AP U.S. History and AP World History beyond-school-day tutoring during the 2017-2018 academic year were obtained from the FHS administration. The data were aggregated into an Excel spreadsheet and sent to the Director of Research, Evaluation, and Accountability, at the school district of study where AP U.S. History and AP World History examination scores for students at FHS and MHS were kept for the 2017-2018 academic year. Data were then de-identified to protect student confidentiality and returned to the researcher. De-identified AP U.S. History and AP World History examination scores for students at FHS for the 2016-2017 academic year were also obtained from the school district of study.

### University Protocol

An application to the University of Central Florida's Institutional Review Board was submitted, on July 16, 2018, outlining the parameters of the intended research. As shown in Appendix A, study approval and permission to collect data were received from the Institutional Review Board on August 4, 2018.



## Large Urban School District Protocol

Upon receiving approval to collect data from the Institutional Review Board from the University of Central Florida, an application was submitted to the Research, Evaluation, and Accountability Department of the Florida school district of study on August 22, 2018. As shown in Appendix B, approval from the school district of study was received on August 28, 2018. Per the school district of study, consent was also required from the principal at the Matched High School (MHS) to use data from the school in the proposed study. Consent was requested from the principal at MHS, by email, on August 23, 2018 and received via return email on October 1, 2018 (attached as Appendix C).

### Data Analysis

AP U.S. History and AP World History examination scores for the 2017 and 2018 examination administrations at FHS were entered in SPSS. AP U.S. History and AP World History examination scores for the Matched High School (MHS) were also entered into SPSS. Data were analyzed in SPSS to answer the five research questions.

#### Data Analysis for Research Question 1

Research Question 1: What differences exist between AP U.S. History and AP World History examination scores of students who did and did not participate in AP U.S. History and AP World History practice examinations at one urban Florida high school during the 2017-2018 school year?

AP practice examination attendance data, submitted by AP U.S. History and AP World History teachers following the administration of the AP practice examinations, were collected from the administration at FHS in September 2018. AP practice examination attendance data were sent to the school district of study to be aggregated

with AP U.S. History and AP World History examination scores. In order to maintain anonymity and protect the confidentiality of students, the data were de-identified by the target school district before being returned to the researcher. An independent samples t-test was conducted to determine if differences existed in AP U.S. History and AP World History examination scores of students who did and who did not participate in AP U.S. History and AP World History practice examinations. Results were reported at a probability level of  $p < .05$ .

#### Data Analysis for Research Question 2

Research Question 2: How do AP examination scores of students who participated in AP beyond-school-day tutoring program compare to AP examination scores of students who did not participate in AP beyond-school-day tutoring for AP U.S. History and AP World History at one urban Florida high school during the 2017-2018 school year?

AP beyond-school-day tutoring attendance data were collected from school administrators at FHS in the form of electronic Google documents which had been submitted by AP U.S. History and AP World History teachers. AP U.S. History and AP World History attendance data were aggregated into an Excel spreadsheet and sent to the school district of study. The school district of study aggregated beyond-school-day tutoring attendance data with AP U.S. History and AP World History examination scores. These data were then de-identified, to protect student confidentiality, prior to being returned to the researcher. An independent samples t-test was conducted to determine if differences existed in AP U.S. History and AP World History examination scores of students who did and did not participate in AP beyond-school-day tutoring. Results were reported at a probability level of  $p < .05$ .

### Data Analysis for Research Question 3

Research Question 3: What is the relationship between the frequency of student participation in AP beyond-school-day tutoring and AP U.S. History and AP World History examination scores in one urban Florida high school during the 2017-2018 school year?

AP beyond-school-day tutoring attendance data were collected from school leaders at FHS in the form of electronic Google documents which had been submitted by AP U.S. History and AP World History teachers. Attendance data were aggregated by the researcher and sent to the school district of study. School district personnel matched attendance data to student AP examination score data. These data were de-identified to protect student confidentiality before they were returned to the researcher. A Pearson Correlation was utilized to determine if a relationship existed between frequency of AP beyond-school-day tutoring participation and AP U.S. History and AP World History examination scores.

### Data Analysis for Research Question 4

Research Question 4: How do AP U.S. History and AP World History examination scores compare for the urban Florida high school to be studied (FHS) and a demographically matched high school (MHS) that did not implement AP beyond-school-day tutoring, in one urban Florida school district?

De-identified AP U.S. History and AP World History examination scores for the 2017-2018 examination administration were collected for FHS and MHS from the school district of study. An independent samples t-test was conducted to compare AP U.S. History and AP World History examination scores of students at FHS and MHS, where beyond-school-day tutoring was and was not offered, respectively.

## Data Analysis for Research Question 5

Research Question 5: How do AP U.S. History and AP World History examination results for the 2017-2018 school year compare to AP U.S. History and AP World History examination results from the 2016-2017 school year, prior to implementation of AP practice examinations and AP beyond-school-day tutoring for the same urban Florida high school?

De-identified AP U.S. History and AP World History examination scores for students at FHS were collected from the school of study for the 2016-2017 and 2017-2018 administrations. An independent samples t-test was conducted to determine if differences existed between AP U.S. History and AP World History examination scores of students before and after implementation of the instructional strategies of AP practice examinations and AP beyond-school-day tutoring at FHS.

Table 5

*Research Questions, Data Sources, Variables, and Data Analysis Methods*

Research Question	Data Sources	Variables	Analysis
1. What differences exist between AP U.S. History and AP World History examination scores of students who did and did not participate in AP U.S. History and AP World History practice examinations at one urban Florida high school during the 2017-2018 school year?	2018 AP Practice Exam Attendance (FHS) 2018 AP Exam Scores (FHS)	Independent: AP Practice Exam Participation Dependent: AP U.S. History & AP World History Exam Scores	Independent samples t-test
2. How do AP examination scores of students who participated in AP beyond-school-day tutoring program compare to AP examination scores of students who did not participate in AP beyond-school-day tutoring for AP U.S. History and AP World History at one urban Florida high school during the 2017-2018 school year?	2018 AP Tutoring Attendance (FHS) 2018 AP Exam Scores (FHS)	Independent: AP Tutoring Attendance Dependent: AP U.S. History & AP World History Exam Scores	Independent samples t-test
3. What is the relationship between the frequency of student participation in AP beyond-school-day tutoring and AP U.S. History and AP World History examination scores in one urban Florida high school, during the 2017-2018 school year?	2018 AP Tutoring Attendance (FHS) 2018 AP Exam Scores (FHS)	Independent: AP Tutoring Attendance Dependent: AP U.S. History & AP World History Exam Scores	Pearson Correlation
4. How do AP U.S. History and AP World History examination results compare for the urban Florida high school to be studied (FHS) and a demographically matched high school (MHS) that did not implement AP beyond-school-day tutoring, in one urban Florida school district?	2018 AP Exam Scores (FHS & MHS)	Independent: School (FHS & MHS) Dependent: AP Exam Scores	Independent samples t-test
5. How do AP U.S. History and AP World History examination results for the 2017-2018 school year compare to AP U.S. History and AP World History examination results from the 2016-2017 school year, prior to implementation of AP practice examinations and AP beyond-school-day tutoring for the same urban Florida high school?	2017 & 2018 AP U.S. History & AP World History Examination Scores for FHS	Independent: Year of Test Results (2017 or 2018) Dependent: AP Exam Scores	Independent samples t-test

## Summary

The population and sample of the present study were identified, and the methods and procedures used to conduct this quantitative study were described in this chapter. Data gathered included AP practice examination attendance data and AP beyond-school-day tutoring attendance data from FHS, AP U.S. History and AP World History examination scores from FHS for 2017 and 2018, and AP U.S. History and AP World History examination scores from MHS for 2018. Statistical measures used to analyze the data and respond to the five research questions which guided the study were also identified, and the statistical tests and data sources utilized in the analysis were described. The results of the statistical tests addressing the five research questions are detailed in Chapter 4.

## CHAPTER 4 RESULTS

### Introduction

The purpose of this study was to determine if Advanced Placement (AP) practice examinations and AP beyond-school-day tutoring were effective approaches to improving student performance on AP U.S. History and AP World History examinations. Because the instructional approaches were implemented in one school within the school district of study, a purposive sample was used. Data collected included practice examination participation data, beyond-school-day tutoring attendance data, and AP U.S. History and AP World History examination scores for students enrolled in AP U.S. History and AP World History at the school of study (FHS) and the matched high school (MHS).

### Research Question 1

What differences exist between AP U.S. History and AP World History examination scores of students who did and did not participate in AP U.S. History and AP World History practice examinations at one urban Florida high school during the 2017-2018 school year?

### AP U.S. History

#### Participation

A total 184 students at FHS participated in the AP U.S. History examination during the 2017-2018 academic year. Of the students who participated, 179 students participated in AP U.S. History practice examinations and five students did not participate. Participation by student subgroup indicated that all 13 Asian students who participated in the AP U.S. History examination also participated in the AP U.S. History practice examination. Similarly, all 23 Black students who participated in the AP U.S.

History examination participated in the AP U.S. History practice examination. Of the 113 Hispanic students who participated in the AP U.S. History examination, 109 students participated in the AP U.S. History practice examination and four students did not participate. All four Mixed Race students who participated in the AP U.S. History examination also participated in the AP U.S. History practice examination. Finally, of the 28 White students who participated in the AP U.S. History examination, 27 students participated in the AP U.S. History practice examination and one student did not participate.

Mean Scores

A total of 184 students at FHS participated in the AP U.S. History examination during the 2017-2018 academic year. The mean score of students who participated in AP U.S. History practice examinations ( $M_{Exam} = 1.84$ ) was higher than the mean AP U.S. History examination score of students who did not participate in AP U.S. History practice examinations ( $M_{NoExam} = 1.40$ ). Overall mean scores and participation rates are displayed in Table 6.

Table 6

*Participation and Mean Advanced Placement (AP) U.S. History Examination Scores at FHS for the 2017-2018 Academic Year (N = 184)*

Practice Examination	<i>n</i>	FHS ( <i>N</i> = 184) Mean Score	<i>SD</i>
Yes	179	1.84	1.016
No	5	1.40	0.894



Mean AP U.S. History examination scores by student subgroups indicated that American Indian students ( $M = 2.33$ ) scored higher on the AP U.S. History examination than did White ( $M = 2.30$ ), Asian ( $M = 2.08$ ), Black ( $M = 2.00$ ), Mixed Race ( $M = 1.75$ ) and Hispanic ( $M = 1.66$ ) students. All Asian students at FHS during the 2017-2018 academic year participated in AP practice examinations ( $M_{\text{Exam}} = 2.08$ ). Similarly, all Black students at FHS participated in AP practice examinations ( $M_{\text{Exam}} = 2.00$ ). Hispanic students at FHS during the 2017-2018 academic year who participated in AP practice examinations ( $M_{\text{Exam}} = 1.66$ ) had a higher mean score on the AP U.S. History examination than the score of the Hispanic student who did not participate in the AP practice examination and scored a one out of a possible five-points. American Indian students at FHS during the 2017-2018 academic year who participated in AP practice examinations ( $M_{\text{Exam}} = 2.33$ ) had a higher mean score on the AP U.S. History examination than the score of the one American Indian student who did not participate in the AP practice examination and scored a two on a five-point scale. All Mixed Race students at FHS participated in AP practice examinations ( $M_{\text{Exam}} = 1.75$ ). Finally, White students at FHS who participated in AP practice examinations for the 2017-2018 academic year ( $M_{\text{Exam}} = 2.30$ ) had a higher mean score on the AP U.S. History examination than the score of the one White student who did not participate in the AP practice examination and scored a one on a five-point scale. Descriptive statistics by student subgroup of students who did and did not participate in AP U.S. History practice examinations at FHS are presented in Table 7.

Table 7

*Participation and Mean Scores in Advanced Placement (AP) U.S. History Practice Examinations at Florida High School (FHS) by Student Subgroup (N = 184)*

Race	<i>n</i>	Participated ( <i>n</i> = 179)		Did Not Participate ( <i>n</i> = 5)		
		Mean Score	<i>SD</i>	<i>n</i>	Mean Score	<i>SD</i>
Asian	13	2.08	1.320	--	--	--
Black	23	2.00	1.087	--	--	--
Hispanic	109	1.66	.841	4	1.00	--
American Indian	3	2.33	1.155	--	--	--
Mixed Race	4	1.75	.957	--	--	--
Pacific Islander	--	--	--	--	--	--
White	27	2.30	1.295	1	3.00	--

Economically Disadvantaged

The total number of students at FHS during the 2017-2018 academic year who participated in the AP U.S. History examination was 184. Of the total number of students at FHS who participated in the AP U.S. History examination for the 2017-2018 academic year, 97 students were identified as economically disadvantaged and 86 students were identified as not economically disadvantaged. Of the 97 students who were identified as economically disadvantaged for the 2017-2018 academic year, 92 students participated in the AP U.S. History practice examination and five students did not participate. All 86 students who did not identify as economically disadvantaged participated in the AP U.S. History practice examination.

The mean AP U.S. History examination score of students identified as economically disadvantaged ( $M = 1.83$ ) was slightly lower than the mean score of students not identified as economically disadvantaged ( $M = 1.86$ ). Economically disadvantaged students at FHS who participated in AP practice examinations during the 2017-2018 academic year had a higher mean score on the AP U.S. History examination than economically disadvantaged students who did not participate in AP practice examinations ( $M_{\text{Exam}} = 1.83$ ,  $M_{\text{NoExam}} = 1.40$ ). All students who did not identify as economically disadvantaged at FHS participated in AP U.S. History practice examinations during the 2017-2018 academic year ( $M_{\text{Exam}} = 1.86$ ). Descriptive statistics by economic status for students who did and did not participate in AP U.S. History practice examinations at FHS are presented in Table 8.

Table 8

*Participation and Mean Scores in Advanced Placement (AP) U.S. History Practice Examinations at Florida High School (FHS) by Economic Status (N = 183)*

Economically Disadvantaged	Participated ( $n = 178$ )			Did Not Participate ( $n = 5$ )		
	$n$	Mean Scores	$SD$	$n$	Mean Scores	$SD$
Yes	92	1.83	1.034	5	1.40	0.894
No	86	1.86	1.008	--	--	--

### AP World History

#### Participation

The total of 122 students participated in the AP World History examination at FHS during the 2017-2018 academic year. Of the students who participated in the AP World History examination during the 2017-2018 academic year, 118 students

participated in the AP World History practice examination and four students did not participate. Participation by student subgroup indicated that all four of the Asian students who participated in the AP World History examination also participated in the AP World History practice examination. Of the 12 Black students who participated in the AP World History examination, 11 students participated in the AP World History practice examination and one student did not participate. Of the 90 Hispanic students who participated in the AP World History examination, 89 students participated in the AP World History practice examination and one student did not participate. All Mixed Race students ( $n = 2$ ) who participated in the AP World History examination also participated in the AP World History practice examination. Finally, of the 13 White students who participated in the AP World History examination, 12 students participated in the AP World History practice examination and one student did not participate.

### Mean Scores

A total of 122 students at FHS participated in the AP World History examination during the 2017-2018 academic year. The mean AP World History examination score for students who participated in AP practice examinations was higher than the mean AP World History examination score of students who did not participate in AP practice examinations ( $M_{\text{Exam}} = 1.88$ ,  $M_{\text{NoExam}} = 1.25$ ). Overall mean AP World History examination scores for FHS for the 2017-2018 academic year are displayed in Table 9.

Table 9

*Participation and Mean Advanced Placement (AP) World History Examination Scores at FHS for the 2017-2018 Academic Year (N = 122)*

Practice Examination	<i>n</i>	FHS (N = 122) Mean Score	<i>SD</i>
Yes	118	1.88	0.083
No	4	1.25	0.250

Mean AP World History examination scores by subgroup who participated in AP practice examinations indicated that Asian students ( $M = 2.75$ ) scored higher on the AP World History examination than did White ( $M = 2.17$ ), Black ( $M = 1.82$ ), Hispanic ( $M = 1.82$ ) and Mixed Race ( $M = 1.50$ ) students. All Asian students at FHS participated in AP World History practice examinations during the 2017-2018 academic year ( $M_{\text{Exam}} = 2.75$ ). Black students at FHS who participated in AP World History practice examinations had a higher mean score on the AP World History examination than the one Black student who did not participate in the AP World History practice examination ( $M_{\text{Exam}} = 1.82$ ,  $M_{\text{NoExam}} = 1.00$ ). Hispanic students at FHS who participated in the AP World History practice examination for the 2017-2018 academic year had a higher mean score on the AP World History examination than the one Hispanic student who did not participate in the AP practice examination ( $M_{\text{Exam}} = 1.82$ ,  $M_{\text{NoExam}} = 1.00$ ). One American Indian student at FHS participated in the AP World History examination but did not attend the AP World History practice examination for the 2017-2018 academic year and scored a two on a five-point scale. The two Mixed Race students at FHS who participated in AP World History examination both participated in the AP World History practice examination ( $M_{\text{Exam}} = 1.50$ ). Finally, White students at FHS who participated in

AP practice examinations for the 2017-2018 academic year had a higher mean score on the AP World History examination than the score of the one White student who did not participate in the AP practice examination ( $M_{\text{Exam}} = 2.17, M_{\text{NoExam}} = 1.00$ ). Descriptive data by subgroup for students who did and did not participate in AP World History practice examinations at FHS are displayed in Table 10.

Table 10

*Participation and Mean Scores in Advanced Placement (AP) World History Practice Examinations at Florida High School (FHS) by Student Subgroups (N = 122)*

Race	n	Participated (n = 118)		Did Not Participate (n = 4)		
		Mean Score	SD	n	Mean Score	SD
Asian	4	2.75	.957	--	--	--
Black	11	1.82	.751	1	1.00	--
Hispanic	89	1.82	.860	1	1.00	--
American Indian	--	--	--	1	2.00	--
Mixed Race	2	1.50	.707	--	--	--
Pacific Islander	--	--	--	--	--	--
White	12	2.17	1.193	1	1.00	--

#### Economically Disadvantaged

A total of 122 students at FHS during the 2017-2018 academic year participated in the AP World History examination, of which 69 were identified as economically disadvantaged and 53 were identified as not economically disadvantaged. Of the 69 economically disadvantaged students who participated in the AP World History examination, 67 participated in the AP U.S. History practice examination and two

students did not participate. Of the 53 students who were identified as not economically disadvantaged, 51 participated in the AP World History practice examination and two students did not participate.

The mean AP World History examination score of students who participated in AP practice examinations and were identified as economically disadvantaged was slightly higher than the mean of students who participated in AP practice examinations and were not identified as economically disadvantaged ( $M_{\text{Exam}} = 1.91$ ,  $M_{\text{NoExam}} = 1.84$ ).

Economically disadvantaged students at FHS who participated in AP practice examinations during the 2017-2018 academic year had a higher mean score on the AP World History examination than economically disadvantaged students who did not participate in AP practice examinations ( $M_{\text{Exam}} = 1.91$ ,  $M_{\text{NoExam}} = 1.00$ ). Students who did not identify as economically disadvantaged at FHS and who participated in AP World History practice examinations during the 2017-2018 academic year had a higher mean score on the AP World History examination than those who did not participate in AP World History practice examinations ( $M_{\text{Exam}} = 1.84$ ,  $M_{\text{NoExam}} = 1.50$ ). Descriptive data by economic status for students who did and did not participate in AP World History practice examinations at FHS are displayed in Table 11.

Table 11

*Participation and Mean Scores in Advanced Placement (AP) World History Practice Examinations at Florida High School (FHS) by Economic Status (N = 122)*

Economically Disadvantaged	Participated (n = 118)			Did Not Participate (n = 4)		
	n	Mean Score	SD	n	Mean Score	SD
Yes	67	1.91	0.933	2	1.00	--
No	51	1.84	0.857	2	1.50	0.707

Statistical Analysis: AP U.S. History and AP World History

The researcher intended to conduct an independent samples t-test to answer research question one to determine if a significant difference existed between mean AP U.S. History and AP World History examination scores of students who did and who did not participate in AP practice examinations. Due to small sample sizes of students at FHS who did not participate in AP practice examinations for AP U.S. History ( $n = 5$ ) and AP World History ( $n = 4$ ), a statistical test was not conducted for this research question. Sample sizes of students who did not participate in the AP practice examinations were too small for a normal distribution of data (Gay, Mills, & Airasian, 2012), making a comparison of means inconclusive.

Research Question 2

How do AP examination scores of students who participated in AP beyond-school-day tutoring program compare to AP examination scores of students who did not participate in AP beyond-school-day tutoring for AP U.S. History and AP World History at one urban Florida high school during the 2017-2018 school year.



## AP U.S. History

### Participation

A total of 184 students participated in the AP U.S. History examination at FHS during the 2017-2018 academic year. Of those who participated in the AP U.S. History examination at FHS for the 2017-2018 academic year, 119 students chose to participate in AP U.S. History beyond-school-day tutoring and 65 chose not to participate.

Participation by student subgroup indicated that, of the 13 Asian students who participated in the AP U.S. History examination, 10 Asian students chose to participate in AP U.S. History beyond-school-day tutoring and three Asian students chose not to participate. Of the 23 Black students who participated in the AP U.S. History examination, 18 chose to participate in AP U.S. History beyond-school-day tutoring and five chose not to participate. Of the 113 Hispanic students who participated in the AP U.S. History examination, 70 Hispanic students chose to participate in AP U.S. History beyond-school-day tutoring and 43 Hispanic students chose not to participate. Of the three American Indian students who participated in the AP U.S. History examination, two American Indian students chose to participate in AP U.S. History beyond-school-day tutoring and one American Indian student chose not to participate. Of the four Mixed Race students who participated in the AP U.S. History examination, three Mixed Race students chose to participate in AP U.S. History beyond-school-day tutoring and one Mixed Race student chose not to participate. Finally, of the 28 White students who participated in the AP U.S. History examination, 16 White students chose to participate in AP U.S. History beyond-school-day tutoring and 12 White students chose not to participate.

### Mean Scores

The mean AP U.S. History examination score of students who participated in AP beyond-school-day tutoring was 1.87 on a five-point scale with a standard deviation of 1.049. The mean AP U.S. History examination score of students who did not participate in AP beyond-school-day tutoring was 1.77 on a five-point scale with a standard deviation of 0.948. Participation and mean AP U.S. History examination scores are displayed in Table 12.

Table 12

*Mean Advanced Placement (AP) U.S. History Examination Scores at FHS for the 2017-2018 Academic Year by Tutoring Attendance (N = 184)*

Attended	<i>n</i>	Mean Score	<i>SD</i>
Yes	119	1.87	1.049
No	65	1.77	0.948

Mean AP U.S. History examination scores of students who participated in AP beyond-school-day tutoring by subgroup indicated that American Indian students ( $M = 3.00$ ) scored higher on the AP U.S. History examination than White ( $M = 2.50$ ), Asian ( $M = 2.20$ ), Black ( $M = 1.94$ ), Hispanic ( $M = 1.63$ ), or Mixed race ( $M = 1.67$ ) students. Asian students at FHS who participated in tutoring during the 2017-2018 academic year had a higher mean score on the AP U.S. History examination than Asian students who did not participate in tutoring ( $M_{\text{Tutoring}} = 2.20$ ,  $M_{\text{NoTutoring}} = 1.67$ ). Black students at FHS who participated in tutoring had a lower mean score on the AP U.S. History examination than Black students who did not participate in tutoring ( $M_{\text{Tutoring}} = 1.94$ ,  $M_{\text{NoTutoring}} = 2.20$ ). Hispanic students at FHS who participated in tutoring for the 2017-2018 academic

year had a lower mean score on the AP U.S. History examination than Hispanic students who did not participate in tutoring ( $M_{\text{Tutoring}} = 1.63, M_{\text{NoTutoring}} = 1.65$ ). American Indian students at FHS who participated in tutoring for the 2017-2018 academic year had a mean score of 3.00 on the AP U.S. History examination while the score of the one American Indian student who did not participate in tutoring was a one on a five-point scale. Mixed Race students at FHS who participated in tutoring for the 2017-2018 academic year had a mean score of 1.67 on the AP U.S. History examination while the one Mixed Race student who did not participate in tutoring scored a two on a five-point scale. Finally, White students at FHS who participated in tutoring for the 2017-2018 academic year had a higher mean score on the AP U.S. History examination than White students who did not participate in tutoring, ( $M_{\text{Tutoring}} = 2.50, M_{\text{NoTutoring}} = 2.08$ ). Descriptive data by subgroup for students who did and did not participate in AP U.S. History beyond-school-day tutoring at FHS are displayed in Table 13.

Table 13

*Participation in AP U.S. History Beyond-school-day Tutoring and Mean AP U.S. History Examination Score by Race (N = 184)*

Race	Participated (n = 119)			Did Not Participate (n = 65)		
	n	Mean Score	SD	n	Mean Score	SD
Asian	10	2.20	1.398	3	1.67	1.155
Black	18	1.94	1.110	5	2.20	1.095
Hispanic	70	1.63	.820	43	1.65	.870
American Indian	2	3.00	--	1	1.00	--
Mixed Race	3	1.67	1.155	1	2.00	--
Pacific Islander	--	--	--	--	--	--
White	16	2.50	1.366	12	2.08	1.165

#### Economically Disadvantaged

The total of 184 students at FHS during the 2017-2018 academic year participated in the AP U.S. History examination was, of which 97 were identified as economically disadvantaged, 86 were identified as not economically disadvantaged, and one student had no economic status designation. Of the 97 students who were identified as economically disadvantaged, 57 chose to participate in AP U.S. History beyond-school-day tutoring and 40 chose not to participate. Of the 86 students who were identified as not economically disadvantaged, 61 chose to participate in AP U.S. History beyond-school-day tutoring and 25 chose not to participate.

The mean AP U.S. History examination score of economically disadvantaged students who participated in AP U.S. History beyond-school-day tutoring was slightly lower than the mean AP U.S. History examination score of students who were identified

as not economically disadvantaged who participated in AP U.S. History beyond-school-day tutoring ( $M_{\text{EconDis}} = 1.84$ ,  $M_{\text{NotEconDis}} = 1.89$ ). Economically disadvantaged students at FHS who participated in AP beyond-school-day tutoring during the 2017-2018 academic year had a higher mean score on the AP U.S. History examination than economically disadvantaged students who did not participate in AP beyond-school-day tutoring ( $M_{\text{Tutoring}} = 1.84$ ,  $M_{\text{NoTutoring}} = 1.75$ ). Students who did not identify as economically disadvantaged at FHS and who participated in AP beyond-school-day tutoring during the 2017-2018 academic year had a higher mean score on the AP U.S. History examination than students who did not participate in AP beyond-school-day tutoring ( $M_{\text{Tutoring}} = 1.89$ ,  $M_{\text{NoTutoring}} = 1.80$ ). Descriptive data by economic status for students who did and did not participate in AP U.S. History beyond-school-day tutoring at FHS are displayed in Table 14.

Table 14

*Participation in Advanced Placement (AP) U.S. History Beyond-school-day Tutoring and Mean AP U.S. History Examination Score by Economic Status (N = 184)*

Economically Disadvantaged	Participated (n = 118)			Did Not Participate (n = 65)		
	n	Mean Score	SD	n	Mean Score	SD
Yes	57	1.84	1.066	40	1.75	0.981
No	61	1.89	1.050	25	1.80	0.913

#### Statistical Analysis

An independent samples t-test was utilized to determine what differences, if any, existed between AP U.S. History examination scores of students who did and who did not participate in AP beyond-school-day tutoring. The independent samples t-test was conducted to determine if statistically significant differences existed between mean AP

U.S. History examination scores of students who did and who did not participate in AP beyond-school-day tutoring. The statistical analyses were conducted with a selected probability level of  $p = 0.05$ .

The difference between the mean score for students who participated in AP beyond-school-day tutoring ( $M = 1.77$ ) and the mean score for students who did not participate in AP beyond-school-day tutoring ( $M = 1.87$ ) was not statistically significant for AP U.S. History at the  $p < .05$  level [ $t(182) = -.615, p = .539$ ]. Results of the independent samples t-test comparing the mean scores of students who did and who did not participate in AP U.S. History beyond-school-day tutoring are displayed in Table 15.

Table 15

*Independent Samples t-test: Mean A.P. U.S. History Examination Scores for Tutored Students vs. Non-tutored Students (N = 184)*

Variables	Levene's Test		t	df	t-test for Equality of Means			95% CI	
	F	Sig.			Sig. (2-tailed)	Mean Difference	Std. Error Difference	LL	UL
AP U.S. History	.269	.605	6.150	182	.539	-0.96	.156	-.405	.212

### AP World History

#### Participation

A total of 122 students participated in the AP World History examination at FHS for the 2017-2018 academic year. Of those who participated in the AP World History examination, 73 students chose to participate in AP World History beyond-school-day tutoring and 49 chose not to participate. Participation by student subgroup indicated that of the 12 Asian students who participated in the AP World History examination, three Asian students chose to participate in AP World History beyond-school-day tutoring and nine Asian students chose not to participate. Of the 22 Black students who participated in

the AP World History examination, nine Black students chose to participate in AP World History beyond-school-day tutoring and 13 Black students chose not to participate. Of the 159 Hispanic students who participate in the AP World History examination, 54 Hispanic students chose to participate in AP World History beyond-school-day tutoring and 105 Hispanic students chose not to participate. One American Indian student participated in the AP World History examination and chose to participate in AP World History beyond-school-day tutoring. Of the eight Mixed Race students who participated in the AP World History examination, one Mixed Race student chose to participate in AP World History beyond-school-day tutoring and seven Mixed Race students chose not to participate. Finally, of the 36 White students who participated in the AP World History examination, five White students chose to participate in AP World History beyond-school-day tutoring and 31 White students chose not to participate.

#### Mean Scores

Results indicated the mean AP World History examination score of students who participated in AP beyond-school-day tutoring was 1.85 on a five-point scale with a standard deviation of 0.828. The mean AP World History examination score of students who did not participate in AP beyond-school-day tutoring was 1.88 on a five-point scale with a standard deviation of 0.992. Participation and mean AP U.S. History examination scores are displayed in Table 16.

Table 16

*Mean Advanced Placement (AP) World History Examination Scores at FHS for the 2017-2018 Academic Year by Tutoring Attendance (N = 184)*

Attended Tutoring	<i>n</i>	Mean Score	<i>SD</i>
Yes	54	1.83	0.795
No	68	1.88	0.970

Mean AP World History examination scores of students who participated in AP beyond-school-day tutoring by student subgroup indicated that Asian students ( $M = 2.33$ ) scored higher on the AP World History examination than American Indian ( $M = 2.00$ ), Hispanic ( $M = 1.85$ ), White ( $M = 1.80$ ), Black ( $M = 1.78$ ) and Mixed Race ( $M = 1.00$ ) students. Asian students at FHS who participated in tutoring during the 2017-2018 academic year had a lower mean AP World History examination score ( $M_{\text{Tutoring}} = 2.33$ ) than the one Asian student who did not participate in AP World History beyond-school-day tutoring and scored a four on a five-point scale on the AP World History examination. Black students at FHS who participated in tutoring had a higher mean score on the AP World History examination than Black students who did not participate in tutoring ( $M_{\text{Tutoring}} = 1.78, M_{\text{NoTutoring}} = 1.67$ ). Hispanic students at FHS who participated in tutoring for the 2017-2018 academic year had a higher mean score on the AP World History examination than Hispanic students who did not participate in tutoring ( $M_{\text{Tutoring}} = 1.85, M_{\text{NoTutoring}} = 1.75$ ). One American Indian student at FHS participated in the AP World History examination and in AP World History beyond-school-day tutoring for the 2017-2018 academic year and scored a two on a five-point scale on the AP World History examination. One Mixed Race student at FHS participated in AP World History beyond-school-day tutoring for the 2017-2018 academic year and scored a one on a five-



point scale on the AP World History examination and one Mixed Race student did not participate in AP World History beyond-school-day tutoring and scored a two on a five-point scale on the AP World History examination. Finally, White students at FHS who participated in AP World History beyond-school-day tutoring for the 2017-2018 academic year had a lower mean score on the AP World History examination than White students who did not participate in AP World History beyond-school-day tutoring ( $M_{\text{Tutoring}} = 1.80, M_{\text{NoTutoring}} = 2.25$ ). Descriptive data by subgroup for students who did and did not participate in AP World History beyond-school-day tutoring at FHS are displayed in Table 17.

Table 17

*AP World History Beyond-school-day Tutoring Participation and Mean AP World History Examination Scores by Race (N = 122)*

Race	Participated (n = 73)			Did Not Participate (n = 49)		
	n	Mean Score	SD	n	Mean Score	SD
Asian	3	2.33	.577	1	4.00	1.118
Black	9	1.78	.833	3	1.67	0.577
Hispanic	54	1.85	.856	36	1.75	0.874
American Indian	1	2.00	--	--	--	--
Mixed Race	1	1.00	--	1	2.00	--
Pacific Islander	--	--	--	--	--	--
White	5	1.80	.837	8	2.25	1.389

Economically Disadvantaged

The total of 122 students at FHS during the 2017-2018 academic year participated in the AP World History examination, of which 69 were identified as economically

disadvantaged and 53 were identified as not economically disadvantaged. Of the 69 students who were identified as economically disadvantaged, 45 chose to participate in AP U.S. History beyond-school-day tutoring and 24 chose not to participate. Of the 53 students who were identified as not economically disadvantaged, 28 chose to participate in AP U.S. History beyond-school-day tutoring and 25 chose not to participate.

The mean AP World History examination score of students who participated in AP beyond-school-day tutoring and were identified as economically disadvantaged was higher than students who participated in AP beyond-school-day tutoring and were not identified as economically disadvantaged ( $M_{\text{EconDis}} = 1.91$ ,  $M_{\text{NoEconDis}} = 1.83$ ).

Economically disadvantaged students at FHS who participated in AP beyond-school-day tutoring during the 2017-2018 academic year had a higher mean score on the AP World History examination than economically disadvantaged students who did not participate in AP beyond-school-day tutoring ( $M_{\text{Tutoring}} = 1.91$ ,  $M_{\text{NoTutoring}} = 1.83$ ). Students who did not identify as economically disadvantaged at FHS and who participated in AP beyond-school-day tutoring during the 2017-2018 academic year had a lower mean score on the AP World History examination than those who did not participate in AP beyond-school-day tutoring ( $M_{\text{Tutoring}} = 1.75$ ,  $M_{\text{NoTutoring}} = 1.92$ ). Descriptive data by economic status for students who did and did not participate in AP World History beyond-school-day tutoring at FHS are displayed in Table 18.

Table 18

*Student Participation in AP World History Beyond-school-day Tutoring and Mean AP World History Examination Score by Economic Status (N = 122)*

Economically Disadvantaged	<i>n</i>	Participated		Did Not Participate		
		Mean Scores	<i>SD</i>	<i>n</i>	Mean Scores	<i>SD</i>
Yes	45	1.91	0.900	24	1.83	1.007
No	28	1.75	0.701	25	1.92	0.997

#### Statistical Analysis

An independent samples t-test was utilized to determine what differences, if any, existed between AP examination scores of students who did and who did not participate in AP beyond-school-day tutoring for AP World History. The independent samples t-test was conducted to determine if statistically significant differences existed between mean AP World History examination scores of students who did and who did not participate in AP beyond-school-day tutoring. The statistical analyses were conducted with a selected probability level of  $p = 0.05$ . The difference between the mean score for students who participated in AP beyond-school-day tutoring ( $n = 54$ ,  $M = 1.83$ ) and the mean score for students who did not participate in beyond-school-day tutoring ( $n = 68$ ,  $M = 1.88$ ) for AP World History was not statistically significant at the  $p < .05$  level [ $t(120) = .307$ ,  $p = .760$ ]. Results of the independent samples t-test comparing mean AP World History examination scores for student who did and who did not participate in AP World History beyond-school-day tutoring are displayed in Table 19.

Table 19

*Independent Samples t-test: Mean AP World History Examination Scores for Tutored Students vs. Non-tutored Students (N = 122)*

Variables	Levene's Test		t	df	t-test for Equality of Means			95% CI	
	F	Sig.			Sig. (2-tailed)	Mean Difference	Std. Error Difference	LL	UL
AP World History	.246	.621	.307	120	.760	.049	.160	-.267	-.365

Research Question 3

What is the relationship between the frequency of student participation in AP beyond-school-day tutoring and AP U.S. History and AP World History examination scores in one urban Florida high school, during the 2017-2018 school year?

AP U.S. History

Participation

Of the 184 students who participated in the AP U.S. History examination at FHS during the 2017-2018 academic year, 119 students participated in AP U.S. History beyond-school-day tutoring and 65 students did not participate. A total of 13 AP U.S. History tutoring sessions were offered during the 2017-2018 academic year, following the AP U.S. History practice examination. Results indicated that 65 students attended no AP U.S. History beyond-school-day tutoring sessions, 50 attended one session, 32 students attended two sessions, 16 students attended three sessions, 8 students attended four sessions, one student attended five sessions, 7 students attended six sessions, 2 students attended seven sessions, one student attended eight sessions, one student attended 11 sessions, and one student attended 13 sessions. Table 20 displays the number of students who attended AP U.S. History beyond-school-day tutoring by frequency of sessions attended.

## Mean Scores

The mean AP U.S. History examination score was 1.83 on a five-point scale with a standard deviation of 1.013. The mean number of sessions AP beyond-school-day tutoring attended for AP U.S. History was 1.56, with a standard deviation of 1.999. Mean AP U.S. History examination scores and frequency of AP U.S. History beyond-school-day tutoring attendance are displayed in Table 20.

Table 20

*Frequency of Participation in Two-hour Advanced Placement (AP) Beyond-school-day Tutoring Sessions and Mean AP U.S. History Examination Scores (N = 184)*

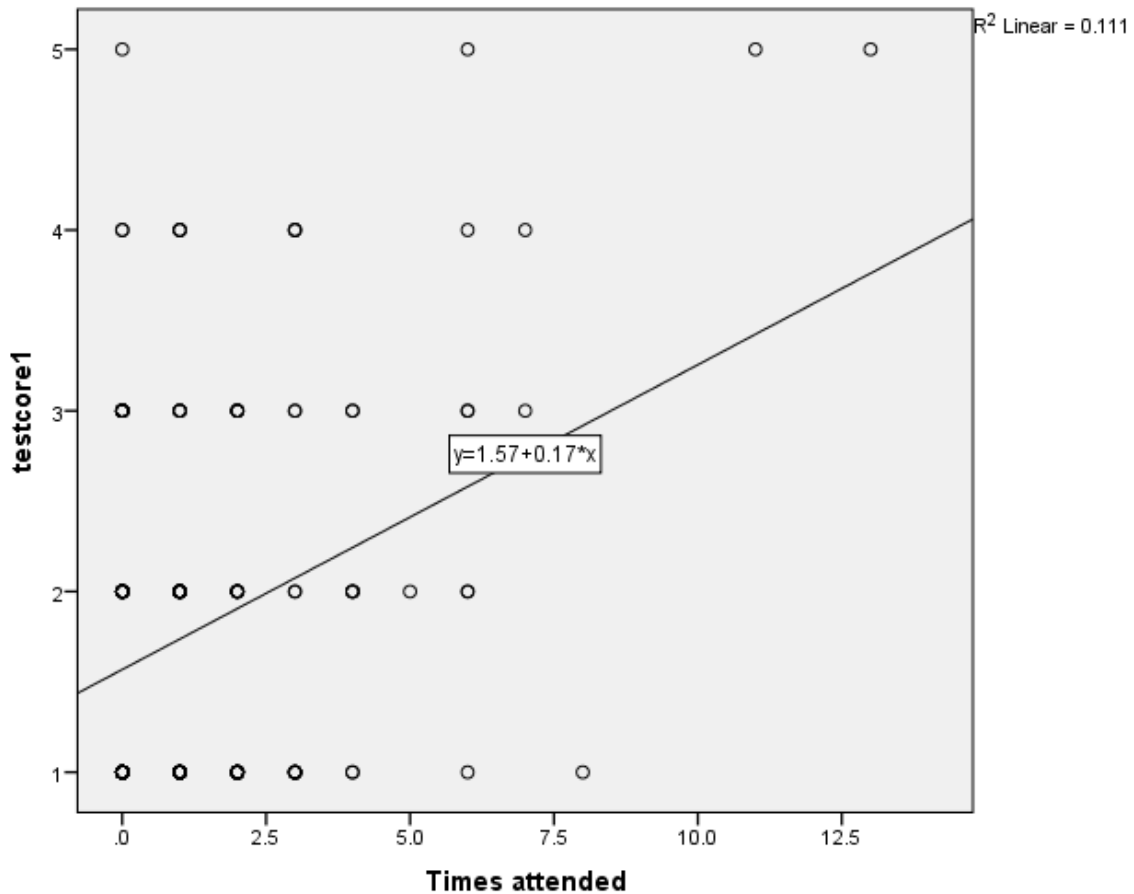
AP U.S. History (N = 184)	Mean	Std. Deviation
Attendance	1.56	1.999
Test Score	1.83	1.013

Sixty-five students ( $M = 1.77$ ) did not attend any AP U.S. History beyond-school-day tutoring sessions while 119 students ( $M = 1.87$ ) attended between one and 13 sessions. Mean AP U.S. History examination scores were compared by number of tutoring sessions attended to analyze whether a threshold existed for the minimum number of sessions required before improvements in examination scores occurred. At two or more sessions of tutoring, mean scores continue to rise with each additional AP beyond-school-day tutoring session attended, with the exception of one student who attended eight sessions and scored a one on the AP U. S. History examination. A larger mean difference ( $M_{\text{diff}} = 0.86$ ) occurred in AP U.S. History beyond-school-day tutoring between students who attended five and six AP U.S. History beyond-school-day tutoring sessions. Additionally, both students who attended more than eight sessions (one attended 11 and the other attended 13) AP U.S. History tutoring sessions scored a five on a five-point scale, the highest score attainable. Table 21 lists mean AP U.S. History examination scores by frequency of tutoring sessions attended.

Table 21

*Mean Advanced Placement (AP U.S. History Examination Scores by Frequency of Two-hour Tutoring Sessions Attended (N = 184)*

	Two-Hour Sessions										
Attendees	0	1	2	3	4	5	6	7	8	11	13
Number of Attendees	65	50	32	16	8	1	7	2	1	1	1
Mean Score	1.77	1.70	1.56	1.94	2.00	2.00	2.86	3.50	1.00	5.00	5.00



*Figure 1. AP U.S. History Examination scores by number of AP U.S. History tutoring sessions attended at FHS for the 2017-2018 academic year*

### Statistical Analysis

A Pearson Correlation was used to answer the third research question, analyzing the relationship between frequency of participation in AP beyond-school-day tutoring and

AP U.S. History and AP World History examination scores. AP beyond-school-day tutoring occurred in two-hour sessions. The Pearson Correlation was run using number of times AP beyond-school-day tutoring was attended, not number of hours attended.

The relationship between frequency of AP U.S. History beyond-school-day tutoring two-hour sessions and AP U.S. History examination scores was statistically significant at the 0.01 level [ $r = .333, n = 184, p = .000$ ]. Results indicated that as the number of AP U.S. History tutoring sessions increased, so did the student AP U.S. History examination score. Table 22 lists the results of the Pearson Correlation.

#### Additional Analysis: AP U.S. History

With the identification of an outlier in the data set, the student who attended eight AP U.S. History beyond-school-day tutoring sessions, the researcher decided to run an additional Pearson correlation, excluding the outlier data point. The second Pearson correlation was conducted to determine what effect, if any, the outlier had on the strength of the relationship between AP U.S. History beyond-school-day tutoring and AP U.S. History examination scores. The relationship between frequency of AP U.S. History beyond-school-day tutoring two-hour sessions and AP U.S. History examination scores with the outlier removed increased the statistical significance of the correlation at the 0.01 level [ $r = .358, n = 183, p = .000$ ].

With the outlier removed from the data set and beginning with a minimum of three sessions attended, mean AP U.S. History examination scores increased with each tutoring session. Additionally, each of the two students who attended 11 and 13 sessions scored a five on the AP U.S. History examination on a five-point scale. Mean scores by number of AP U.S. History beyond-school-day tutoring sessions attended are displayed in Table 22.

Table 22

*Mean Advanced Placement (AP) U.S. History Examination Scores by Frequency of Two-hour tutoring Sessions Attended With Outlier Removed (N = 183)*

	Two Hour Sessions									
	0	1	2	3	4	5	6	7	11	13
Number of Attendees	65	50	32	16	8	1	7	2	1	1
Mean Score	1.77	1.70	1.56	1.94	2.00	2.00	2.86	3.50	5.00	5.00

### Participation

Of the 122 students who participated in the AP World History examination at FHS during the 2017-2018 academic year 73 students participated in AP World History beyond-school-day tutoring and 49 students did not participate. A total of seven AP World History beyond-school-day tutoring sessions were offered during the 2017-2018 academic year, following the administration of the AP World History practice examination. Results indicated that 49 students attended zero sessions, 34 students attended one session, 16 students attended two sessions, 13 students attended three sessions, six students attended four sessions, no students attended five sessions, three students attended six sessions, and one student attended seven sessions. Table 23 displays the frequency of student participation in AP World History beyond-school-day tutoring.

Table 23

*Frequency of Two-hour Advanced Placement (AP) World History Tutoring Sessions Attended (N = 122)*

	Two-Hour Sessions								
	0	1	2	3	4	5	6	7	
Number of Attendees	49	34	16	13	6	0	3	1	



### Mean Scores

The frequency of AP beyond-school-day tutoring attendance for AP World History was 0.82 with a standard deviation of 1.164. The mean AP World History examination score was 1.86 with a standard deviation of 0.894 on a five-point scale. Mean frequency of AP World History beyond-school-day tutoring attendance and the mean AP World History examination score are displayed in Table 24.

Table 24

*Mean Frequency of Participation in Advanced Placement (AP) World History Beyond-school-day Tutoring and Mean AP World History Examination Scores (N = 122)*

AP World History (N = 122)	Mean	Std. Deviation
Attendance	0.82	1.164
Test Score	1.86	0.894

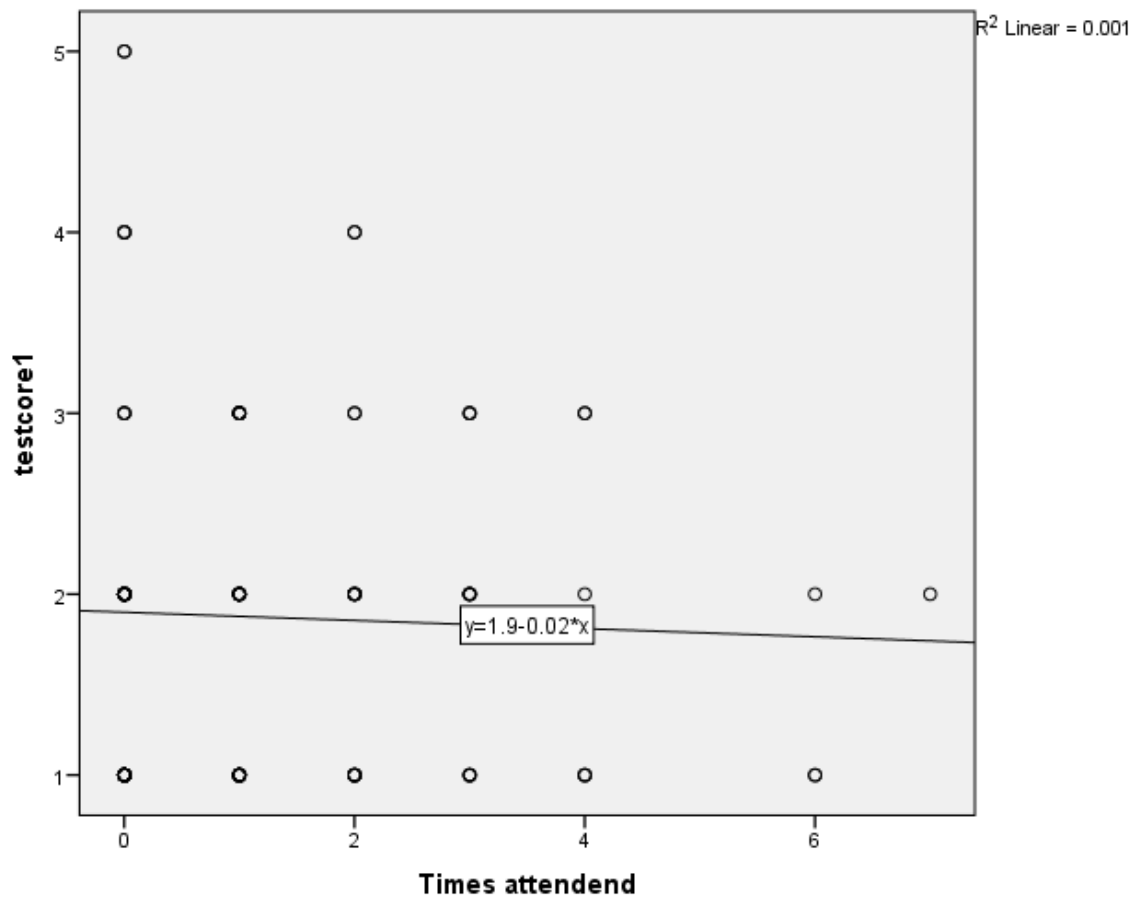
Mean AP World History examination scores were also compared by number of tutoring sessions attended to analyze whether a threshold existed in the minimum number of sessions attended before improvements in examination scores occurred. Results indicated that the mean AP World History examination score was 1.88 for students who attended zero sessions, 1.79 for students who attended one session, 2.00 for students who attended two sessions, 1.92 for students who attended three sessions, 1.83 for students who attended four sessions, 1.33 for students who attended six sessions, and the AP World History examination score of the one student who attended seven sessions was a two on a five-point scale. No noticeable improvements in AP World History examination scores were noted as a result of AP World History beyond-school-day tutoring. Table 25 lists mean AP World History examination scores by number of tutoring sessions attended.

Table 25

*Mean Advanced Placement (AP) World History Examination Scores by Frequency of Two-hour tutoring Sessions Attended (N = 122)*

	Two-Hour Sessions							
	0	1	2	3	4	5	6	7
Number of Attendees	49	34	16	13	6	0	3	1
Mean Score	1.88	1.79	2.00	1.92	1.83	--	1.33	2.00

Figure 2 shows a visual representation of the data comparing AP U.S. History examination scores by number of AP beyond-school-day tutoring sessions attended.



*Figure 2. AP U.S. History examination scores by number of AP World History tutoring sessions attended at FHS for the 2017-1018 academic year.*

## Statistical Analysis

The relationship between frequency of AP World History beyond-school-day tutoring and AP World History examination scores was slightly negative and not statistically significant [ $r = -.024$ ,  $n = 122$ ,  $p = .790$ ]. Results indicated no significant relationship between number of AP World History tutoring sessions attended and resultant AP World History examination scores meaning that AP World History examination scores did not improve as the frequency of AP World History beyond-school-day tutoring sessions increased. Results of the Pearson Correlation for AP World History are presented in Table 29.

### AP U.S. History and AP World History Combined

AP U.S. History and AP World History data were also combined to compare examination scores by number of tutoring sessions attended to determine whether a threshold existed for the number of tutoring sessions required before improvements in examination scores occurred. Results indicated that the mean combined AP examination score was 1.82 for students who attended zero sessions, 1.74 for students who attended one session, 1.71 for students who attended two sessions, 1.93 for students who attended three sessions, 1.93 for students who attended four sessions, 2.40 for students who attended six sessions, and 3.00 for students who attended seven sessions. Additionally, there was one student who attended five sessions and scored a two, one student who attended eight sessions and scored a one, and two students who scored a five and attended 11 sessions and 13 sessions on a five-point scale. The greatest change in mean AP examination score ( $M_{\text{Change}} = 2.00$ ) based on frequency of AP beyond-school-day tutoring attendance was found for students who participated in 11 or more AP beyond-school-day tutoring sessions of a possible 13 (with the exception of the one student who

attended eight sessions and scored a one on the AP U.S. History examination). Table 26 displays mean AP examination scores by frequency of tutoring sessions attended for AP U.S. History and AP World History combined.

Table 26

*Mean Advanced Placement Examination Score by Frequency of Two-hour Tutoring Sessions: AP U.S. History and AP World History Combined (N = 305)*

	Two-Hour Sessions										
	0	1	2	3	4	5	6	7	8	11	13
Number of Attendees	114	84	48	29	14	1	10	3	1	1	1
Mean Score	1.82	1.74	1.71	1.93	1.93	2.00	2.40	3.00	1.00	5.00	5.00

Figure 3 shows a visual representation of the data comparing AP U.S. History examination scores by number of AP beyond-school-day tutoring sessions attended.

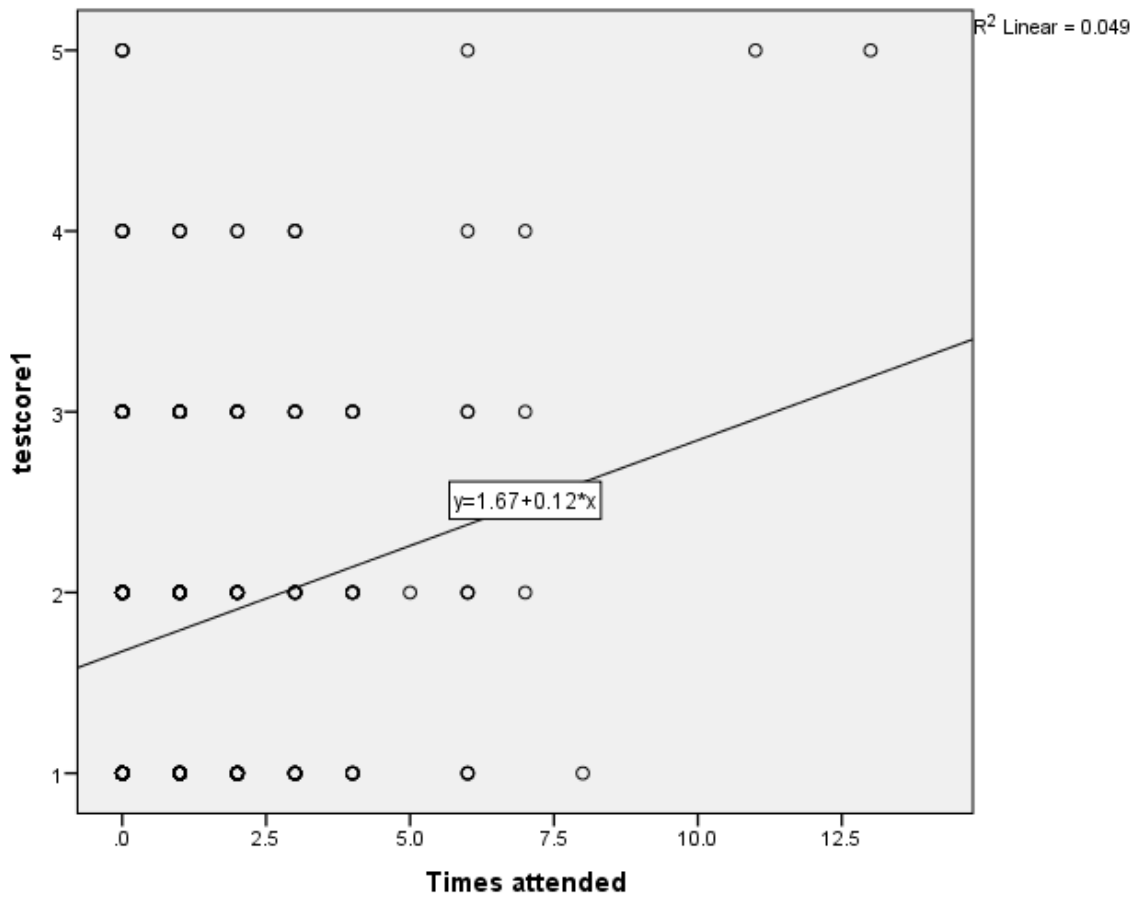


Figure 3. AP U.S. History and AP World History combined examination scores by number of AP tutoring sessions attended at FHS for the 2017-2018 academic year

Statistical Analysis: AP U.S. History and AP World History Combined

The relationship between frequency of AP U.S. History and AP World History beyond-school-day tutoring and AP U.S. History and AP World History examination scores was statistically significant at the  $p < .01$  level [ $r = .220, n = 306, p = .000$ ].

Results indicated that as the number of AP U.S. History and AP World History tutoring sessions increased, so did student AP U.S. History and AP World History examination scores.

#### Research Question 4

How do AP U.S. History and AP World History examination scores compare for the urban Florida high school to be studied (FHS) and a demographically matched high school (MHS) that did not implement AP beyond-school-day tutoring, in one urban Florida school district?

#### AP U.S. History

##### Participation

A large difference existed in participation rates in AP U.S. History examination at FHS ( $N = 184$ ) and MHS ( $N = 56$ ) for the 2017-2018 academic year. Although the student population at FHS ( $N = 2507$ ) was lower than the student population at MHS ( $N = 2838$ ), enrollment in AP U.S. History at FHS was 70% higher than it was at MHS for the 2017-2018 academic year.

Of the 184 students who participated in the AP U.S. History examination at FHS, participation by student subgroups indicated that 13 Asian, 23 Black, 133 Hispanic, two American Indian, four Mixed Race, and 28 White students participated in the AP U.S. History examination. Of the 56 students who participated in the AP U.S. History examination at MHS, participation by student subgroup indicated that four Asian, nine Black, 33 Hispanic, three Mixed Race, and seven White students participated in the AP U.S. History examination.

##### Mean Scores

A large difference existed in participation rates in the AP U.S. History examination at FHS ( $N = 184$ ) and MHS ( $N = 56$ ) for the 2017-2018 academic year, however students at FHS had a higher mean AP U.S. History examination score than students at MHS. Results indicated that the mean AP U.S. History examination score at

FHS ( $M = 1.83$ ) was slightly higher than the mean score at MHS ( $M = 1.71$ ) on a five-point scale. Participation rates and mean AP U.S. History examination scores for FHS and MHS are displayed in Table 27.

Table 27

*Mean Advanced Placement (AP) U.S. History Examination Scores for the 2017-2018 Academic Year by School (N = 240)*

High School	<i>n</i>	Mean Score	<i>SD</i>
FHS	184	1.83	1.013
MHS	56	1.71	0.889

Mean AP U.S. History examination scores of FHS student subgroups indicated that American Indian students ( $M = 2.33$ ) scored higher on the AP U.S. History examination than White ( $M = 2.32$ ), Asian ( $M = 2.08$ ), Black ( $M = 2.00$ ), Mixed Race ( $M = 1.75$ ) and Hispanic ( $M = 1.64$ ) students. Mean AP U.S. History examination scores of MHS student subgroups indicated that Asian students ( $M = 2.75$ ) scored higher on the AP U.S. History examination than White ( $M = 1.86$ ), Mixed Race ( $M = 1.67$ ), Hispanic ( $M = 1.64$ ), and Black ( $M = 1.44$ ) students.

Asian students at MHS had a higher mean score on the AP U.S. History examination than Asian students at FHS ( $M_{\text{FHS}} = 2.08$ ,  $M_{\text{MHS}} = 2.75$ ). Black students at FHS had a higher mean score than Black students at MHS ( $n_{\text{FHS}} = 2.00$ ,  $n_{\text{MHS}} = 1.44$ ). Hispanic students at FHS and MHS had equal mean scores ( $M_{\text{FHS}} = 1.64$ ,  $M_{\text{MHS}} = 1.64$ ). Mean AP U.S. History examination scores of American Indian students at FHS were slightly higher than at MHS ( $M_{\text{FHS}} = 1.75$ ,  $M_{\text{MHS}} = 1.67$ ). Finally, White students at FHS had a higher mean score on the AP U.S. History examination than White students at

MHS ( $M_{FHS} = 2.32$ ,  $M_{MHS} = 1.86$ ). Descriptive data by student subgroup of mean U.S. History examination score at FHS and MHS are displayed in Table 28.

Table 28

*Mean Advanced Placement (AP) U.S. History Examination Scores by School and Race (N = 240)*

Race	<i>n</i>	FHS ( <i>n</i> = 184)		MHS ( <i>n</i> = 56)		
		Mean Scores	<i>SD</i>	<i>n</i>	Mean Scores	<i>SD</i>
Asian	13	2.08	1.320	4	2.75	.957
Black	23	2.00	1.087	9	1.44	.527
Hispanic	113	1.64	.835	33	1.64	.929
American Indian	3	2.33	1.155	--	--	--
Mixed Race	4	1.75	.957	3	1.67	.577
Pacific Islander	--	--	--	--	--	--
White	28	2.32	1.278	7	1.86	.900

### Economically Disadvantaged

Of the 184 students at FHS who participated in the AP U.S. History examination, 97 were identified as economically disadvantaged, 86 were identified as not economically disadvantaged, and one student had no economic status reported and was excluded from the comparison. Of the 56 students at MHS who participated in the AP U.S. History examination, 37 were identified as economically disadvantaged and 19 were identified as not economically disadvantaged.

The mean AP U.S. History examination score of FHS students who were identified as economically disadvantaged was slightly lower than the mean of students who were not identified as economically disadvantaged ( $M_{EconDis} = 1.80$ ,  $M_{NoEconDis} =$



1.86). The mean AP U.S. History examination score of MHS students who were identified as economically disadvantaged was lower than the mean of students who were not identified as economically disadvantaged ( $M_{\text{EconDis}} = 1.68$ ,  $M_{\text{NoEconDis}} = 1.79$ ).

The mean AP U.S. History examination score of economically disadvantaged students at FHS was higher than for economically disadvantaged students at MHS ( $M_{\text{FHS}} = 1.80$ ,  $M_{\text{MHS}} = 1.68$ ). Additionally, mean AP U.S. History examination scores of students who were not identified as economically disadvantaged were also higher at FHS than MHS ( $M_{\text{FHS}} = 1.86$ ,  $M_{\text{MHS}} = 1.79$ ). Descriptive data by student economic status and mean AP U.S. History examination score at FHS and MHS are displayed in Table 29.

Table 29

*Mean Advanced Placement (AP) U.S. History Examination Scores by School and Economic Status (N = 240)*

Economically Disadvantaged	<i>n</i>	FHS ( <i>n</i> = 184)		MHS ( <i>n</i> = 56)		
		Mean Score	<i>SD</i>	<i>n</i>	Mean Score	<i>SD</i>
Yes	97	1.80	1.027	37	1.68	0.818
No	86	1.86	1.008	19	1.79	1.032

#### Statistical Analysis

An independent samples t-test was utilized to answer the fourth research question. The independent samples t-test was conducted to determine if significant differences existed between mean AP U.S. History and AP World History examination scores of students at high school of study (FHS) and the demographically matched high school (MHS) where AP beyond-school-day tutoring was and was not offered, respectively. The statistical analyses were conducted with a selected probability level of  $p = 0.05$ .

The observed probability value comparing means and standard deviations for AP U.S. History at FHS ( $N = 184$ ) and MHS ( $N = 56$ ) was  $p = .266$ ; therefore equal variances were assumed. The difference in mean examination scores for AP U.S. History at FHS ( $M = 1.83$ ,  $SD = 1.013$ ) and MHS ( $M = 1.71$ ,  $SD = 0.889$ ) was not statistically significant at the  $p < .05$  level,  $t(238) = .836$ ,  $p = .266$ . Although both FHS and MHS had similar population sizes ( $N_{FHS} = 2507$ ,  $N_{MHS} = 2838$ ) and were demographically matched, differences existed between schools in the number of students enrolled in AP U.S. History and those taking AP U.S. History examination ( $n_{FHS} = 184$ ,  $n_{MHS} = 56$ ). The results of the statistical analysis are presented in Table 30.

Table 30

*Independent Sample t-test: Comparison of Advanced Place (AP) U.S. History Examination Scores by School (N = 240)*

Subject	Levene's Test		t	df	t-test for Equality of Means			95% C.I.	
	F	Sig.			Sig. (2-tailed)	Mean Diff.	Std.Err. Diff.	LL	UL
AP U.S. History	1.242	.266	.836	238.00	.437	.117	.150	-.179	.414

### AP World History

#### Participation

A total of 239 students participated in the AP World History examination at FHS and MHS during the 2017-2018 academic year. Participation in the AP World History examination at FHS ( $n = 122$ ) was slightly higher than participation at MHS ( $n = 117$ ).

Participation by student subgroup at FHS indicated that four Asian, 12 Black, 90 Hispanic, one American Indian, two Mixed Race, and 13 White students participated in the AP World History examination for the 2017-2018 academic year. Participation at MHS by subgroup indicated that eight Asian, 10 Black, 69 Hispanic, six Mixed Race, one

Pacific Islander, and 23 White students participated in the AP World History examination for the 2017-2018 academic year.

A comparison of participation rates by subgroup at FHS and MHS indicated that more Asian ( $n_{FHS} = 4$ ,  $n_{MHS} = 8$ ), Mixed Race ( $n_{FHS} = 2$ ,  $n_{MHS} = 6$ ), Pacific Islander ( $n_{FHS} = 0$ ,  $n_{MHS} = 1$ ), and White ( $n_{FHS} = 13$ ,  $n_{MHS} = 23$ ) students participated in the AP World History examination at MHS than participated at FHS for the 2017-2018 academic year. Conversely, more Black ( $n_{FHS} = 12$ ,  $n_{MHS} = 10$ ), Hispanic ( $n_{FHS} = 90$ ,  $n_{MHS} = 69$ ), and American Indian ( $n_{FHS} = 1$ ,  $n_{MHS} = 0$ ) students participated in the AP World History examination at FHS than participated at MHS for the academic year.

### Mean Scores

The overall mean AP World History examination score at FHS ( $M = 1.86$ ) was lower than the mean AP World History score at MHS ( $M = 2.46$ ) on a five-point scale for the 2017-2018 academic year. Mean AP World History scores for FHS and MHS are displayed in Table 31.

Table 31

*Mean Advanced Placement (AP) World History Examination Scores for the 2017-2018 Academic Year by School (N = 239)*

High School	<i>n</i>	Mean Score	<i>SD</i>
FHS	122	1.86	0.894
MHS	117	2.46	1.095

Mean AP World History examination scores of FHS students by subgroup indicated that Asian students ( $M = 2.75$ ) scored higher on the AP World History examination than White ( $M = 2.08$ ), American Indian ( $M = 2.00$ ), Hispanic ( $M = 1.81$ ), Black ( $M = 1.75$ ) and Mixed Race ( $M = 1.50$ ) students. Mean AP World History

examination scores of MHS students by subgroup indicated that the Pacific Islander student who scores a three on a five-point scale scored higher on the AP World History examination than the mean scores of White ( $M = 2.87$ ), Black ( $M = 2.50$ ), Mixed Race ( $M = 2.50$ ), Hispanic ( $M = 2.35$ ), and Asian ( $M = 2.13$ ) students.

A comparison of mean scores by student subgroups indicated that Asian students at FHS had a higher mean score on the AP World History examination than Asian students at MHS ( $M_{FHS} = 2.75$ ,  $M_{MHS} = 2.13$ ). Conversely, Black ( $n_{FHS} = 1.75$ ,  $n_{MHS} = 2.50$ ), Hispanic ( $M_{FHS} = 1.81$ ,  $M_{MHS} = 2.35$ ), Mixed Race ( $M_{FHS} = 1.50$ ,  $M_{MHS} = 2.50$ ), and White students ( $M_{FHS} = 2.08$ ,  $M_{MHS} = 2.87$ ) at MHS had a higher mean AP World History examination scores than students at FHS. Descriptive data by subgroup of mean student AP World History examination scores at FHS and MHS are displayed in Table 32.

Table 32

*Mean Advanced Placement (AP) World History Examination Scores by School and Race (N = 239)*

Race	<i>n</i>	FHS ( <i>n</i> = 122)		<i>n</i>	MHS ( <i>n</i> = 117)	
		Mean Score	<i>SD</i>		Mean Score	<i>SD</i>
Asian	4	2.75	.957	8	2.13	.991
Black	12	1.75	.754	10	2.50	.972
Hispanic	90	1.81	.860	69	2.35	1.082
American Indian	1	2.00	--	--	--	--
Mixed Race	2	1.50	.707	6	2.50	1.378
Pacific Islander	--	--	--	1	3.00	--
White	13	2.08	1.188	23	2.87	1.140

#### Economically Disadvantaged

Of the 239 students at FHS and MHS who participated in the AP World History examination, 136 were identified as economically disadvantaged and 101 were identified as not economically disadvantaged. Of the 122 students at FHS who participated in the AP World History examination, 69 were identified as economically disadvantaged and 53 were identified as not economically disadvantaged. Of the 117 students at MHS who participated in the AP World History examination, 67 were identified as economically disadvantaged and 48 were identified as not economically disadvantaged.

The mean AP World History examination score of FHS students who were identified as economically disadvantaged ( $M = 1.88$ ) was slightly higher than the mean score of students who were not identified as economically disadvantaged ( $M = 1.83$ ).

The mean AP World History examination score of MHS students who were identified as economically disadvantaged ( $M = 2.46$ ) was the same as the mean of students who were not identified as economically disadvantaged ( $M = 2.46$ ). The mean AP World History examination score of economically disadvantaged students at FHS was lower than for economically disadvantaged students at MHS ( $M_{FHS} = 1.88$ ,  $M_{MHS} = 2.46$ ). Similarly, the mean AP World History examination score of students at FHS who were not identified as economically disadvantaged was lower than the mean examination score at MHS ( $M_{FHS} = 1.83$ ,  $M_{MHS} = 2.46$ ). Descriptive data of mean student AP World History examination scores at FHS and MHS by economic status are displayed in Table 33.

Table 33

*Mean Advanced Placement (AP) World History Examination Scores by School and Economic Status (N = 239)*

Economically Disadvantaged	<i>n</i>	FHS		<i>n</i>	MHS	
		Mean Scores	<i>SD</i>		Mean Score	<i>SD</i>
Yes	69	1.88	0.932	67	2.46	1.133
No	53	1.83	0.849	48	2.46	1.071

#### Statistical Analysis

The observed probability value comparing means for AP World History at FHS ( $N = 122$ ) and MHS ( $N = 117$ ) was  $p = .002$ , therefore equal variances were not assumed. The difference in mean examination scores for AP World History at FHS ( $M = 1.86$ ) and MHS ( $M = 2.46$ ) was statistically significant at the  $p < .05$  level,  $t(223.93) = -4.637$ ,  $p = .000$ , indicating that MHS students scored significantly higher on the AP World History

examination than did FHS students. The results of the statistical analysis are presented in Table 34.

Table 34

*Independent Sample t-test: Comparison of Advanced Placement (AP) World History Examination Scores by School (N = 239)*

Subject	Levene's Test		T	df	t-test for Equality of Means			95% C.I.	
	F	Sig.			Sig. (2-tailed)	Mean Diff.	Std.Err. Diff.	LL	UL
AP World History	9.946	.002	-4.637	223.93	.000	-.601	.130	-.856	-.346

### Research Question 5

How do AP U.S. History and AP World History examination results for the 2017-2018 school year compare to AP U.S. History and AP World History examination results from the 2016-2017 school year, prior to implementation of AP practice examinations and AP beyond-school-day tutoring for the same urban Florida high school?

#### AP U.S. History

##### Participation

A total of 129 students at FHS participated in the AP U.S. History examination for the 2016-2017 academic year. A total of 184 students at FHS participated in the AP U.S. History examination for the 2017-2018 academic year, a 30% increase from the previous year.

Student participation by student subgroup at FHS for the 2016-2017 academic year indicated that 13 Asian, 12 Black, 74 Hispanic, six Mixed Race, and 24 White students participated in the AP U.S. History examination. Student participation by student subgroup at FHS for the 2017-2018 academic year indicated that 13 Asian, 23

Black, 113 Hispanic, three American Indian, four Mixed Race, and 28 White students participated in the AP U.S. History examination.

Student subgroup comparison between the 2016-2017 and 2017-2018 academic years at FHS indicated that participation the AP U.S. History examination by Asian students remained the same ( $n_{2016-2017} = 13$ ,  $n_{2017-2018} = 13$ ). Participation by Black ( $n_{2016-2017} = 12$ ,  $n_{2017-2018} = 23$ ), Hispanic ( $n_{2016-2017} = 74$ ,  $n_{2017-2018} = 113$ ), American Indian ( $n_{2016-2017} = 0$ ,  $n_{2017-2018} = 1$ ) and White ( $n_{2016-2017} = 24$ ,  $n_{2017-2018} = 28$ ) students increased from the 2016-2017 to the 2017-2018 academic years. The only student subgroup to decrease between the 2016-2017 and 2017-2018 academic years was Mixed Race ( $n_{2016-2017} = 6$ ,  $n_{2017-2018} = 4$ ) students.

### Mean Scores

The mean AP U.S. History examination score at FHS for the 2016-2017 academic year ( $N = 129$ ) was 1.91 with a standard deviation of 1.023. The mean AP U.S. History examination score at FHS for the 2017-2018 academic year ( $N = 184$ ) was 1.83 with a standard deviation of 1.013. Mean AP U.S. History examination scores by academic year are displayed in Table 35.

Table 35

*Mean Advanced Placement (AP) U.S. History Examination Scores at Florida High School (FHS) by Year: 2016-2017 and 2017-2018 (N = 313)*

Academic Year	<i>n</i>	Mean Score	<i>SD</i>
2016-2017	129	1.91	1.023
2017-2018	184	1.83	1.013



Mean AP U.S. History examination scores of FHS students by subgroup for the 2016-2017 academic year indicated that White students ( $M = 2.33$ ) scored higher on the AP U.S. History examination than Mixed Race ( $M = 2.00$ ), Asian ( $M = 1.92$ ), Hispanic ( $M = 1.82$ ), and Black ( $M = 1.58$ ) students. Mean AP U.S. History examination scores of FHS students by subgroup for the 2017-2018 academic year ( $N = 184$ ) indicated that American Indian students ( $M = 2.33$ ) scored higher on the AP U.S. History examination than White ( $M = 2.32$ ), Asian ( $M = 2.08$ ), Black ( $M = 2.00$ ), Mixed Race ( $M = 1.75$ ) and Hispanic ( $M = 1.64$ ) students.

Student subgroup comparison between the 2016-2017 and 2017-2018 academic years at FHS indicated that Asian students for the 2016-2017 academic year had a higher mean score on the AP U.S. History examination than Asian students for the 2017-2018 academic year ( $M_{2016-2017} = 1.92$ ,  $M_{2017-2018} = 2.08$ ). The mean AP U.S. History examination score of Black students at FHS increased between the 2016-2017 and 2017-2018 academic years ( $M_{2016-2017} = 1.92$ ,  $M_{2017-2018} = 2.08$ ). The mean AP U.S. History examination score for Hispanic ( $M_{2016-2017} = 1.82$ ,  $M_{2017-2018} = 1.64$ ), Mixed Race ( $M_{2016-2017} = 1.75$ ,  $M_{2017-2018} = 1.67$ ), and White students ( $M_{2016-2017} = 2.33$ ,  $M_{2017-2018} = 2.32$ ) decreased between the 2016-2017 and 2017-2018 academic years. Descriptive data of student examination results for AP U.S. History at FHS for the 2016-2017 and 2017-2018 academic years are displayed in Table 36.

Table 36

*Participation and Mean Advanced Placement (AP) U.S. History Examination Score by Academic Year (2016-2017 and 2017-2018) and Race at Florida High School (FHS) (N = 313)*

Race	<i>n</i>	2016-2017 ( <i>n</i> = 129)		2017-2018 ( <i>n</i> = 184)		
		Mean Score	<i>SD</i>	<i>n</i>	Mean Score	<i>SD</i>
Asian	13	1.92	.862	13	2.08	1.320
Black	12	1.58	.996	23	2.00	1.087
Hispanic	74	1.82	.970	113	1.64	.835
American Indian	--	--	--	3	2.33	1.155
Mixed Race	6	2.00	1.265	4	1.75	.957
Pacific Islander	--	--	--	--	--	--
White	24	2.33	1.167	28	2.32	1.278

#### Economically Disadvantaged

Of the 129 students at FHS who participated in the AP U.S. History examination during the 2016-2017 academic year, 38 were identified as economically disadvantaged and 91 were identified as not economically disadvantaged. Of the 184 students at FHS who participated in the AP U.S. History examination during the 2017-2018 academic year, 97 were identified as economically disadvantaged, 86 were identified as not economically disadvantaged, and one student had no economic status identified and was left out of the mean comparison.

The mean AP U.S. History examination score of FHS students who were identified as economically disadvantaged ( $M = 1.74$ ) was lower than the mean of students who were not identified as economically disadvantaged ( $M = 1.99$ ) for the 2016-2017

academic year. The mean AP U.S. History examination score of FHS students who were identified as economically disadvantaged ( $M = 1.80$ ) was slightly lower than the mean of students who were not identified as economically disadvantaged ( $M = 1.86$ ) for the 2017-2018 academic year.

The mean AP U.S. History examination score of economically disadvantaged students at FHS for the 2016-2017 academic year was slightly lower than for economically disadvantaged students at FHS for the 2017-2018 academic year ( $M_{2016-2017} = 1.74$ ,  $M_{2017-2018} = 1.80$ ). The mean AP U.S. History examination score of students who were not identified as economically disadvantaged at FHS for the 2016-2017 academic year was higher than for the 2017-2018 academic year ( $M_{2016-2017} = 1.99$ ,  $M_{2017-2018} = 1.86$ ). Descriptive data of student examination results by economic status for AP U. S. History at FHS for the 2016-2017 and 2017-2018 academic years are displayed in Table 37.

Table 37

*Participation and Mean Scores in Advanced Placement (AP) U.S. History Examination by Academic Year (2016-2017 and 2017-2018) and Economic Status at Florida High School (FHS) (N = 313)*

Economically Disadvantaged	<i>n</i>	2016-2017 ( <i>n</i> = 129)		2017-2018 ( <i>n</i> = 184)		
		Mean Score	<i>SD</i>	<i>n</i>	Mean Score	<i>SD</i>
Yes	38	1.74	.795	97	1.80	1.027
No	91	1.99	1.100	86	1.86	1.008

## Statistical Analysis

An independent samples t-test was utilized to answer the fifth research question. The independent samples t-test was conducted to determine if significant differences existed between mean AP U.S. History and AP World History examination scores of students at FHS from the 2016-2017 and 2017-2018 school years, before and after the implementation of AP practice examinations and AP beyond-school-day tutoring. The statistical analyses were conducted with a selected probability level of  $p = 0.05$ .

A comparison of mean AP U.S. History examination scores for the 2016-2017 ( $n = 129$ ) and the 2017-2018 ( $n = 184$ ) academic years at FHS indicated no statistically significant difference between groups,  $t(311) = .712, p = .477$ . Results of the independent samples t-test comparing means of AP U.S. History examination results for FHS during the 2016-2017 and 2017-2018 academic years are displayed in Table 38.

Table 38

*Independent Samples t-test: Comparison of Mean Advanced Placement U.S. History Examination Scores for 2016-2017 and 2017-2018 School Years at Florida High School (FHS) (N = 313)*

Subject	Levene's Test		T	df	t-test for Equality of Means			95% CI	
	F	Sig.			Sig. (2-tailed)	Mean Diff.	Std.Err. Diff.	LL	UL
AP U.S. History	.217	.642	.712	311	.477	.083	.117	-.147	.313

## AP World History

### Participation

A total of 189 students at FHS participated in the AP World History examination during the 2016-2017 and 2017-2018 academic years. Participation in the AP World

History examination increased by 45% between the 2016-2017 ( $N = 67$ ) and 2017-2018 ( $N = 122$ ) academic years.

Participation by student subgroup for the 2016-2017 academic year indicated that one Asian, five Black, 41 Hispanic, one American Indian, four Mixed Race, and 15 White students participated in the AP World History examination at FHS. Participation by student subgroup for the 2017-2018 academic year indicated that four Asian, 12 Black, 90 Hispanic, one American Indian, two Mixed Race, and 13 White students participated in the AP World History examination at FHS.

Student subgroup participation comparison for the 2016-2017 and 2017-2018 academic years indicated that participation by Asian ( $n_{2016-2017} = 1, n_{2017-2018} = 4$ ), Black ( $n_{2016-2017} = 5, n_{2017-2018} = 12$ ), and Hispanic ( $n_{2016-2017} = 41, n_{2017-2018} = 90$ ) increased between the 2016-2017 and the 2017-2018 academic years. Participation by American Indian students remained the same ( $n_{2016-2017} = 1, n_{2017-2018} = 1$ ), while participation by Mixed Race ( $n_{2016-2017} = 4, n_{2017-2018} = 2$ ), and White students ( $n_{2016-2017} = 15, n_{2017-2018} = 13$ ) decreased between the 2016-2017 and 2017-2018 academic years.

### Mean Scores

The mean AP World History examination score at FHS for the 2016-2017 school year ( $N = 67$ ) was 1.84 with a standard deviation of 1.009. The mean AP World History scores at FHS for the 2017-2018 school year ( $N = 122$ ) was 1.86 with a standard deviation of 0.894. Although student participation in AP World History almost doubled between the 2016-2017 and 2017-2018 academic years, the mean AP World History examination score increased slightly. Mean AP World History examination scores by academic year are displayed in Table 39.

Table 39

Mean Advanced Placement (AP) world History Examination Scores at Florida High School (FHS) by Year (2016-2017 and 2017-2018 (N = 189))

Academic Year	<i>n</i>	Mean Score	<i>SD</i>
2016-2017	67	1.84	1.009
2017-2018	122	1.86	0.894

Mean AP World History examination scores of FHS students by subgroup for the 2016-2017 academic year indicated that the American Indian student ( $M = 3.00$ ) scored higher on the AP World History examination than White ( $M = 2.27$ ), Mixed Race ( $M = 2.25$ ), Asian ( $M = 2.00$ ), Hispanic ( $M = 1.63$ ), and Black ( $M = 1.60$ ) students. Mean AP World History examination scores of FHS students by subgroup for the 2017-2018 academic year indicated that Asian students ( $M = 2.75$ ) scored higher on the AP World History examination than White ( $M = 2.08$ ), American Indian ( $M = 2.00$ ), Hispanic ( $M = 1.81$ ), Black ( $M = 1.75$ ) and Mixed Race ( $M = 1.50$ ) students.

A comparison of mean AP World History examination scores by student subgroup indicated that the mean AP World History examination score of Asian students ( $M_{2016-2017} = 2.00$ ,  $M_{2017-2018} = 2.75$ ), Black students ( $M_{2016-2017} = 1.60$ ,  $M_{2017-2018} = 1.75$ ), and Hispanic students ( $M_{2016-2017} = 1.63$ ,  $M_{2017-2018} = 1.81$ ) all increased from the 2016-2017 to the 2017-2018 academic year at FHS. There was only one American Indian student who participated in the AP World History examination for each of the 2016-2017 and 2017-2018 academic years. The AP World History examination score of the American Indian student at FHS for the 2016-2017 academic year scored a three on a five-point scale whereas the American Indian student for the 2017-2018 academic year

scored a 2 on a five-point scale. The mean AP World History examination score of Mixed Race ( $M_{2016-2017} = 2.25$ ,  $M_{2017-2018} = 1.50$ ) and White ( $M_{2016-2017} = 2.27$ ,  $M_{2017-2018} = 2.08$ ) students at FHS decreased between the 2016-2017 and 2017-2018 academic years.

Descriptive data by student subgroup of mean student AP World History examination scores at FHS for the 2016-2017 and 2017-2018 academic years are displayed in Table 40.

Table 40

*Mean Advanced Placement (AP) World History Examination Score by Student Subgroup and Academic Year (2016-2017 and 2017-2018) at Florida High School (FHS) (N = 189)*

Race	n	2016-2017 (n = 67)		2017-2018 (n = 122)		
		Mean Scores	SD	n	Mean Scores	SD
Asian	1	2.00	--	4	2.75	.957
Black	5	1.60	.894	12	1.75	.754
Hispanic	41	1.63	.994	90	1.81	.860
Indian	1	3.00	--	1	2.00	--
Mixed Race	4	2.25	.500	2	1.50	.707
Pacific Islander	--	--	--	--	--	--
White	15	2.27	1.100	13	2.08	1.188

### Economically Disadvantaged

Of the 67 students at FHS who participated in the AP World History examination during the 2016-2017 academic year, 29 were identified as economically disadvantaged and 37 were identified as not economically disadvantaged. Of the 122 students at FHS who participated in the AP World History examination during the 2017-2018 academic

year, 69 were identified as economically disadvantaged and 53 were identified as not economically disadvantaged.

Participation by economic status for the 2016-2017 academic year indicated that of the 67 students who participated in the AP World History examination, 29 were identified as economically disadvantaged, 37 were identified as not economically disadvantaged, and one had no economic status identified. Participation by economic status for the 2017-2018 academic year indicated that of the 122 students who participated in the AP World History examination, 69 were identified as economically disadvantaged, and 53 were identified as not economically disadvantaged.

The mean 2016-2017 AP World History examination score of FHS students who were identified as economically disadvantaged ( $M = 1.76$ ) was lower than the mean of students who were not identified as economically disadvantaged ( $M = 1.84$ ). Conversely, the mean 2017-2018 AP World History examination score of FHS students who were identified as economically disadvantaged ( $M = 1.88$ ) was slightly higher than the mean of students who were not identified as economically disadvantaged ( $M = 1.83$ ).

A comparison of mean AP World History examination scores by academic year indicated that the mean AP World History examination score of economically disadvantaged students at FHS for the 2016-2017 academic year was lower than for the 2017-2018 academic year ( $M_{2016-2017} = 1.76$ ,  $M_{2017-2018} = 1.88$ ). The mean AP World History examination scores of students who were not identified as economically disadvantaged at FHS for the 2016-2017 and 2017-2018 academic years were similar ( $M_{2016-2017} = 1.84$ ,  $M_{2017-2018} = 1.83$ ). Descriptive data of student examination results by economic status for AP World History at FHS for the 2016-2017 and 2017-2018 academic years are displayed in Table 41.



Table 41

*Mean Advanced Placement (AP) World History Examination Score by Economic Status and Academic Year (2016-2017 and 2017-2018) at Florida High School (FHS (N = 189))*

Economically Disadvantaged	<i>n</i>	2016-2017 ( <i>n</i> = 67)		2017-2018 ( <i>n</i> = 122)	
		Mean Score	<i>SD</i>	Mean Score	<i>SD</i>
Yes	29	1.76	.872	69	1.88 .932
No	37	1.84	1.068	53	1.83 .849

#### Statistical Analysis

A comparison of mean AP World History examination scores for the 2016-2017 (*n* = 67) and 2017-2018 (*n* = 122) academic years indicated that there was no statistically significant difference between groups,  $t(187) = -.168, p = .867$ . Although no difference of means was found between groups, there was a large increase in the number of students who participated in the AP World History examination for the 2017-2018 academic year. Results of the independent samples t-test comparing means of AP World History examination results for FHS for the 2016-2017 and 2017-2018 academic years are displayed in Table 42.

Table 42

*Independent Samples t-test: Comparison of Mean Advanced Placement World History Examination Scores for 2016-2017 and 2017-2018 School Years at Florida High School (FHS) (N = 189)*

Subject	Levene's Test		t-test for Equality of Means					95% CI	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Diff.	Std.Err. Diff.	LL	UL
AP World History	3.967	.048	-.168	122.692	.867	-.025	.147	-.317	.267

### Summary

The introduction to this chapter included a restatement of the purpose of the statistical analyses to be conducted, followed by a presentation of the descriptive statistics and statistical tests conducted for each research question. Although no statistical test was conducted for Research Question One due to a limited sample size of students who did not participate in AP practice examinations for AP U.S. History ( $n = 5$ ) and AP World History ( $n = 4$ ) at FHS, descriptive statistics were presented for Research Question 1. Statistical analyses for the remaining four research questions were conducted.

Although no statistically significant difference was found to exist between mean scores of students at FHS who did and did not participate in AP beyond-school-day tutoring in general, further analysis of mean scores based on number of tutoring sessions attended revealed a statistically significant correlation between AP beyond-school-day tutoring participation and AP examination scores for AP U.S. History. Additionally, a threshold of six tutoring sessions was identified where greater increases in AP U.S. History examination scores occurred, indicating a requisite number of tutoring sessions in order for larger gains to be achieved.

Chapter 5 contains a summary and discussion of the findings and further analysis of the results presented in Chapter 4. Discussion includes possible causes for trends and variations in the data, implications of this study, and recommendations for further research.

## CHAPTER 5 SUMMARY, DISCUSSION, AND RECOMMENDATIONS

### Introduction

This chapter summarizes the purpose of this study, the population, research design, and instrumentation used to analyze the effect of AP practice examinations and AP beyond-school-day tutoring on improving AP U.S. History and AP World History examination scores. Findings related to the five research questions which guided the study are summarized and discussed. Conclusions are drawn based on analysis of the quantitative data discussed. Limitations of the study are also stated, and possible implications for policy and practice are offered, along with recommendations for further research.

### Summary of the Study

The purpose of this study was to examine the efficacy of the instructional approaches of AP practice examinations and AP beyond-school-day tutoring in improving student performance on AP examinations. Results of this study were intended to inform school district and school level leaders on how to best provide support for students enrolled in AP courses, and who take AP examinations, thereby improving their success on AP examinations. AP U.S. History and AP World History courses were selected as the focus of this study as they were the two AP courses at the Florida high school of study (FHS) with the highest enrollments.

For this study, a purposive sample of all students at FHS ( $n = 304$ ) and MHS ( $n = 175$ ) who were enrolled in AP U.S. History or AP World History, and who participated in the subsequent AP U.S. History or AP World History examinations during the 2017-2018 academic year. The following five research questions guided this research.

1. What differences exist between AP U.S. History and AP World History examination scores of students who did and did not participate in AP U.S. History and AP World History practice examinations at one urban Florida high school during the 2017-2018 school year?
2. How do AP examination scores of students who participated in AP beyond-school-day tutoring program compare to AP examination scores of students who did not participate in AP beyond-school-day tutoring for AP U.S. History and AP World History at one urban Florida high school during the 2017-2018 school year?
3. What is the relationship between the frequency of student participation in AP beyond-school-day tutoring and AP U.S. History and AP World History examination scores in one urban Florida high school, during the 2017-2018 school year?
4. How do AP U.S. History and AP World History examination scores compare for the urban Florida high school to be studied (FHS) and a demographically matched high school (MHS) that did not implement AP beyond-school-day tutoring, in one urban Florida school district?
5. How do AP U.S. History and AP World History examination results for the 2017-2018 school year compare to AP U.S. History and AP World History examination results from the 2016-2017 school year, prior to implementation of AP practice examinations and AP beyond-school-day tutoring for the same urban Florida high school?

AP practice examination participation and AP beyond-school-day tutoring participation data were collected with the assistance of FHS administrators and forwarded

to the school district of study. The school district of study combined participation data with AP U.S. History and AP World History examination scores for students at FHS for the 2017-2018 academic year, de-identified the data and returned the data to the researcher. AP U.S. History and AP World History examination scores for students at MHS for the 2017-2018 academic year and for students at FHS for the 2016-2017 academic year were also de-identified and transmitted to the researcher.

Quantitative methods were used to answer all five research questions. No statistical test was conducted to respond to Research Question One, as the sample sizes of students who did not participate in AP practice examinations for AP U.S. History ( $n = 5$ ) and AP World History ( $n = 4$ ) were too small. An independent samples t-test was utilized to answer Research Question Two. A Pearson Correlation was utilized to answer Research Question Three. Finally, independent samples t-tests were used to answer Research Questions Four and Five. All data were analyzed using SPSS to determine what effect, if any, the implementation of AP practice examinations and AP beyond-school-day tutoring had on AP U.S. History and AP World History examination scores at FHS.

#### Discussion of the Findings

This section contains a discussion of the results and related findings of the study, organized around the five research questions. Results are discussed in reference to previous research, and the extent to which findings in the present study were consistent with those of prior researchers.

## Research Question 1

*What differences exist between AP U.S. History and AP World History examination scores of students who did and did not participate in AP U.S. History and AP World History practice examinations at one urban Florida high school during the 2017-2018 school year?*

Participation rates in AP practice examinations at FHS indicated that 97% percent of students who participated in the AP U.S. History and AP World History examinations also participated in AP practice examinations. The mean score for students who participated in AP U.S. History practice examinations ( $M = 1.84$ ,  $SD = 1.016$ ) out of a possible five-points was higher than the mean score of students who did not participate ( $M = 1.40$ ,  $SD = .894$ ). Additionally, mean AP U.S. History scores by student subgroup indicated that all students who participated in AP U.S. History practice examinations by subgroup had higher mean AP U.S. History examination scores than students of the same subgroup who did not participate in AP U.S. History practice examinations. Similar results were indicated for economically disadvantaged students, as the mean AP U.S. History examination scores of economically disadvantaged students who participated in AP U.S. History examinations was higher than the mean score of economically disadvantaged students who did not participate in AP U.S. History practice examinations.

The mean score for students who participated in AP World History practice examinations ( $M = 1.86$ ,  $SD = .898$ ) out of a possible five-points was higher than the mean score of students who did not participate ( $M = 1.25$ ,  $SD = .500$ ). Mean AP World History examination scores by student subgroup indicated that Asian, Black, Hispanic and White students who participated in AP World History practice examinations had higher mean scores than the scores of students of the same student subgroup who did not

participate in AP World History practice examinations. American Indian and Mixed Race students all participated in AP World History practice examinations. Additionally, both economically disadvantaged and not economically disadvantaged students who participated in AP World History practice examinations had a higher mean score than economically disadvantaged and not economically disadvantaged students who did not participate.

Due to small sample sizes of students who did not participate in AP U.S. History ( $n = 5$ ) and AP World History ( $n = 4$ ) practice examinations, a statistical test was not conducted for Research Question 1. Although a test for statistical significance could not be conducted, it was observed that students who participated in AP practice examinations did outperform those who did not participate by 8% in AP U.S. History and by 12% in AP World History. These findings are consistent with previous research that indicated participation in practice examinations improved examination results (Dotson, Sheldon, & Sherman, 2010; Rowland, 2014; Nip, et al., 2018), particularly when feedback is provided regarding gaps in learning (Pan & Rickard, 2018). Dotson et al. (2010) found that students who participated in practice examinations scored an average of 12% higher on examinations than those who did not participate. Similarly, Nip, Gunter, Herman, Morphew, and West (2018) found that participation in practice examinations resulted in higher mean final examination scores. Results of the current study support existing research indicating that testing, or the use of practice examinations, produces transferrable learning, particularly when practice examinations are similar to final examinations and results are used to provide feedback on what students do and do not know (Pan & Rickard, 2018).



## Research Question 2

*How do AP examination scores of students who participated in AP beyond-school-day tutoring program compare to AP examination scores of students who did not participate in AP beyond-school-day tutoring for AP U.S. History and AP World History at one urban Florida high school during the 2017-2018 school year?*

Of the 184 students who participated in the AP U.S. History examination, 65% chose to participate in AP U.S. History beyond-school-day tutoring. The mean examination score for students who participated in AP U.S. History beyond-school-day tutoring ( $M = 1.87$ ) was slightly higher than the mean score for students who did not participate ( $M = 1.77$ ). Further analysis of participation rates indicated that of the 119 students who chose to participate in AP U.S. History beyond-school-day tutoring, 82% attended three or less sessions. Students who attended four or more sessions ( $M = 2.03$ ) scored higher than those who attended three or fewer sessions ( $M = 1.69$ ). Analysis by student subgroup indicated that the mean AP U.S. History examination score of Asian, American Indian, and White students who participated in AP U.S. History beyond-school-day tutoring was higher than the AP U.S. History examination score of students who did not participate of the same subgroup. Black, Hispanic, and Mixed Race students who participated in AP U.S. History beyond-school-day tutoring had lower mean AP U.S. History examination scores than students of the same student subgroups who did not participate in AP U.S. History beyond-school-day tutoring. Economically disadvantaged and not economically disadvantaged students who participated in AP U.S. History beyond-school-day tutoring both had higher mean AP U.S. History examination scores than economically disadvantaged and not economically disadvantaged students who did not participate in AP U.S. History beyond-school-day tutoring.

Findings from the independent samples t-tests conducted revealed no statistically significant difference in mean examination scores of students who participated and those who did not participate in AP beyond-school-day tutoring for AP U.S. History. A comparison of overall mean scores and mean scores by student subgroup, however, indicated positive effects of participation in AP U.S. History beyond-school-day tutoring. These findings are consistent with previous research that indicated tutoring was effective in some subjects and not others and that only students who attended a requisite number of tutoring hours achieved statistically significant increases in examination scores (Maestre, 2015; Rajadhyax, 2017).

Student participation rates in AP beyond-school-day tutoring for AP World History (40%) were lower than for AP U.S. History (64%). Students who did not participate ( $M = 1.88$ ) had a higher mean score than those who did participate ( $M = 1.85$ ). Asian students who participated in AP World History beyond-school-day tutoring had the same mean AP World History examination score as Asian students who did not participate. All students from other student subgroups (Black, Hispanic, Mixed Race, and White) who participated in AP World History beyond-school-day tutoring had lower mean AP World History examination scores than students of the same subgroups who did not participate. Additionally, both economically disadvantaged and not economically disadvantaged students who participated in AP World History beyond-school-day tutoring had lower mean AP World History examination scores than economically disadvantaged and not economically disadvantaged students who did not participate. Findings from the independent samples t-tests conducted revealed no statistically significant difference in mean examination scores of students who participated and those who did not participate in AP beyond-school-day tutoring for AP World History.

Results regarding the efficacy of AP beyond-school-day tutoring were varied based on subject area in the current research study. Mixed results concerning the efficacy of tutoring to improve student achievement was also reflected in previous research (Munoz et al., 2012; Munoz et al., 2008; Zimmer et al., 2010). Researchers caution that the structure and delivery of tutoring interventions can be integral to program efficacy (Munoz et al., 2012). Design of tutoring interventions can impact outcomes (Rothman & Henderson, 2011). In the current study program design was not prescribed, therefore differences may have existed in how tutoring was delivered in AP U.S. History and AP World History beyond-school-day tutoring.

### Research Question 3

*What is the relationship between the frequency of student participation in AP beyond-school-day tutoring and AP U.S. History and AP World History examination scores in one urban Florida high school, during the 2017-2018 school year?*

Of the 184 students who participated in the AP U.S. History examination, 65% chose to participate in AP U.S. History beyond-school-day tutoring. A total of 13 AP U.S. History beyond-school-day tutoring sessions were offered during the 2017-2018 academic year, following the administration of the AP U.S. History practice examination. Similar to Maestre (2015) and Rajadhyax (2017), the data were further analyzed by number of AP beyond-school-day tutoring sessions attended and resultant mean scores to determine if a threshold existed regarding number of sessions attended and greater increases in AP examination scores of the 119 students who chose to participate in AP U.S. History beyond-school-day tutoring, 50 students (42%) attended one session and 32 students (27%) attended two sessions. Thirty-seven students (31%) attended three or more sessions. A higher mean difference occurred in AP U.S. History beyond-school-day

tutoring between students who attended four sessions ( $M = 2.00$ ) and those who attended six sessions ( $M = 2.86$ ). Of five possible points, the difference in means was a 17% increase in scores. This finding is consistent with previous research indicating a requisite number of tutoring hours in order to positively affect outcome measures (Maestre, 2015; Rajadhyax, 2017). With the exception of one student outlier, mean AP U.S. History scores continued to increase with the number of AP U.S. History beyond-school-day tutoring sessions attended. A comparison of mean scores of students who participated in AP U.S. History beyond-school-day tutoring revealed that students who attended four or more sessions scored 8% higher than those who attended three or fewer. The two students who attended 11 and 13 sessions scored five of five possible points on the AP U.S. History examination. Therefore, it was determined that AP U.S. History beyond-school-day tutoring was an educationally effective way to support student success on AP U.S. History examinations.

Results of the Pearson Correlation conducted indicated that the relationship between number of AP U.S. History beyond-school-day tutoring sessions attended and AP U.S. History examination scores was statistically significant ( $r = .333$ ,  $n = 184$ ,  $p = .000$ ). As frequency of participation in AP U.S. History beyond-school-day tutoring increased so did the mean AP U.S. History examination score.

Of the 122 students who participated in the AP World History examination, 60% chose to participate in AP World History beyond-school-day tutoring. A total of seven AP World History beyond-school-day tutoring sessions were offered during the 2017-2018 academic year, following the administration of the AP World History practice examination. Of the 73 students who participated in AP World History beyond-school-day tutoring, 34 students (46%) participated in one session, 16 students (22%) attended

two sessions, 13 students (18%) attended three sessions, and 9 students (12%) attended four or more sessions. No pattern of increase in AP examination scores could be identified for students who attended AP World History beyond-school-day tutoring.

The results from the Pearson Correlation indicated that the relationship between number of AP beyond-school-day tutoring sessions attended and AP examination scores was not statistically significant for AP World History ( $r = -.024$ ,  $n = 122$ ,  $p = .790$ ). No improvement in AP World History examination scores was identified as a result of participation in AP World History beyond-school-day tutoring.

Findings were consistent with that of Maestre (2015) who found tutoring to be effective in some subjects and not others. One consideration in comparing results from AP U.S. History and AP World History beyond-school-day tutoring was that the largest increases in mean AP U.S. History examination scores occurred after six sessions. AP World History beyond-school-day tutoring offered a total of seven sessions. It is possible that an insufficient number of AP World History beyond-school-day tutoring sessions were offered for gains in AP World History examination scores to be achieved. This possibility would be supported by previous research where a minimum of between 11- 22 hours of tutoring was required before changes in mean scores were achieved (Maestre, 2015; Rajadhyax, 2017).

#### Research Question 4

*How do AP U.S. History and AP World History examination scores compare for the urban Florida high school to be studied (FHS) and a demographically matched high school (MHS) that did not implement AP beyond-school-day tutoring, in one urban Florida school district?*

A comparison of participation rates at FHS ( $N = 184$ ) and MHS ( $N = 56$ ) in the AP U.S. History examination revealed a 70% greater participation rate at FHS. The vast difference in participation in AP U.S. History examination raised questions regarding possible differences in the selection process for student enrollments in AP U.S. History between the two high schools. Despite the difference in participation numbers at FHS and MHS, the mean AP U.S. History examination score at FHS ( $M = 1.83$ ) was higher than the mean score at MHS ( $M = 1.71$ ). Additionally, analysis by student subgroup revealed that mean AP U.S. History examination scores for Asian, Black, American Indian, and White students at FHS were higher than student mean scores in the same subgroups at MHS. Hispanic students at FHS and MHS had the same mean score, however, the participation of Hispanic students at FHS was 70% higher than at MHS. Additionally, economically disadvantaged and not economically disadvantaged students at FHS had higher mean AP U.S. History examination scores than economically disadvantaged and not economically disadvantaged students at MHS.

Although findings from the independent samples t-test comparing mean AP U.S. History examination scores of students at FHS and MHS indicated no statistically significant difference in means, further analysis of the data indicated that students at FHS achieved higher mean AP U.S. History examination scores than students at MHS both overall, and by individual student subgroups. These findings are contrary to previous

research that indicated as the percentage of low-income and minority student increased that examination scores decreased (Wood, 2010), however could be as a result of the support measures provided in the form of AP practice examinations and AP beyond-school-day tutoring. It could be concluded, therefore, that AP U.S. History practice examinations and beyond-school-day tutoring were educationally effective instructional approaches to support the additional students enrolled in AP U.S. History at FHS.

Findings from the independent samples t-tests comparing the mean AP World History examination scores of students at FHS and MHS indicated a negative difference in means for AP World History. The negative difference in means extended to all student subgroups except for Asian students at FHS who had a higher mean AP World History score than Asian student at MHS.

Varying results were obtained regarding the effect of AP beyond-school-day tutoring between AP U.S. History and AP World History at FHS, which raises questions regarding the structure and content of tutoring opportunities provided. Structure and content of AP beyond-school day tutoring opportunities provided at FHS was not prescribed or monitored. Rothman and Henderson (2011) identified tutoring program elements that, when used collectively, resulted in statistically significant student outcome measures: (a) teacher tutors selected based on classroom effectiveness; (b) small teacher-student ratios; (c) communication between classroom teachers and tutors; and (d) student incentives for attendance.

## Research Question 5

*How do AP U.S. History and AP World History examination results for the 2017-2018 school year compare to AP U.S. History and AP World History examination results from the 2016-2017 school year, prior to implementation of AP practice examinations and AP beyond-school-day tutoring for the same urban Florida high school?*

Participation in AP U.S. History examinations increased between the 2016-2017 school years at FHS. Participation in AP U.S. History for the 2017-2018 academic year ( $n = 184$ ) increased 43% from the 2016-2017 academic year ( $n = 129$ ).

The mean AP U.S. History examination score decreased slightly between the 2016-2017 and 2017-2018 academic years ( $M_{2016-2017} = 1.91$ ,  $M_{2017-2018} = 1.83$ ). Results by student subgroups indicated that while participation by Asian students remained the same for the 2016-2017 and 2017-2018 academic years, mean score on the AP U.S. History examination increased ( $M_{2016-2017} = 1.92$ ,  $M_{2017-2018} = 2.08$ ). Participation by Black students in the AP U.S. History examination at FHS doubled during the 2017-2018 academic year and mean AP U.S. History score increased ( $M_{2016-2017} = 1.92$ ,  $M_{2017-2018} = 2.08$ ). This is contrary to the findings of Wood's (2010) study which indicated that as the percentage of minority students participating in AP examinations increased, examination scores decreased. While mean AP U.S. History examination score for Hispanic students decreased between the 2016-2017 and 2017-2018 academic years, participation increased by 53%. Mean examination results and participation rates by White students at FHS remained stable from the 2016-2017 to the 2017-2018 academic years. Finally, while participation in the AP U.S. History examination by economically disadvantaged students at FHS increased by 155% between the 2016-2017 academic years, mean AP U.S. History examination scores increased ( $M_{2016-2017} = 1.74$ ,  $M_{2017-2018} = 1.80$ ).



Although findings from the independent samples t-tests comparing mean AP U.S. History examination scores of students at FHS from the 2016-2017 and 2017-2018 academic years indicated no statistically significant difference in means, the number of students enrolled in AP U.S. History at FHS increased by 43% between the 2016-2017 and 2017-2018 academic years. A comparison of means while considering the increase in participation rates could indicate that AP U.S. History practice examinations and beyond-school-day tutoring were effective instructional strategies in supporting students who participated in AP U.S. History examinations at FHS for the 2017-2018 academic year.

Participation in the AP World History examination at FHS increased from  $n = 67$  student during the 2016-2017 academic year to  $n = 122$  students during the 2017-2018 academic year, an increase of 82%. Participation by Asian, Black and Hispanic students increased at FHS during the 2017-2018 academic year by more than 100% for each student subgroup participating in the AP World History examination, yet mean AP World History examination scores for all three subgroups increased. Additionally, while participation by economically disadvantaged students during the 2017-2018 academic year increased by 130% over the previous year, mean AP World History examination results also increased ( $M_{2016-2017} = 1.76$ ,  $M_{2017-2018} = 1.88$ ). This is also contrary to findings from Wood (2010) that indicated that as increased numbers of low-income and minority students participated in AP examinations, AP examination scores decreased. Results, therefore, indicate that AP World History practice examinations and beyond-school-day tutoring were effective instructional approaches to support students participating in AP World History examinations, particularly minority and economically disadvantaged students. Wood (2010) indicated that as increased numbers of low-income

and minority students are enrolled in AP programs, passing rates on AP examinations typically decreased and recommended that support measures need to be put in place to ensure student success. It would appear that AP beyond-school-day tutoring was an educationally effective method of supporting low-income and minority students participating in the AP U.S. History and AP World History examinations for the 2017-2018 academic year.

### Conclusions

The growth of AP programs in the state of Florida (College Board, 2017) has been due, in part, to acceleration points earned by schools toward school grades based on participation and performance on AP examinations (FDOE, 2017). Incentive for schools to increase student success on AP examinations is provided by the inclusion of college and career readiness measures in the calculation of school grade, one of which is scoring a three or greater, on a five-point scale, of AP examinations (FDOE, 2018). Continued growth of the AP program has resulted in a greater need to find ways to support students enrolled in AP courses and to increase student success rates on AP examinations (Wood, 2010).

### Implications for Policy and Practice

The results of this research study have implications for policy and practice as the results provide school and school district administrators with the evidence on how to best support all students as they attempt to succeed in accelerated coursework. The following implications should be considered when designing and implementing instructional supports for students participating in AP courses and examinations:

1. School-district level leaders may want to consider designing a program which provides a system of supports for students enrolled in AP courses, including AP

- practice examinations and AP beyond-school-day tutoring, to increase student success on AP examinations.
2. Consideration should be given to broadening the structure and implementation of the AP beyond-school-day tutoring program. In the current study, AP practice examinations were administered at the beginning of April and AP beyond-school-day tutoring occurred during the four weeks following the AP practice examinations. AP beyond-school-day tutoring could be designed to extend throughout the academic year, such that formative assessments are administered at the end of each quarter with AP beyond-school-day tutoring after each formative assessment. This would give students time to address gaps in learning as they arise.
  3. School level leaders may want to consider the structure of AP beyond-school-day tutoring programs, ensuring that AP practice examination results are used to guide AP beyond-school day tutoring opportunities and ensure that AP teachers are attending to gaps in learning.
  4. A full-length AP practice examination should still be administered prior to AP examinations with time following for AP teachers to address learning deficits. Structuring AP beyond-school-day tutoring in this manner would allow for the formation of a continuous feedback loop as recommended by Hattie (2009), whereby formative assessments inform tutoring content.
  5. An adequate support system needs to be instituted in order to accommodate increased numbers of students participating in AP examinations to ensure the success of all students. Thus, implications of this research study are applicable to

- not only educational leaders and state legislators, but to current and future students interested in participating in AP courses.
6. School level leaders may want to consider AP teacher selection when implementing AP beyond-school-day tutoring programs to ensure that the most effective AP teachers are chosen to deliver tutoring opportunities.
  7. Attention should be given to ensuring consistent practices within and between schools regarding the criteria for student enrollment in AP coursework and participation in AP examinations.

#### Recommendations for Further Research

The goal of this study was to investigate the efficacy of AP practice examinations and AP beyond-school-day tutoring in improving AP U.S. History and AP World History examination scores. Five research questions were identified related to this goal and data were collected to respond to the five research questions. Although significant findings were discovered, limitations were also identified. The current study focused on AP practice examinations and AP beyond-school-day tutoring for AP U.S. History and AP World History courses at one Florida high school. Future research should focus on:

1. Replicating the current study with a larger sample population of AP students who do and do not participate in the instructional approaches of AP practice examinations and AP beyond-school-day tutoring in order to eliminate the potential effects of individual AP teacher efficacy and so that statistical analysis of the effect AP practice examinations can be analyzed.
2. Replicate the current study with a focus on examining the structure and content of AP beyond-school-day tutoring services provided to determine

optimal program design features which result in increased student success on AP examinations.

3. Replicating the current study using matched samples of students, based on grade level, prior GPA, previous examination scores, who do and do not participate in AP practice examinations and AP beyond-school-day tutoring.
4. Replicating the current study while expanding the number of AP courses to be studied to include all subject areas and courses offered by College Board.
5. Examining the efficacy of AP practice examinations and AP beyond-school-day tutoring when implemented throughout the entire academic year, using the results of quarterly AP practice examinations to guide ongoing AP beyond-school-day tutoring opportunities.

#### Summary

The findings of this study expanded upon previous research on the efficacy of tutoring and practice examinations in improving student outcome measures, extending the research to include the efficacy of the instructional approaches in supporting students enrolled in AP courses. Although a statistical test was not conducted examining the efficacy of AP practice examinations, analysis of differences in mean AP examination scores identified mean differences that support conclusions regarding the efficacy of the instructional approach to supporting students participating in AP examinations.

Additionally, this investigation revealed promising results regarding the efficacy of AP beyond-school-day tutoring in improving student AP examination scores, particularly with respect to economically disadvantaged and minority students. Participation in AP U.S. History beyond-school-day tutoring was significantly correlated to improvements in AP U.S. History examination scores. Additionally, despite increases in enrollment in

both AP U.S. History and AP World History at the school of study, mean AP examination scores remained relatively stable. Furthermore, despite the school of study (FHS) having enrolled 70% more students in AP U.S. History than did the matched high school (MHS), the mean AP U.S. History examination score at FHS was higher than that of MHS.

Although participation in AP examinations has continued to rise in Florida (College Board, 2017) and legislation within the state has encouraged all students to participate in a minimum of one AP examination while in high school [(FLA. STAT. § 1007.27 (5) (2018)], educational leaders are in need of ways to effectively support all students participating in AP examinations (Wood, 2010). Researchers have reported that the more often students are tested and receive feedback, the better they perform on summative assessments (Rowland, 2014). Rothman and Henderson (2011) observed that when tutoring opportunities were designed and implemented with fidelity, they resulted in significant improvements in student outcome measures. The two instructional strategies considered in the present study, practice examinations and beyond-school-day tutoring, implemented together in the form of a continuous feedback loop (Hattie, 2009), have the potential to successfully increase participation in AP coursework and performance on AP examinations.

APPENDIX  
UCF INSTITUTIONAL REVIEW BOARD APPROVAL



University of Central Florida Institutional Review Board  
Office of Research & Commercialization  
12201 Research Parkway, Suite 501  
Orlando, Florida 32826-3246  
Telephone: 407-823-2901, 407-882-2012 or 407-882-2276  
[www.research.ucf.edu/compliance/irb.html](http://www.research.ucf.edu/compliance/irb.html)

**NOT HUMAN RESEARCH DETERMINATION**

**From:** UCF Institutional Review Board #1  
FWA00000351, IRB00001138  
**To:** Sabine Laser and Co-PI Rosemarye T Taylor  
**Date:** August 13, 2018

Dear Researcher:

On 08/13/2018, the IRB determined that the following proposed activity is not human research as defined by DHHS regulations at 45 CFR 46 or FDA regulations at 21 CFR 50/56:

Type of Review: Not Human Research Determination  
Project Title: A CASE STUDY OF APPROACHES TO IMPROVE  
STUDENT PERFORMANCE ON ADVANCED  
PLACEMENT SOCIAL STUDIES EXAMINATIONS IN  
ONE URBAN CENTRAL FLORIDA HIGH SCHOOL  
Investigator: Sabine Laser  
IRB ID: SBE-18-14213  
Funding Agency:  
Grant Title:  
Research ID: N/A

University of Central Florida IRB review and approval is not required. This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are to be made and there are questions about whether these activities are research involving human subjects, please contact the IRB office to discuss the proposed changes.

This letter is signed by:

Signature applied by Renca C Carver on 08/13/2018 11:44:21 AM EDT

Designated Reviewer



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