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# Advanced Placement and Dual Enrollment as Related to College Readiness and Retention at a Tennessee University

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# ADVANCED PLACEMENT AND DUAL ENROLLMENT AS RELATED TO COLLEGE READINESS AND RETENTION AT A TENNESSEE UNIVERSITY

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## ABSTRACT

*The purpose of this study was to determine if there was a significant relationship between students who entered a Tennessee university for the first time in the fall of 2014 who had earned either Advanced Placement (AP) or dual enrollment credit and their college readiness and 1-year college retention. College readiness was defined by students' American College Testing (ACT) sub scores in English, reading, and mathematics. The Tennessee Board of Regents (TBR) regulates the minimum sub score for each sub section that a student must obtain to be college ready. College retention was defined by students who enrolled at the university in the fall of 2014 and reenrolled in the fall of 2015 at the same university.*

*The independent variables for this study were AP credits received in AP English Language and Composition, AP English Literature and Composition, AP Statistics, AP Calculus AB, AP Calculus BC, and dual enrollment credit received in any course. The dependent variables for this study were college readiness as defined by TBR and fall-to-fall retention. A series of chi-square tests of independence was performed to examine the differences in college readiness and fall-to-fall retention between students who had earned AP or dual enrollment credit and those students who had not.*

*The quantitative findings revealed that there is a significant relationship between students who enroll in their first college year with AP English or math credit or dual enrollment credit and first year retention rates when compared to students who do not reenroll with AP English or math credit or dual enrollment credit. The results indicated there was no difference in students who enrolled with AP English or math credit and students who enrolled with dual enrollment credit regarding their fall-to-fall retention rates. AP English credit increased the likelihood that a student was college ready in both English and reading based on TBR determinations of college readiness. Credit in an AP mathematics course also increased the likelihood that a student was college ready in math based on TBR determinations of college readiness.*

## INTRODUCTION

Graduating from high school ready for college is now more important than ever. Fewer than 60% of Tennessee high school graduates enroll in a postsecondary institution the fall following their high school graduation because they do not feel prepared (Karp, 2013). The majority of postsecondary institutions determine College readiness by American College Test (ACT) scores. The ACT is a standardized test consisting of 215 multiple-choice questions that is limited to 2 hours and 55 minutes. The test is broken down into four sub sections that cover math, English, reading, and science. The test has a composite

score ranging from 0 to 36 and each sub section is scored within the same range (ACT, 2016). Tennessee Board of Regents (TBR) schools have set a minimum ACT score for each sub section that a student must reach to be college ready: writing 18, reading 19, and mathematics 19; science requires no minimum sub score (Tennessee Board of Regents (TBR), 2014). In the fall of 2014, 33% of TBR university freshmen who enrolled did not reach all three of these benchmarks (Wilson, 2016).

According to the National Center for Educational Statistics (NCES), first year college retention rates are among

one of the strongest indicators for a student's probability of finishing the postsecondary degree that they have set out to obtain (Kena et al., 2016). The average for college retention at a 4-year institution varies with their selectivity of students. For first time, enrolling freshman in the fall of 2014 at highly selective schools, the retention rate was 93%; at schools labeled as open selection, the retention rate was 56%. The national average for all schools was 73.1% (ACT, 2015b). The likelihood of obtaining a degree decreases for students who do not reenroll for a second year at their postsecondary institution, even for those who were college ready when they entered.

Advanced Placement (AP) courses have shown to positively affect students attending a 4-year college or university regarding college readiness, an increase in second year college retention, and graduation rates (Shaw, Marini, & Mattern, 2013). The College Board oversees the AP program. AP courses have been offered in high schools across the United States since 1955, giving students the opportunity to take rigorous college level courses while still in high school. In 2013, 1.1 million AP exams were administered to 607,505 students (The College Board, 2014). The exam is scored on a 5-point scale with 5 being the highest score awarded. Most postsecondary institutions grant college credit for a score of three or higher (Dodds, Fitzpatrick, De Ayala, & Jennings, 2002).

Dual enrollment courses are another way for high school students to obtain college credit for many courses including the core courses required for many college majors (Ganzert, 2014). Students take college level courses while still in high school and receive both high school and college credit (Karp, 2013). Dual enrollment students have been found to be more emotionally and behaviorally prepared for the transition from high school to college compared to non dual enrollment students (Karp, 2015). Students who take dual enrollment courses have shown to be more likely to earn their college degree, are two times more likely to reenroll for their second year, and are 12% more likely to enroll in a postsecondary school within 7 months of their high school graduation (Adelman, 2006; O'Brien & Nelson, 2004; Struhl & Vargas, 2012). This study was designed to determine if certain AP courses positively affect college readiness and if certain AP or dual enrollment courses positively affect college retention.

### PURPOSE

The purpose of this study was to determine if there was a significant relationship between students who entered a Tennessee university for the first time in the fall of 2014 who had earned either Advanced Placement (AP) or dual enrollment credit and their college readiness and 1-year

college retention. College readiness was defined by students' American College Testing (ACT) sub scores in English, reading, and mathematics.

Most studies regarding AP and dual enrollment students were not conducted in southern states; and therefore, confirm the need for this research. This study was conducted at a 4-year university in Tennessee that is governed by the TBR. The university has a lower retention rate (69%) for first time freshmen than the national average (73%) and more than half of the incoming freshmen are deemed not college ready in math (Dula, 2015; NCES, 2016). This study focused on the effects that AP and dual enrollment courses had on college readiness as defined by the TBR and fall-to-fall retention. A quantitative, quasi experimental, comparative design was used to analyze secondary data to determine if AP courses had an effect on college readiness and if AP and dual enrollment courses had an effect on fall-to-fall retention in a student's first year.

### RESEARCH QUESTIONS

Seven research questions guided the study.

- RQ1: Is there a significant difference in the fall-to-fall retention rates between students who did not receive AP credit in a mathematics class (AP Statistics, AP Calculus AB, or AP Calculus BC) and students who did receive AP credit in a mathematics class?
- RQ2: Is there a significant difference in the fall-to-fall retention rates between students who did not receive AP credit in an English class (AP English Language and Composition or AP English Literature and Composition) and students who did receive AP credit in an English class?
- RQ3: Is there a significant difference in the fall-to-fall retention rates between students who did not receive a dual enrollment credit in any course and students who did enter with a dual enrollment credit?
- RQ4: Is there a significant difference in the fall-to-fall retention rates between students who received dual enrollment credit and students who received AP credit in English or mathematics?

- RQ5: Is there a significant difference in college readiness in English between students who did not receive AP English credit and those who did receive AP English credit?
- RQ6: Is there a significant difference in college readiness in reading between students who did not receive AP English credit and those who did receive AP English credit?
- RQ7: Is there a significant difference in college readiness in math between students who did not receive AP mathematics credit and those who did receive AP mathematics credit?

### POPULATION

Participants in this study included incoming freshmen who enrolled at the university in the fall of 2014. Of those, 80% were in-state residents and 20% were out-of-state residents. The average high school GPA for the incoming freshman class in the fall of 2014 was 3.4; their average ACT composite score was 22.3. Participants included 43% males and 57% females. The class demographics included 83% White, 6% Black or African American, 2% Hispanic/Latino, 3% nonresident alien, 2% two or more races, 1% Asian, and 1% race/ethnicity unknown. For the incoming freshman class in the fall of 2014, each member of the population was grouped into one or more of four categories (ETSU, 2015):

1. The students who entered with an AP mathematics credit,
2. students who entered with an AP English credit,
3. students who entered with a dual enrollment credit, and
4. students who entered with neither AP or dual enrollment credit.

The population was also categorized into two other distinct groups: those who reenrolled and attended a Tennessee university in the fall of 2015 and those who did not.

### INSTRUMENTATION

The instrument used to measure college readings in this study was the ACT in math, English, and reading. Jaschik (2011) reported that ACT math and English sub scores were highly predictive of college readiness while science and reading sub scores were not. This study excluded science sub scores because ACT science sub scores are not

linked to the college readiness standards used by TBR institutions, however ACT reading sub scores were used because of their use in the determination of students' college readiness. Each sub score has a range of 0 to 36. TBR schools have set minimum sub scores for math, English, and reading that a student must obtain to be college ready. Those sub scores are 18 for writing, 19 for reading, and 19 for mathematics (TBR, 2014). Standardized test scores like the ACT have been found to be more reliable than a student's high school GPA when trying to predict college readiness (Allen et al., 2008). Because high school GPAs have been on a steady rise since 1990, it has been argued that with their steady increase they have been rendered useless (Woodruff & Ziomek, 2004).

### DATA COLLECTION

The Office of Institutional Research Applications provided data for analysis. The data used in this study were existing data in the university's student information system:

The students who entered as first time freshmen in the fall of 2014 with an AP credit in AP Statistics, AP Calculus AB, AP Calculus BC, AP Literature and Composition, and AP Language and Composition;

1. students who entered with a dual enrollment credit in any course;
2. students who obtained the following ACT sub score thresholds: reading greater than 18, English greater than 17, and math greater than 18; and
3. students who reenrolled in the Fall of 2015.

The data were provided by the university and retrieved from the Office of Institutional Research Applications. A director of Institutional Research Applications removed all personal identifiers from the data before the researcher obtained the data to insure confidentiality for all participants. The director made the data confidential by assigning a randomly generated identification code that bore no relation to the participant in any way. No other data about the participants were collected from the university's Office of Institutional Research Applications.

### DATA ANALYSIS

Each research question was analyzed using a chi-square test of independence. The chi-square test was an appropriate statistical measure because all data are nominal. More specifically two-way contingency tables were used for the seven research questions. All data were analyzed at the 0.05 level of significance. The independent variables

for this study were AP credits received in AP English Language and Composition, AP English Literature and Composition, AP Statistics, AP Calculus AB, AP Calculus BC, and dual enrollment credit received in any course. The dependent variables for this study were college readiness as defined by TBR and fall-to-fall retention.

### DISCUSSION AND CONCLUSIONS

Research questions 1, 2, and 3 focused on fall-to-fall retention rates for students who enrolled for the first time in the fall of 2014 with AP mathematics, AP English, or dual enrollment credit. The population for research questions 1, 2, and 3 was 2,055. Table 1 contains the results.

Course Type	Fall-to-Fall Retention in 2015	
	Yes	No
AP Math	89.86%	10.14%
No AP Math	70.29%	29.71%
AP English	90.38%	9.62%
No AP English	69.91%	30.09%
Dual Enrollment	87.21%	12.79%
No Dual Enrollment	70.24%	29.76%

Students who enroll with AP mathematics, AP English, or dual enrollment credit were significantly more likely to reenroll than students who did not enroll with credit. Students who enrolled with AP math credit were 19.57% more likely to reenroll than students who did not enroll with AP math credit. Students who enrolled with AP English credit were 20.47% more likely to reenroll than students who did not enroll with AP English credit. Students who enrolled with dual enrollment credit were 16.97% more likely to reenroll than students who did not enroll with dual enrollment credit.

Research question 4 focused on fall-to-fall retention rates for students who enrolled with AP English or math credit versus students who enrolled with dual enrollment credit. The sample size for this research question was much smaller than the other six research questions with a population of 209. Results show that students who enrolled with AP credit in English or math were not more likely to reenroll than students who enrolled with dual enrollment credit. Table 2 contains these results. Students who enrolled with

AP English or math credit were only 3.6% more likely to reenroll than students who reenrolled with dual enrollment credit; this is not a statistically significant difference.

Course Type	Fall-to-Fall Retention in 2015	
	Yes	No
AP Math or AP English	88.32%	11.68%
Dual Enrollment	84.72%	15.68%

Research questions 5, 6, and 7 focused on college readiness as defined by the TBR for students who enrolled for the first time in the fall of 2014 with either AP mathematics or AP English credit. Students who enrolled with AP English credit were significantly more likely to be college ready in both English and reading than students who did not enroll with AP English credit. They were 19.73% more likely to be college ready in English and 6.27% more likely to be college ready in reading than students who did not enroll with AP English credit. Table 3 contains the results.

English College Ready	Enrolled with AP English Credit	
	Yes	No
Yes	100%	80.27%
No	0%	19.73%
Reading College Ready	Yes	No
	Yes	100%
No	0%	6.27%

Students who enrolled with AP math credit were significantly more likely to be college ready in math than students who did not enroll with AP math credit. They were 33.43% more likely to be college ready in math than students who did not enroll with AP math credit. Table 4 contains the results.

	Enrolled with AP Mathematics Credit	
Mathematics College Ready	Yes	No
Yes	100%	66.57%
No	0%	33.43%

The researchers found that AP English, AP math, and dual enrollment credits increase first year fall-to-fall college retention. There was not a significant difference between the first year retention rates of students who enroll with AP English or math credit and students who enroll with dual enrollment credit and first year retention rates. Credit in AP English increases the chance a student will be English college ready and credit in AP mathematics increases the chance a student will be college ready in mathematics.

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