KENTUCKY COMMUNITY & TECHNICAL COLLEGE SYSTEM

Research Brief

Research Review: KCTCS and CPE Dual Credit/Dual Enrollment Research Studies Show Promising Results for Kentucky Students and Institutions

The role of community and technical colleges has expanded greatly over the past two decades with more emphasis on affordable, accessible, and targeted education designed to prepare students for the workforce or transfer to four-year institutions. Among the growing strategies for achieving the mission of community and technical colleges are dual credit and dual enrollment programs (DC/DE) that offer early access to college education for high school students. DC/DE programs are geared toward improving outcomes among high school students by providing cheaper and earlier exposure to courses that provide direct workforce training, prepare students to enter college, and give high school students the college experience. A central goal of practically every DC/DE program is increasing the number of students who matriculate and earn credentials at the postsecondary level.

DC/DE has been of growing interest among leaders within higher education due to the substantial opportunity for colleges to increase enrollment and produce innovative strategies in response to post-recession enrollment challenges. According to research from the Community College Research Center at Columbia University, more than one million high school students take college courses annually and this number continues to grow as DC/DE programs are introduced or expanded (Fink, Jenkins, & Yanagiura, 2017). While continued growth in dual credit and dual enrollment education is expected in the future, little is known about the factors that improve the likelihood that high school students will matriculate, perform well in college, and eventually earn a credential. Recent independent research studies produced by the Kentucky Community and Technical College System (KCTCS) and the Council on Postsecondary Education (CPE) explore these issues by investigating the impact of various conditions on DC/DE student success. The purpose of this research brief is to describe and explore the results of these studies, and to shed light on the promising results for Kentucky's students and institutions.

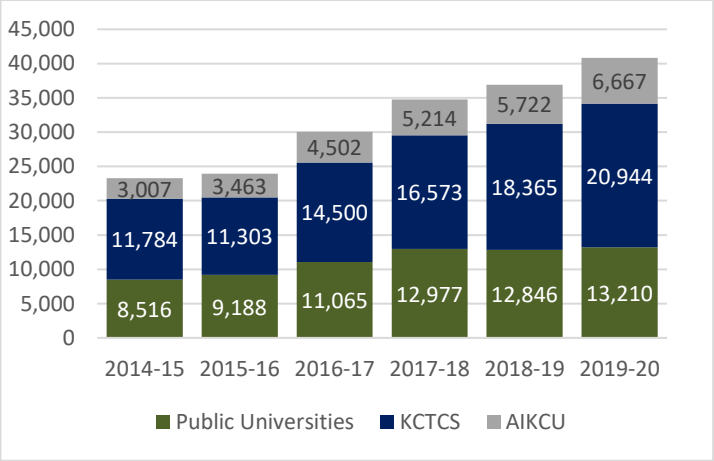
The first study by KCTCS was completed in December of 2019 and examined the evolution of DC/DE over time and the impact of various conditions on the likelihood of high school students to matriculate to credential-seeking at KCTCS, earn a credential, and transfer to four-year institutions. The main objective of the KCTCS study was to investigate the effects of predictors that were hypothesized to have a significant influence on student success. The second study was produced by CPE in August of 2020 and is limited to first-time, full-time students at Kentucky's public four-year universities. The study used statistical analysis to examine the effects of dual credit participation on persistence and GPA. The main objective of the CPE study was to determine if dual credit participation leads to better outcomes for high school students when compared to a control group that did not participate in dual credit education.

While the KCTCS and CPE studies utilized different sampling and analytic techniques, both provide valuable insights into DC/DE education in Kentucky. Both studies highlight the important benefits that DC/DE provides high school students, including access to challenging courses, increasing college enrollment, increasing persistence, shortening the length of time to a credential, reducing tuition costs, and improving outcomes for traditionally underrepresented and/or disadvantaged populations. Many colleges throughout the country report that DC/DE programs provide a valuable service to the community in terms of early college access, but it also presents a significant financial challenge due to the need to deliver high quality college courses at reduced costs. While the literature on the impact of DC/DE programs is limited, it is clear that many colleges view DC/DE as a method for preparing high school students for college and a recruitment tool designed to encourage high school students to continue their education as traditional credential-seeking students. The KCTCS and CPE studies provide new evidence for the efficacy of dual credit as a program to promote higher education in Kentucky.

Background of the Research Studies

Across the United States, there is wide variation in the implementation of DC/DE programs, but every state has some form of early college education available to its high school population. In 2016, CPE established a dual credit policy advising that high school students have enhanced access to quality general education and technical courses at the postsecondary level (CPE, 2020). Additionally, the Kentucky Dual Credit Scholarship program helps high school students by reducing the tuition of courses and eliminating additional costs including lab, equipment, and admission/application fees. These recent efforts have resulted in increases in high school enrollment at KCTCS, with total enrollment now equivalent to the numbers seen prior to and during the recession. Figure 1 shows that the total number of dual credit students in the state has steadily increased in recent years. KCTCS has the largest portion of the total dual credit student population, but public universities have recently started to enroll a larger proportion from this population.

Figure 1: Dual Credit Enrollment in Kentucky by Institution Type



The recent growth in high school enrollment in Kentucky has given rise to important questions about outcomes for high school students enrolled in college courses. Some important outcomes that higher education leadership focuses on are matriculation to college after high school, performance while in college, and earning credentials. DC/DE is viewed as an investment that simultaneously improves access to college and attachment and belonging to the host institution. By improving access to college, the expectation is that more students will choose to enroll after high school graduation, more will perform better while in college, and more will earn college credentials, which benefits not only students and colleges, but also the state's economic viability.

While DC/DE programs have been in existence for more than three decades, few studies have investigated the impact of these programs on student outcomes. The current body of literature exploring the impact of DC/DE on student outcomes have used a variety of methodological procedures on a limited number of samples. As DC/DE policies develop, a key concern is whether DC/DE programs lead to improved outcomes for students. The small amount of evidence that exists regarding the effectiveness of dual credit and dual enrollment education generally confirms that it is an effective strategy for improving numerous outcomes of interest.

One area of research on the outcomes of dual credit and dual enrollment students is comparing the performance with students who participate in other forms of early college access. Speroni (2011) compared outcomes of student who utilized Advanced Placement (AP) with outcomes of students who participated in dual credit and found that both are associated with positive outcomes. Wang, Chan, Phelps, and Washbon (2015) found dual credit enrollment was associated with more attempted credits, higher likelihood of college entry without delay, summer enrollment, and stronger academic performance. Phelps and Chan (2016) found dual credit students had significantly better outcomes than non-dual credit students in terms of college course completion rates, second year retention, three-year graduation rates, and earnings. Radunzel, Noble, and Wheeler (2014) found dual credit students were more likely to be successful in college, including completing credentials in a timely manner. Their study also found that dual credit students who took their courses at 2-year institutions are just as likely as dual credit students who took their courses at 4-year institutions to achieve success while in college. The research on the impact of dual credit and dual enrollment education is only now in its infancy and more research is needed to discover how these programs impact students.

The graphics on page 3 highlight the research design of the KCTCS and CPE studies. The studies have similar features but are designed to answer different questions about DC/DE. The KCTCS study explores predictors of student outcomes, while the CPE study specifically focuses on the benefits of student participation in dual credit education.

KCTCS and CPE Study Designs

KCTCS Study

Title: *KCTCS Dual Credit & Dual Enrolment Students: A Look at Enrollment Trends, Demographics, Student Success, and Outcomes*

Completed: December - 2019

Sample: All KCTCS senior high school students who enrolled in at least one course with KCTCS between the years 2012 and 2018.

Sample Size: 49,704

Dependent Variables:

1. Matriculation to Credential-Seeking at KCTCS
2. Matriculation Program (Gen Ed vs. Technical)
3. Earned Credential
4. Credential Type (Gen Ed vs. Technical)
5. Transfer
6. Matriculated then Transferred
7. Matriculated, Earned Credential, and then Transferred

Independent Variables:

1. Gender
2. Underrepresented Minority (URM) Status
3. Course Location
4. Course Modality
5. Course Type
6. Courses Passed
7. Low-Income
8. Academic Preparation

Analytic Strategy:

1. Logistic Regression

Central Research Objective:

1. What variables predict student success outcomes among KCTCS high school students?

CPE Study

Title: *Dual Credit & Student Success: The Effect of High School Dual Credit on Educational Outcomes at Kentucky Public Universities*

Completed: August - 2020

Sample: Students who graduated from a Kentucky high school and enrolled full-time at an in-state, four-year public institution for the first time during the fall of 2014, 2015, 2016, and 2017.

Sample Size: 51,995

Dependent Variables:

1. Second-Year Persistence
2. First-year GPA

Independent Variables:

1. Dual Credit Participation
2. Gender
3. Income
4. URM Status
5. Academic Preparation
6. Institution

Analytic Strategy:

1. Logistic Regression
2. Propensity Score Matching to Establish a Control Group

Central Research Objective:

1. Does dual credit participation lead to better outcomes for students when compared to a control group who did not participate?

Note: Links to the KCTCS and CPE studies are provided by clicking on the study title in the graphics above.

Key Findings from the KCTCS and CPE Studies

KCTCS Study

- Being female increases the odds of matriculating, earning credentials, and transferring. Additionally, females are less likely to matriculate to technical programs when compared to males but are more likely to earn technical credentials.
- Dual credit and dual enrollment education had a positive effect on URM outcomes, but URM students lagged behind non-URM students in terms of matriculation, credential completion, and transferring to four-year institutions.
- The location of courses had a significant impact on many of the dependent variables, but not all. Taking courses exclusively at a KCTCS location or at mixture of KCTCS and high school locations generally increased the odds of matriculating and earning credentials when compared to taking courses exclusively at a high school.
- Online courses increase the likelihood of matriculating and earning credentials. Mixed course modalities generally have weak effects on the dependent variables.
- The type of courses taken by students significantly impacts matriculation and credential earning outcomes. Taking technical courses increases the odds of matriculation, but taking GenEd courses decrease the odds of matriculation.
- Passing courses increases the odds of earning a credential in both technical and GenEd programs, but does not significantly influence matriculation rates.
- Low-income students are more likely to earn a credential when compared to non-low-income students. Low-income students are more likely to earn a technical credential and less likely to earn a GenEd credential when compared to non-low-income students.

CPE Study

- Dual credit participants were more likely to persist to the second year of college than students who did not participate in dual credit.
- Dual credit participants were more likely to obtain a first-year GPA of 3.0 or higher (on a 4.0 scale) than students who did not participate in dual credit.
- Participation in dual credit had a stronger effect on the grades of students with lower first-year GPAs than those with higher GPAs.
- Dual credit had a greater effect on the second-year persistence of females than of males
- Prepared dual credit participants were more likely to persist to a second year of college than prepared non-participants.
- Dual credit had a slightly greater effect on the second-year persistence of underrepresented minority students than of white and Asian students.
- Dual credit had a greater effect on the first-year GPA of male students than of female students.
- Prepared dual credit participants were more likely to earn a 3.0 GPA or higher than prepared non-participants.
- Dual credit's effect on the likelihood of earning a first-year GPA of 3.0 or higher was greater for low-income students than for higher income students.
- Dual credit's effect on the likelihood of earning a first-year GPA of 3.0 or higher was greater for white and Asian students than for underrepresented minority students.
- The largest effect of dual credit participation for both persisting to a second year of college and earning a first-year GPA of 3.0 or higher was for non-minority low-income students.

Conclusions, Implications, and Recommendations

The KCTCS and CPE studies show dual credit has a positive influence on students and institutions. The results of the two studies have several important implications for future research and policy. The results of the KCTCS study showed dual credit and dual enrollment education lead to positive outcomes for KCTCS high school students, including higher matriculation and credential completion rates. Dual credit and dual enrollment education had a positive effect on URM outcomes, but URM students lagged behind non-URM students in terms of matriculation, credential completion, and transferring to four-year institutions. Gender, race/ethnicity, course location, course modality, course type, and course success all play an important role in the success and outcomes of KCTCS high school students. The results of the CPE study showed dual credit participation positively influenced second-year persistence and GPA. The impact of dual credit participation varied across subgroup categories, including gender, URM status, academic preparation, and low-income.

The results of KCTCS and CPE studies lead to important recommendations about the future of dual credit education. A key implication from the KCTCS study is that attachment to KCTCS and exposure to the "college experience" were important indicators of success for KCTCS high school students. Efforts to improve the overall experience for high school students enrolled at KCTCS should focus on creating more opportunities for students to take courses at a KCTCS campus. The results of both studies suggest that more research is needed to understand the underlying mechanisms producing differences in effects across subgroups. More research is needed explain differences by gender, race/ethnicity, and course taking characteristics. Finally, the CPE study offered several recommendations, including more outreach for middle and high school students to inform them about the availability of dual credit. Ensuring dual credit is accessible at local high schools during the school day and providing additional financial assistance for low-income students.

While the KCTCS and CPE studies are both in-depth, and CPE plans to release an additional study in Fall 2020 focusing on KCTCS specifically, more research is needed to continue to improve upon limitations. Future research should continue to expand the demographic, social, and economic variables that might impact dual credit student outcomes. Future studies should also look to take advantage of the temporal and spatial dimensions of dual credit data by looking at how dual credit has changed over time and how geographic conditions may influence statistical models. Finally, future research should consider the potential benefits of conducting surveys, in-depth interviews, and focus groups with students. This research may provide additional insights into the mechanisms that produce differences in outcomes for dual credit students, and may lead to an improved theoretical understanding of dual credit education in Kentucky. While future studies will continue to advance the understanding of DC/DE education, the studies presented in this research brief point to many positive outcomes for DC/DE students, and suggest continued investment in DC/DE education will produce positive results for students, institutions, and Kentucky.

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