

DUAL CREDIT PROGRAMS: A CONCEPTUAL ANALYSIS OF THE LITERATURE

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ABSTRACT

In this article, we conducted a literature review to examine the history of dual credit starting with reasons for its inception, relevant policy changes, student enrollment status, and new initiatives in dual credit. In addition, we compared and contrasted dual credit with other high school programs in which opportunities for college credit are made available for students. Furthermore, we analyzed literature on dual credit standards for enrollment, standards, participation, and teacher qualifications. Finally, the efficacy of dual credit programs in increasing student preparedness, GPA, and college GPA was examined. Given the increase in dual credit programs across the United States, the information provided herein provides an understanding for its increased use.

Keywords: dual credit, community college, GPA, effectiveness

DUAL CREDIT PROGRAMS: A CONCEPTUAL ANALYSIS OF THE LITERATURE

Many factors can affect increases in high school graduation rates, increases in college readiness, and in retention in college. Three such factors involve Advanced Placement (AP) courses, early college programs, and dual credit courses (Hoffman & Robins, 2005). Advanced Placement courses provide high school students, who enroll in rigorous coursework, an opportunity to prepare for college (Moore & Slate, 2008). In addition, students may also take AP examinations and in some cases earn college credit (College Board, 2012; Ewing, Huff, Andrews & King, 2005). In early college programs, high school students enroll in special high schools in which they take high school classes and college classes for the entire school day, and upon completion of early college program, students graduate from high school with a high school diploma and an associate degree (Edmunds,

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Bernstein, Unlu, Glennie & Arshavsky, 2011). The third factor, dual credit courses, is the focus of this manuscript.

Dual credit courses allow students to earn high school and college credit while they are taking a college course through their local community college (Estacion, Cotner, D'Souza, Smith & Borman, 2011; Speroni, 2011a). Dual credit emerged in the 1970s and 1980s in response to a need to keep talented students challenged, to help ease transition between high school and college, to develop vocational readiness, and to reduce time to obtain a college degree (Bailey & Karp, 2003; Burns & Lewis, 2000). The original intent of dual credit was to provide a challenging curriculum to academically prepared high school students (Kim, Kirby, & Bragg, 2004). After creating dual credit in Illinois around 1984, two changes created the momentum for increased growth; Illinois Community College Board permitting both colleges and high schools the ability to collect funding and grants (Andrews & Barnett, 2002).

Purpose of this Study

The purpose of this article was to review dual credit literature from both a historical perspective and comparison to other advanced-level courses. In our review of the dual credit literature, we generated eight areas of interest: (a) method of literature review search, (b) history, (c) dual credit as opposed to advanced-level high school courses, (d) standards, (e) participation and success, (f) access for students who are underperforming or have special needs, (g) effectiveness, and (h) dual credit used to earn an early college degree. Additionally, literature related to dual credit standards, participation, and access are presented. Finally, the efficacy of dual credit and the use of dual credit to earn an early college degree are discussed.

METHOD OF LITERATURE REVIEW SEARCH

A computer search on *dual enrollment or dual credit* in the title field or abstract and all 56 databases selected within the Academic Search Complete resulted in the location of hundreds of records. After choosing acceptable documents (e.g., peer reviewed), analysis of the reference section of each article helped identify additional and common resources used in the various articles. Work by Hughes appeared most often in these articles. After realizing the impact of Hughes's work in dual credit, a separate search was conducted using her name and dual credit. Advanced Placement was another search term, for use in comparisons as well as using the American Educational Research Association's database.

DUAL CREDIT/ENROLLMENT HISTORY

Dual credit programs have not had a clearly defined beginning. Illinois's dual credit program history started in the early 1970s depending on the institution (Barnett, Gardner, & Bragg, 2004; Makela, 2005). Mokher and McLendon (2009) concluded that dual credit program policy adoptions started in California in 1976 and increased as dual credit became popular. Unified Republican control of state legislative bodies increased the likelihood of adopting a dual credit policy (Mokher & McLendon, 2009). Virginia offered formal dual

credit programs since 1988 with the emphasis of dual credit on the articulation of students to college (Catron, 2001). The Texas Higher Education Coordinating Board (THECB) indicated that they have records back to 1999; however, some universities may have been accepting courses for college credit earlier than 1999.

In Florida, a goal of dual credit programs was enriched course opportunities and an accelerated mechanism for high school students that might reduce the time to obtain a baccalaureate degree (Windham, 1997). Academic rigor, a broad range of courses, an introduction to college expectations, a relevant curriculum, and a cost reduction were all enhancements for students who took advantage of dual credit programs (Andrews & Barnett, 2002; *Dual enrollment offers benefits, Faces roadblocks*, 2010; Hoffman & Robins, 2005; McCarthy, 1999). Some states created dual credit for better relationships between high schools and colleges, enhancing K-12 efficiency, increasing rigorous college-prep curriculum for all students, increasing attainment of postsecondary students, and reducing remediation (Krueger, 2006; McCarthy, 1999). Zeidenberg and Bailey (2009) expounded on the benefits of dual credit (e.g., obtaining college credit in high school, shortening time frame, decreasing costs); however, they believed that the challenge of dual credit course work and the decrease of culture shock are just as important or maybe more important than earning college credit, shortening time frame, and decreasing costs. Andrews (2001) pronounced dual credit benefits as acceleration of progress, reduction in tuition costs, reduction of boredom, and facilitation of student recruitment.

In a different use of dual credit, Lake City Community College accepted the task of providing rigorous and challenging college courses in its dual credit program to replace the honors programs that were in the high school but suffered spending cuts (Hunt & Carroll, 2006). Additionally, dual credit changes the focus to postsecondary educational institutions from occupational education institutions and can provide an early warning signal regarding students preparedness for college (Bailey, Hughes & Karp, 2003). Dual credit might enhance or improve students' prospects for college admission (Barnett & Hughes, 2010). Articles in which discussions related to the reasons for the creation of dual credit programs appear in Table 1.

Kim and Bragg (2008) documented the percentage of students who, after successfully completing a dual credit course were college ready in reading, 88.5% of high school graduates in Texas were college ready; 72.3% of Florida graduates were college ready, 88.4% of Oregon graduates were college ready; and 83.6% of Ohio graduates were college ready. Additionally, students who also successfully completed a dual credit course were college ready in writing 90.1% for Texas, 70.8% for Florida, and 86.2% for Ohio (Kim & Bragg, 2008). In math, college readiness was determined to be 81.1% for Texas students, 67.1% for Florida students, 76.4% for Oregon students, and 61.0% for Ohio students upon successful completion of a dual credit course. Another example of college readiness documented by Kim and Bragg (2008) was the presence of statistically significant positive relationships between being college ready in reading and writing with articulated credit hours (i.e., hours that are actually accepted by a college). Additionally, statistically significant positive relationships existed between dual credit hours earned and college readiness in mathematics (Kim & Bragg, 2008). Bailey, Hughes, and Karp (2002) provided evidence in their study that those students who were seniors and enrolled in dual credit courses, with a maximum of six credits per semester, demonstrated improved college readiness and were more likely to graduate from college on time than were seniors not enrolled in dual credit courses.

Table 1. Summary of studies in which reasons for dual credit programs were provided

Researchers	Year	Reasons
Windham	1997	Enrich opportunities and shorten time to degree
Andrews	2001	Acceleration of progress, reduced costs, relief of boredom, and facilitated student recruitment
Andrews & Barnett	2002	Academic rigor, broader range of courses, introduction to college expectations, relevance of course material, and reducing cost
Bailey et al.	2003	Focus to postsecondary educational institutions and can provide an early warning signal regarding whether students are college ready
Krueger	2006	Better relationships between high schools and colleges, enhancing K-12 efficiency, rigorous college-prep curriculum, and reducing remediation
Zeidenberg & Bailey	2009	College credit, shortening time frame, cost savings, course work more challenging, and decrease of culture shock
Barnett & Hughes	2010	Enhance or improve students' prospects for college admission

In Michigan, Republican lawmakers introduced legislation that would expand students' choices (Cavanagh, 2011). If the proposals pass, students have more choices including easing dual credit course restrictions at public schools and allowing nonpublic school students to enroll in dual credit courses (Cavanagh, 2011). As of June 2013, the proposal has not made any progress. Policies in Illinois on dual credit acceptance depend on whether the university is private or public. Public institutions use state policy (28.6%) and relationships with community colleges/high schools (28.6%); whereas private institutions compare themselves to peer institutions (33.3%) and request from students and parents (33.3%) to make their decision on dual credit program acceptance (Makela, 2005). Policy in Texas recently changed when the Texas Education Agency in collaboration with the THECB, contracted with the American Institutes for Research (AIR) and Gibson Consulting Group, Inc. (2011) to conduct a research study of dual credit in Texas stating,

As part of Texas' efforts to promote high school success and college readiness, legislation was passed in 2006 (HB1, §5.01, 79th Texas Legislature, 3rd Called Session) that requires each local education agency (LEA) to implement a program under which students may earn the equivalent of at least 12 semester credit hours of college credit in high school. The result of that legislation, Texas Education Code (TEC) §28.009, was amended in 2007 to stipulate that the college credit may be earned through Advanced Placement (AP) courses, International Baccalaureate (IB) courses, local and statewide articulated courses, and courses for dual credit. (p. 5)

An example of policy in which dual credit programs grew was in rural eastern Colorado at Morgan Community College where interactive video was used to increase access to dual credit. Unfortunately, the use of interactive video declined as expense funding for dual credit courses was transferred from the state to the high school, some of the high schools suspended their dual credit program due to lack of funds. Until funds disappeared, the use of interactive

video had increased the number of students taking dual credit (Gertge, 2004). In Colorado, of the 29 high schools in the dual credit program, nine of the 10 highest enrolling high schools had an enrollment of 40% of students who were eligible to enroll in dual credit (Gertge, 2004).

After the establishment of dual credit courses in various school districts, high schools began offering dual credit courses. Initially dual credit enrollment numbers were small; however, in recent years, dual credit enrollment numbers have increased. Enrollment in dual credit courses increased 31% from the 2007-2008 school year to the 2009-2010 school year with an enrollment of 180 million students in dual credit courses for the United States (AIR & Gibson Consulting Group, 2011). For example, increases in Texas dual credit enrollment from fall 1999 to fall 2007 were 64,910 students, for a 545% increase (THECB, 2008). Although en THECB enrollments are increasing, rural schools tend to offer fewer dual credit courses and have lower student enrollments than urban schools. Females enroll more often than males in dual credit courses. Catron (2001) provided evidence that rural high schools experienced larger enrollments in dual credit than urban schools. This phenomenon was partially due to urban schools' use of AP programs and rural schools providing more dual credit classes, making class attendance easier in dual credit courses. Moreover, White students enroll in dual credit in larger numbers than members of other ethnic groups (Catron, 2001).

Financial factors as well as other social factors contribute to student participation in dual credit in rural schools (Johnson & Brophy, 2006). Dual credit classes then afford the opportunity for rural students to enroll in college classes at reduced costs, giving rural students the experience of college prior to attending as a freshman. Many states are experiencing dramatic growth in dual credit enrollment affecting both rural and urban students which increased rural students opportunities for enrollment in dual credit courses (Karp, Calcagno, Hughes, Jeong & Bailey, 2008; Kentucky Council on Postsecondary Education, 2006; Krueger, 2006). Some of the reasons for this development are increases in legislative support and coordinating boards that define expectations, quality, and funding of dual credit classes (Andrews, 2000).

Growth in dual credit programs leads to increased availability at additional locations. National survey numbers in 2005 indicated that 74% of enrollments in dual credit occurred on a high school campus, 23% of enrollments occurred on a college campus, and 4% of enrollments occurred through distance education (Waits, Setzer & Lewis, 2005). Affirmed in a national survey conducted by the National Center for Education Statistics in 2005 that 71% of public high schools offered dual credit courses whereas 67% of public high schools offered AP courses (Waits et al., 2005). Barnett et al. (2004) acknowledged Illinois state survey results documenting an increase in enrollment, during the 2001-2002 school year of 25,551 students in dual credit courses, which was an increase of about 100% from the previous year and 10 times the enrollment in the 1991-1992 school year. Jordan, Cavalluzzo, and Corallo (2006) mentioned that locating the dual credit program on the college campus opened substantial opportunities for dual credit students to enroll in a broader array of courses, including advanced educational technology and the use of more comprehensive facilities than were available at high schools. In addition, locating dual credit classes on college campuses promoted positive interactions among high school and college students. This increased diversity and interaction with older students helping younger students learn to take their academic endeavors more seriously (Jordan et al., 2006).

Course content areas for dual credit are social studies, English, math, and science listed in descending order of demand as opposed to AP that only offers classes in specific areas (AIR & Gibson Consulting Group, 2011). Additionally, at two high schools in Utah, the dual credit program grew to over 35 courses that increased the stimulus for students to keep learning in high school during their senior year (Farrace, 2008). When the principals saw a need for a new course offering, they went to the various colleges and universities and located a college or university that would offer the course (Farrace, 2008). This diversity in courses helps high schools to increase their enrollment of dual credit students.

New initiatives in the areas of science, technology, engineering, and mathematics, commonly referred to as STEM, have created special programs designed to increase students' success and increased access to STEM classes (RMC Research Corporation, 2011). For example, Tennessee lawmakers, through funding from the Race to the Top Fund, developed dual credit classes designed for STEM fields in the virtual school through the Electronic Learning Center. The District of Columbia lawmakers are formulating rules and procedures for dual credit courses in the systems. Georgia and Hawaii have STEM related programs, and New York is expanding dual credit courses in math and science (RMC Research Corporation, 2011).

A final example of the new use of dual credit is Florida Atlantic University High School. This high school was a laboratory school located on the university campus instead of being a traditional high school. Moreover, the university covered all dual credit costs (Wright & Bogotch, 2006). Additionally, open communication between leaders and families became a mandate at Florida Atlantic University High School. This mandate prevented communication from being a problem for new students wanting to start enrolling in dual credit due to unclear policy and lack of information (McCarthy, 1999). The new university high school gave students opportunities to go to high school and enroll in college courses. Such opportunities provided students the ability to obtain a high school diploma and a 2-year degree at the same time (Wright & Bogotch, 2006).

DUAL CREDIT AS OPPOSED TO ADVANCED-LEVEL HIGH SCHOOL COURSES

States are adopting programs that accelerate high school students' success at both obtaining a high school diploma and earning credit for college courses, including AP, International Baccalaureate, Advance International Certificate of Education, Early College High School, and dual enrollment (Speroni, 2011a). The two major courses that accelerate high school students are dual credit and Advance Placement. Dual credit was created to provide students an opportunity to earn college credit whereas AP was specifically created for three reasons: (a) to keep students engaged; (b) to challenge advanced students who had exhausted their high school's course offerings; and (c) to provide a route for students to complete college-level work while still in high school (Klopfenstein & Lively, 2012). Another aspect of these programs is that both dual credit and AP are not always available to students at each high school. Dual credit offerings are more common when high schools are near community colleges or 4-year colleges, whereas AP is offered in large, high-

socioeconomic status schools, which tend to be in suburban areas (Klopfenstein & Lively, 2012).

The percent of colleges that offered dual credit to high school students in the United States in 2002 was 57% (Hughes, 2010). Dual credit enrollment increased as the student enrollment in high schools increased. That is, 36% of small-size high schools offered dual credit courses, compared to 74% of medium-size high schools, and 79% of large-size high schools (Hughes, 2010; Kleiner & Lewis, 2005). Another issue of importance related to dual credit programs involves teacher quality. High school teachers, who teach dual credit, must have a master's degree in the field of study in which they teach. High school teachers who teach AP classes are required to have a bachelor's degree, a teaching certificate for the field they will be teaching, and special training to teach AP courses (Klopfenstein & Lively, 2012).

The benefit of enrollment in dual credit courses is that when students enroll in a dual credit course; college credit is received after passing the course with a grade of C or better (Hughes, 2010; Klopfenstein & Lively, 2012; McCarthy, 1999). Taking an AP course by itself, does not award college credit, the students must take the AP test. If students attain an AP test score required by the college to which the students intends to matriculate, only then is credit received (Hughes, 2010; Klopfenstein & Lively, 2012). Dual credit courses can be any freshman course offered by the college, whereas AP courses are limited in number of areas. Finally, dual credit classes meet at the college or at the high school, and AP courses typically meet at the high school site.

Reporting on national numbers, the Abell Foundation (2007) described dual credit programs as having 1.2 million students enrolled, and AP programs as having 1.8 million students enrolled. Dual credit and AP classes can co-exist at the same school, and the schools do not have to offer only one or the other. For instance, in Geneseo, Illinois, the school district made a decision to give all students the opportunity to earn college credits (Swanson, 2007). The school district initiative included several steps that included AP classes and dual credit, which resulted in increases in enrollment for AP from 150 to 214 and in dual credit from 36 to 91 in the small rural school district (Swanson, 2007).

With budget cuts in 2008 and 2009, funding is an area of concern for all programs. Dual credit funding in Texas is as follows: 61% by the state, 18% by students and their families, 13% by institutions of higher learning, 6% by the local educational agency, and 2% by the federal government (AIR & Gibson Consulting Group, 2011). Evidence for as need in increased dual credit funding was demonstrated in a Texas study in which students successfully completed dual credit courses 99.9% of the time (AIR & Gibson Consulting Group, 2011). Funding for dual credit classes in Graham, Texas is \$38.00 less expensive than waiting and taking the class in college; however, if the students are on the free lunch program the dual credit class is free (Editorial: NCTC dual-credit program gives students a boost, 2012). In another state, dual credit funding increased due to lower costs than other programs that awarded college credit (Estacion et al., 2011).

Williams (2010) indicated that statistically significant differences were not present in freshman and sophomore GPA between students who had taken AP or dual credit or both AP and dual credit and students who had taken neither prior to enrolling in a large urban research institution. In addition, Thompson and Rust (2007) concluded students who enrolled in AP courses were not achieving a higher GPA than their peers who did not enroll in AP courses. Additionally, experiences acquired in AP classes do not reliably predict first semester college

grades or retention when other characteristics such as student, school, and curricular events were controlled (Klopfenstein & Thomas, 2009).

Klopfenstein and Thomas (2009) indicated that state policies mandating AP classes and preferential treatment on college entrance might be ill advised. Dutkowsky, Evensky and Edmonds (2003) espoused an example of how dual credit participation might assist students in a subject area more effectively than AP. Dutkowsky et al. (2003) explained that a quality concurrent enrollment program or dual credit program has the potential to expose more students to economics courses earlier and possibly increase interest in the subject matter for college bound students because it produces college credit directly. Yet more evidence of the efficacy of dual credit involved students who enrolled in dual credit economics classes performed better on the Test of Economic Literacy than students who did not enroll in such dual credit courses. In addition, students who enrolled in dual credit performed as well or better than students who enrolled in AP classes or students who had completed Honors classes on the Test of Economic Literacy (Dutkowsky et al., 2003). Table 2 is a summary of studies conducted by researchers who investigated dual credit courses compared to AP.

Table 2. Summary of research studies in which dual credit was compared to advanced placement

Researchers	Year	Dual Credit	AP
Dutkowsky et al.	2003	Better prepared	Not as prepared
Hughes	2010	College credit by grade of C	College credit by exam
Klopfenstein & Lively	2012	College credit, located on high school or college campus	Keep advanced students engaged, located on high school

DUAL CREDIT STANDARDS

Dual credit enrollment standards in the past have been rigorous and limited to students who excelled; however, these enrollment standards varied from state to state in admission requirements (Emeagwali, 2005). Students with GPAs of C or students of low socioeconomic status did not have opportunities to enroll in dual credit classes. Some of the ways that states are using dual credit more effectively is to move away from a strict GPA standard for students. In Florida, this change from a strict GPA standard did not occur due to Florida's minimum standards for dual credit enrollment. That is, Florida students must have a minimum GPA of 3.0 for all courses, with a minimum proficiency being required for some courses indicated by a specific score on a particular college placement test (Speroni, 2011a). An example of one North Carolina community college system's enrollment standards requires an achievement of an established score on either Compass or ACCUPLACER® prior to enrollment (League for Innovation in the Community College, 2002).

With regard to Texas dual credit standards, students must be in Grade 11 or 12 and meet one of the following six standards: (a) minimum passing standards under Texas Success Initiative; (b) score of 220 on math and /or 220 on English/Language Arts with a writing subsection score of at least 3 on the tenth grade TAKS; (c) combined score of 107 on the

PSAT/NMSQT with a minimum of 50 on the critical reading and/or mathematics test relevant to the courses attempted; and (d) composite score of 23 on the PLAN with a 19 or higher in mathematics and English and meets all of the college's normal requirements for that course and the student has a junior year standing, exceptions are available (THECB, 2008). One school district in Texas changed to provide every student an opportunity to be college ready by removing all obstacles to enrollment in dual credit and allowing every student to earn up to 45 college credits (Sturgeon, 2009).

At a Colorado community college, recommendation of administrators and faculty provided the basis for admissions during the first two years of dual credit programs (Gertge, 2004). For the next four years, high schools used the college placement exam. Following this period, admission standards aligned with state law in the subsequent four years, with a decrease in enrollment the first year of 1% and then an increase of 2% the following year (Gertge, 2004). In 2003, a single high school administrator pressed for the adoption of AP classes that caused a decrease in dual credit course enrollment from 67% of those students who were eligible to 34%, however, after the AP program was discontinued the enrollment trend reversed (Gertge, 2004).

An example of eligibility standards is that the students in Virginia must be 16 years old, recommended by school administrators, meet community college admission standards, and pay the costs of the course (Catron, 2001).

Another example of standards is the Administrative Rules of the Illinois Community College Board that requires students who want to enroll in dual credit courses to have correct academic qualifications, to be motivated, to have course time available, and to score high enough on course placement tests (Fontenot, 2003). For instance, in Georgia and Oklahoma requirements for enrolling in dual credit courses, after receiving principal recommendations, are high SAT/ACT scores, high GPA, and a high-class rank (Fontenot, 2003). Research studies in which dual credit enrollment standards by students who excelled and students who were below average appear in Table 3.

An example of several organizations working together was in 2010 when agencies including (a) Indiana Commission for Higher Education, (b) Oregon Department of Community Colleges, and (c) Workforce Development sponsored a report in which they indicated numerous state agencies might work together and share dual credit strategies (Lowe, 2010). In Oregon and South Dakota, program approval is required prior to offering dual credit courses in high schools for the students' credits to be accepted at a college. In all states, including Oregon and South Dakota, periodic reviews for all programs, reviews of student outcomes analysis (e.g., GPA and persistence), reviews of regular collegial meetings, reviews of course approvals, review of memoranda of understandings, and reviews of annual reporting are required for all dual credit classes.

Individual states may have different strategies at each institution that offer dual credit programs. For example in Illinois, dual credit was accepted at 25 of the 29 institutions; however, requirements included a minimum grade in the course (set by each state), the course had been taught at an accredited institution using college level materials, prerequisites were met, and the quality of the course was similar to college courses (Makela, 2005).

In one dual credit program, Jordan (2001) indicated that students who enrolled in dual credit had an option to either receive college credit only or receive credit for college and high school.

Table 3. Summary of research studies in which dual credit enrollment standards were examined

Researchers	Year	Students who Excelled	Students who were Below Average
Catron	2001	Yes	No
League for Innovation in the Community College	2002	Yes	No
Fontenot	2003	Yes	No
Gertge	2004	Yes	No
Emeagwali	2006	Yes	No
THECB	2008	Yes	No
Sturgeon	2009	Yes	Yes
Speroni	2011a	Yes	No

Another instance of states differing in their dual credit standards is the amount of information provided to students and to students' parents. Examples of information needed included: (a) eligibility of student to enroll in dual credit, (b) process for credit, (c) arrangement of finance, (d) consequences of failing, and (e) confirmation of acceptance in writing to the individual students (Jordan, 2001). Finally, the latest legislative session, lawmakers in one state declared students who enrolled in dual credit must have acceptable attendance records and receive the permission of the principal and the students' families (Brenneman, 2010). Budget allocation for dual credit programs favors high achieving students whereas students who are not high achieving and have a different status have lower budget allocation. For example, students who are economically disadvantaged in Pennsylvania receive only 8% of the budget for dual credit programs (Brenneman, 2010).

Some states are concerned with maintaining the standards of the teachers and the rigors of the course work (Andrews & Barnett, 2002; Klein, 2007). Farrell and Seifert (2007) provided evidence for teacher standards through their study in a community college that started its own dual credit program and did not hire qualified teachers. When the community college initiated dual credit classes, unqualified teachers staffed the classes even though the state educational authority required qualified teachers. As a result, 4-year colleges did not accept the high school students' dual credit classes (Farrell & Seifert, 2007). Abul-Karim (1999) documented the qualifications of dual credit teachers were different for teachers at the high school level as compared to teacher qualifications at the postsecondary level. Abdul-Karim (1999) declared that colleges and high schools could not produce accurate records for teacher qualifications or procedures for hiring the teachers to teach dual credit courses, which the researcher acknowledged affected college readiness for the students who enrolled in dual credit.

Staffing requirements for a new dual credit program would be (a) high school liaison for each college; (b) community college liaison for each high school for registration; (c) outreach liaison from the college; and (d) qualified faculty (Chapman, 2001). Additionally, strict teacher qualifications are necessary as well as a review process and educational career growth opportunities (Chapman, 2001). Other concerns for dual credit programs are fair funding mechanisms, identifying the needs of the students, clear policies and regulations, and balance

between academic oriented students and technically oriented students (*State dual enrollment policies not sufficient to reach students who might benefit most*, 2004).

Another concern documented in a statewide study of dual credit programs was alarm due to a lack of teacher credentials; therefore, administrators of the programs were working with 4-year colleges to address this issue (Harnish & Lynch, 2005). The teacher credential issue arose when higher level academic courses were introduced into the program thus requiring teachers with proper credentials (Harnish & Lynch, 2005). An additional example of assurance of teacher credentialing is to require teachers be employees of the community college (Fontenot, 2003). This practice would give the teachers and opportunity for faculty development, attend meetings, sit on committees, and socialization with their peers (Fontenot, 2003).

In interviews of two high school principals, Farrace (2008) concluded that teachers gain from teaching dual credit courses due to increased rigor and the need to keep current in the field that they are teaching, which translated across the rest of the faculty as well in increased knowledge and pride in their work. Leadership at Cerritos College in California reevaluated relationships with the local high school, in an effort to increase motivation and pride in their teachers, by forming a closer working relationship (Helfgot, 2001). Changes that resulted from the new relationship were more and different classes, more recruitment of students with potential to graduate, and more knowledge for the high school teachers of the college's dual credit program (Helfgot, 2001). Teachers at the high school, usually the better teachers who were qualified to teach dual credit, had a better relationship with the college who sponsored dual credit courses at the high school. These relationships encouraged teachers to stay current in their field of expertise. Additionally, teachers from the college who taught at the high school had the opportunity to interact with the high school, and this teacher student interaction created a better relationship, which increased recruitment for the college when the students transferred to a college (Helfgot, 2001).

Catron (2001) noted concern regarding dual credit classes not being as rigorous on high school campuses as they were on college campuses. Teachers contended that dual credit classes were more difficult than high school classes. Furthermore, these teachers observed that AP courses had not reduced AP participation (Rochford, O'Neill & Gelb, 2009). Harris (2003) documented the presence of safeguards in dual credit programs that might insure college level teaching. The more salient safeguards were (a) analyzing competencies; (b) filing copies of final exams submitted to the Dean's Council; (c) evaluating faculty members in the same way as on-campus adjunct faculty; and (d) tracking performance at transfer institutions.

DUAL CREDIT PARTICIPATION AND SUCCESS

With regard to dual credit participation by ethnicity, White students in Texas constituted 50.22% of dual credit students, compared to Hispanic students who comprised 38.32% of dual credit students. These percentages decrease for Black students who constitute only 5.25% of dual credit enrollment, Asian/Pacific Islander students who comprise only 2.96% of dual credit enrollment, and other students 3.25% (THECB, 2008). The actual number of students enrolling in dual credit for each ethnic group was 32,592 White students, 24,877

Hispanic students, 3,405 Black students, 1,921 Asian/Pacific Islander students, and 2,112 other students (THECB, 2008).

An example of motivating underperforming students California's Concurrent Courses initiative was an attempt to link dual credit courses to success in college classes (Edwards, Hughes & Weisberg, 2011; Golann & Hughes, 2008; Hughes & Edwards, 2012). Another example of California's Concurrent Courses initiative was an attempt to link dual credit courses and career pathways to motivate enrollment into college (Edwards et al., 2011; Golann & Hughes, 2008, Hughes & Edwards, 2012). Lords (2000) provided evidence of dual credit courses inspiring and challenging students who were underachievers or unmotivated, thus, validating the belief of teachers that if these students were challenged, they would perform better. Eight of the 16 students in this study demonstrated their ability to perform by passing dual credit classes and improving their high school GPA (Lords, 2000). Specific groups of students from which dual credit programs might be beneficial include students determined to be economically disadvantaged and students who underperform academically. Karp, Calcagno, Hughes, Jeong and Bailey (2007) reported that both these groups of students have experienced success in dual credit programs.

Dual credit classes provide students with an experience of college and help the students understand that they can succeed in college (Barnett & Stamm, 2010; Edwards et al., 2011; Hoffman & Robins, 2005; Kronholz, 2011; Speroni, 2011b). Additionally, students agreed that they received a broader and more enhanced academic education when they completed dual credit classes (Johnson & Brophy, 2006). Consequentially, the primary characteristics of dual credit enrollees were their focus on the attainment of a baccalaureate degree, attainment of a masters' degree, and completing two years of college, in order of preference (Smith, 2007). As compared to non-dual credit enrollees who were focused on baccalaureate degree, community college/vocational training, and less than two years of community college (Smith, 2007). D'Amico (2010) did not discover a difference in persistence due to enrollment in dual credit; however, dual credit might be used as a strategy to discourage students from dropping out of school and losing educated students.

Dual credit course effectiveness is the next step when evaluating dual credit courses, of the students who enrolled in dual credit courses, 99.9% of the students obtained a passing grade. Of the students who received a passing grade, 95% received a passing grade in the corresponding high school class, and 95% demonstrated proficiency in the 2010 Texas Essential Knowledge and Skills test (AIR & Gibson Consulting Group, 2011). Rochford et al. (2009) documented that students who enrolled in dual credit 80% of the time scored a grade of B or better provided another example of effectiveness. In 2010, AP effectiveness was only 17%, a slight increase from 15.9% in 2001 (Brown, 2011). Effectiveness was equated to students receiving a score of three or higher on the AP test (Brown, 2011). Other methods of improving effectiveness of dual credit courses are through team-teaching, technology, and parental engagement has helped students pass dual credit courses (Leonard, 2010).

Dual credit success in positive postsecondary outcomes was established by Karp et al. (2007) who documented that students who struggled to succeed in high school achieved a higher high school GPA through their enrollment in dual credit courses than did the typical student. Reese (2008) provided more evidence of dual credit success by noting that students who were at risk of dropping out of high school were helped by the rigor, relevance, and relationship of dual credit classes. Barnett (2006) advised that students who were at-risk or who played sports could perform well in school, provided they received support in the

challenging courses. Barnett (2006) also mentioned that students who experienced internships, planned for the future, expressed confidence, and had a sense of belonging performed better regardless of if they were at-risk or not. Karp et al. (2007) also contended that males and students who were economically disadvantaged had greater success after taking dual credit courses than did students who did not take dual credit courses. McCormick (2010), in a comparison of ACT scores, high school GPAs, dual enrollment GPAs, and number of dual credits earned, documented that students had higher scores when enrolled in dual credit than did students who were not enrolled in dual credit. Studies conducted by researchers who investigated dual credit benefits for students with special needs are delineated in Table 4.

Table 4. Summary of research studies regarding benefits of dual credit enrollment for students with special needs

Researchers	Year	Benefits
Barnett	2006	Internships, students who were at-risk, and played sports
Karp et al.	2007	Students who were struggling, males, and students who were economically disadvantaged
Reese	2008	Students who were at risk of dropping out and career selection

Dual enrollment GPA related to the number of college terms in which the student persisted in college (Eimers & Mullen, 2003; McCormick, 2010; Spurling & Gabriner, 2002). Dual credit course effectiveness and the ability to help students' succeed in college should be a high priority; due to dual credit's effect on helping students be college ready more often, remain in school more often, and earn a college diploma more often. Additionally, access to dual credit may need enhancement for students who are underperforming academically and students who are economically disadvantaged to facilitate their transition to college (Barnett & Stamm, 2010; Medvide & Blustein, 2010).

North Iowa Area Community College completed 17 studies on dual credit effectiveness with the following results: (a) 18% more students matriculated; (b) 61% increase in graduation; (c) of the students who transferred to Iowa's Regents' institutions 62% successfully graduated with a baccalaureate degree, including a difference of only 0.19 GPA between students who completed dual credit courses and students who had not completed dual credit courses; and (d) placement rate to chosen field of study ranged from 95% to 100% for students who completed dual credit courses (Morrison, 2008b). This success was present even though the majority of students, who enrolled at North Iowa Community College, did not take dual credit courses and were in the top 50% of high school students academically. More evidence was provided by Correa and Kouzekanani (2011) who examined perceptions of dual credit involvement by two groups at a community college. One group consisted of students who participated in dual credit, and the other group consisted of administrators. Both groups agreed that dual credit participation contributed to students' success at the college level. When Medvide and Blustein (2010) interviewed individual students, students related dual credit courses with influencing career decisions, enhancing self-confidence about academic skill, and understanding the connection between academic work and success. Several individuals related positive perceptions from the dual credit program. Setting career and academic goals was another benefit of attending dual credit classes related by the students

(Medvide & Blustein, 2010). Delineated in Table 5 are the results of students in which benefits of dual credit were delineated.

Table 5. Summary of Research Studies Regarding Benefits of Dual Credit

Researchers	Year	Benefits
Morrison	2008b	More students matriculated, improved odds of graduation, successfully graduated with a B.S., and placement to chosen field of study
McCormick	2010	Higher ACT score, high school GPA, and college persistence
Medvide & Blustein	2010	Influencing career decisions, enhancing self-confidence about academic skill, connection between academic work and success, and setting career and academic goals
Correa & Kouzekanani	2011	Contributed to student success at college

Table 6. Summary of Research Studies Regarding Benefits of Dual Credit Enrollment From a Student Perspective

Researchers	Year	Benefits
Marshall & Andrews	2002	Best teacher I ever had, excellent program, treated equally, extremely valuable, and first time challenged
Harnish & Lynch	2005	Earning college credit, treated as an adult, increasing earning potential, modern equipment, and peer influence
O'Connor & Justice	2008	Early start on college, taking the course early, extra GPA points/graduate, and parent or family or counselor support
Anderson	2010	College credit while in high school, cost, parents and/or family members support, teachers/guidance counselors support, opportunity to take classes not offered at high school, and opportunity to gain career skills
Bishop-Clark et al.	2010	More difficult than expected and appreciated classes were taught by teachers whom they knew
Robinson	2011	More prepared for the transition to college and had increased writing skills

Harnish and Lynch (2005) determined that earned college credit, treatment like adults, and increased earning potential as major reasons to enroll in dual credit courses. Additional motivations were going to a college campus, using modern equipment, and understanding peer influence. Problems related to the program were transportation for the rural school system students to the college campus and the barrier that the ASSET test created for students enrolling in dual credit. Interestingly, even though the ASSET test used as a college entrance test was being given to 10th grade students, no one complained (Harnish & Lynch, 2005). Qualitative information regarding dual credit efficacy was present by Marshall and Andrews

(2002). They provided samples of students' comments: "best teacher I ever had" (p. 238), "program was all around excellent" (p. 239), treated equally, "extremely valuable" (p. 239), and "first time I was really challenged" (p. 239).

O'Connor and Justice (2008) suggested that reasons to enroll in dual credit were experiencing incentives and challenges that offered an early start on college, taking the course early, earning extra GPA points, graduating in distinguished program, receiving parent or family or counselor support, and reasoning effects that were not discernible or described. Disincentives in enrolling in dual credit courses were financial, time, AP preferred more than dual credit, information on dual credit not available, preparation lacking, motivation lacking, and senior year laziness (O'Connor & Justice, 2008). Dual credit enrollment participation was influenced by the following factors, listed in order of most influential to least influential: (a) opportunity to earn college credit while in high school, (b) free college classes, (c) parents and/or family members, (d) teachers/guidance counselors, (e) opportunity to take classes not offered at high school, (f) friends, and (g) opportunity to gain career skills (Anderson, 2010; Andrews, 2004). Students who were interviewed stated dual credit courses prepared them academically for college, improved their critical thinking skills, and strengthened their study habits and writing ability (Anderson, 2010). Robinson (2011) contended that students developed skills and dispositions for the transition to college and had increased writing skills because of dual credit enrollment.

Satisfaction with the program at the Career Technical Education Center in Ohio was 94%, with most students rating the program good to excellent (Bishop-Clark et al., 2010). Positive outcomes included a free program, earned college credit, convenient high school location, and students would recommend the program to others (Bishop-Clark et al., 2010). Dual credit program enrollment of 64 White students at the Career Technical Education Center occurred in spring and fall of 2007 and spring of 2008. Parental support was 100%, and the students said dual credit was more difficult than they had expected, but the students appreciated dual credit classes taught by teachers whom they already knew at the Career Technical Education Center (Bishop-Clark et al., 2010). In an example of career selection benefits offered by dual credit classes, teachers at Louisiana Technical College stated that because the students could experience different areas of study before they had to declare a major, the students could select careers more effectively (Reese, 2008). Delineated in Table 6 are studies conducted by researchers who investigated dual credit benefits from students' perspectives.

DUAL CREDIT ACCESS FOR STUDENTS WHO WERE UNDERPERFORMING OR HAVE SPECIAL NEEDS

In an attempt to motivate students who were underperforming, California's Concurrent Courses initiative attempted to link dual credit courses and career pathways to motivate enrollment and success in college classes (Edwards et al., 2011; Golann & Hughes, 2008). Dual credit classes provided students with the opportunity to experience college level work and to gain an understanding for college classes. As such, a recommendation emerged for expanding the dual credit program to all students (Edwards et al., 2011; Hoffman, 2005; Speroni, 2011b). For instance, Rhode Island considered several changes to their dual credit

program requiring all students to have the opportunity to enroll in four courses and offering incentives for students who were low socioeconomic status. These changes were accomplished because most of the cost in Rhode Island was the responsibility of the students' family (Jobs for the Future, 2006).

In an effort to reach nontraditional students, Lake City Community College offered dual credit classes outside of the normal school day to expand access to all students, especially to underrepresented students (Hunt & Carroll, 2006). Currently, dual credit courses are for the gifted student, however, current thinking is for dual credit to be available for all students, including students who are low achieving (Emeagwali, 2005; Zeidenberg & Bailey, 2009). Hughes, Karp, Edwards, Belfield, and Rodriguez (2011) agreed with previous findings that dual credit has promise to increase college access and success among underrepresented and underprepared students.

Underrepresented students are increasingly taking AP classes to accelerate learning and to demonstrate college readiness; dual credit courses are also serving the same function for underrepresented students (Hoffman, 2003). For example, a new dual credit program started in 2012 between United Tribes Technical College in Bismarck, North Dakota, and regional high schools (Neumann, 2012; Robinson, 2011). This new dual credit program will ease the transition from high school to college for students who enroll in dual credit courses (Neumann, 2012; Robinson, 2011). Hart, Grigal, Sax, Martinez and Will (2006) asserted that students with intellectual disabilities, who enrolled in dual credit courses, while under the age of 18, would succeed. Some states' dual credit programs have options in their school systems nationwide to give students with intellectual disabilities which are between the age of 18 and 22 the same experiences as high school students, who are under the age of 18 (Hart et al., 2006). Different types of funding are available for these classes; however, funding must become available to students with intellectual disabilities (Hart et al., 2006). Reporting on national numbers, the Abell Foundation (2007) described dual credit and AP programs as having 1.8 million students enrolled in AP courses, and 1.2 million students enrolled in dual credit courses, with only 5% offering courses to students who were at-risk for different reasons.

EFFECTIVENESS OF DUAL CREDIT

College access and degree completion are strongly associated with dual credit and AP course completion with students who successfully pass AP courses more likely to enroll in a 4-year institutions and dual credit students more likely to enroll 2-year institutions with dual credit students underrepresented at 4-year colleges (Karp & Hughes, 2008; Speroni, 2011b). Lewis and Overman (2008) pronounced that students who successfully completed dual credit course work were 16% more likely to enroll in college than were students who did not enroll in dual credit classes. Additionally, students increased their attainment of certificates or degrees in high school when successfully completed dual credit classes (Hughes, 2010; Lewis & Overman, 2008).

Dual credit classes taken only at the high school did not have the positive outcomes that were present when the students completed the dual credit courses at a 2-year college (Speroni, 2011b). Students taking dual credit classes tended to earn a high school diploma and enroll in college (Karp et. al., 2008). Perkins and Windham (2002) identified dual credit course

success as effective for students, only when they enrolled in the next course in a series and completed that subsequent course successfully. No difference was present between male and female dual credit students' GPA. Research studies regarding the effectiveness of dual credit appear in Table 7.

Table 7. Summary of Research Studies Regarding the Effectiveness of Dual Credit

Researchers	Year	Effectiveness
Perkins & Windham	2002	Effective only if next course in sequence is taken and no difference in persistence
Karp & Hughes	2008	College access, degree completion, and more likely to go to 4-year and 2-year institutions
Karp et al.	2008	Earned a high school diploma and enroll in college
Lewis & Overman	2008	More successful, 16% more likely to enroll in college
Hughes	2010	Increased attainment of certificates or degrees in high school

Students who completed dual credit classes prior to college did statistically significantly better than non-dual credit students with the dual credit students obtaining a higher GPA than non-dual credit students (Hughes, 2010; Young, Joyner & Slate, 2013). Correa and Kouzekanani (2011) outlined a statistically significant difference between students who enrolled in dual credit courses and students who did not enroll in dual credit courses, with students who enrolled in dual credit courses attaining a higher GPA. In addition, no difference in persistence between the two groups of students was documented (Correa & Kouzekanani, 2011). Anderson (2010) indicated no difference in GPA between students who enrolled in dual credit and students who did not enroll in dual credit courses and no difference in later success in college were apparent between the aforementioned groups of students. Additionally, students returned questionnaires on which they indicated a belief of being better prepared by dual credit participation and completion. After reflecting on numerous studies, Anderson (2010) speculated that dual credit programs might replace AP or honors programs in high school.

Yet, more evidence of the efficacy of dual credit programs was provided by Sullivan-Ham (2001) who documented that students who had been enrolled in dual credit while in high school had higher first semester GPAs in college of 3.11 compared to the first semester GPAs of students who had not been enrolled in dual credit while in high school, 2.39. During the 1999-2000 school year, the Running Start program's dual credit students earned a GPA of 3.4 compared to a GPA of 3.1 for students who did not enroll in the Running Start program (Andrews, 2001; Meld, 2000). Researchers (e.g., Barnett & Stamm, 2010; Edwards et al., 2011; Golann & Hughes, 2008) in many states are examining the use of dual credit with respect to the effectiveness of dual credit courses. For instance, the Kentucky Council on Postsecondary Education (2006) indicated a modest positive effect at the end of the sophomore year in college on the students' GPA of one-third of a letter grade.

Morrison (2008a) established that students who enrolled in dual credit courses experienced a high school GPA advantage and an ACT composite score advantage over students who had not taken dual credit courses. When these same students matriculated, their cumulative GPA was 0.48 higher than the GPA of students who matriculated but did not

enroll in dual credit courses in high school. Consequently, the students who had taken dual credit courses would become full-time students quicker with an 836-day degree completion advantage (Morrison, 2008a). Spurling and Gabriner (2002) documented a difference of 5% between students who enrolled in dual credit (58%) and students who did not enroll in dual credit (53%) in passing their units once matriculated. Students after matriculating into college who enrolled in dual credit courses had a college GPA of 2.33 compared to the GPA of students who did not enroll in dual credit courses, of 2.10.

Table 8. Summary of Research Studies in Which College GPA was Used to Determine Dual Credit Effectiveness

Researchers	Year	Effectiveness
Andrews	2001	Saved \$37 million and students earned a GPA of 3.4 compared to 3.1
League for Innovation in the Community College	2002	Students who enrolled in dual credit courses had a mean GPA of 3.48 compared with 3.29 and mean math GPA was 2.48 for compared to 2.44
Spurling & Gabriner	2002	Students who enrolled in dual credit courses had a college GPA of 2.33 compared to 2.10
Kentucky Council on Postsecondary Education	2006	Modest positive effect at the end of the sophomore year on the students' GPA of one-third of a letter grade
Morrison	2008a	Experienced a GPA advantage and an ACT composite advantage and when the students matriculated, their cumulative GPA was 0.48 greater
Anderson	2010	No difference was present in GPA or success in college, however students believed they were better prepared and dual credit might replace AP program classes or honors program
Sullivan-Ham	2010	Students who had enrolled in dual credit first semester GPA was 3.11 compared to 2.39 and as number of dual credit classes taken increased, student GPA increased
Correa & Kouzekanani	2011	Higher GPA than non-dual credit students
Belfield et al.	2012	Higher GPAs at three locations and lower GPAs at two locations for dual credit students and positive effects on increased rates of college entry and college success
Young et al.	2013	Higher GPA than non-dual credit students

Higher GPA and continued enrollment are present in students who took dual credit courses (Hoffman, 2003; Hughes, 2010; Karp et al., 2008). At Salt Lake Community College in Utah, for instance, 2,001 students who enrolled in dual credit courses had a mean GPA of 3.48 compared with a GPA of 3.29 for those students who did not take dual credit courses (League for Innovation in the Community College, 2002; Peterson, Anjewierden & Corser, 2001). Additionally, the average math GPA was 2.48 for students who enrolled in dual credit

courses compared to an average math GPA of 2.44 for students who did not enroll in dual credit courses (League for Innovation in the Community College, 2002; Peterson et al., 2001). Students who were able to acquire college credits through dual credit courses in high school experienced higher levels of success in high school and college, which translated into early graduation in college (Morrison, 2008a).

Belfield, Hughes, and Rodriguez (2012) described higher GPAs at three locations and lower GPAs at two locations when they compared students who enrolled in dual credit courses and students who did not enroll in dual credit courses. Another positive aspect of enrolling in dual credit courses in high school was the positive effects on increased rates of college entry and college success (Belfield et al., 2012). Sullivan-Ham (2011) affirmed that as the number of dual credit classes taken increased, the students GPA in the first semester of college increased. Research studies related to the effectiveness of dual credit courses on college GPA are delineated in Table 8.

Students taking just one challenging popular dual credit course significantly increased their likelihood of enrollment and college degree attainment (Karp et al., 2008; Speroni, 2011a; Swanson, 2010). Students who enrolled in dual credit coursework enrolled in six credits or less (Kentucky Council on Postsecondary Education, 2006). Windham (1997) documented higher grades by students who had taken dual credit courses than students who had not taken dual credit classes. Additionally, students who enrolled in a dual credit program performed better in the next level courses compared to students who did not enroll in dual credit courses.

Students who participated in dual credit were more likely to persist through the second year of college by 11% and improved the likelihood of receiving a Bachelor of Arts degree (BA) by 16% to 20% over students who had not taken dual credit (Swanson, 2010). For instance, the United States Department of Education established that the average number of years for students to obtain a bachelor's degree without dual credit coursework was 4.65 years compared to those students with dual credit coursework whose average number of years to degree attainment was 4.25 years (Krueger, 2006). Additionally, students who had taken dual credit and who had taken 20 more hours after enrolling in college were more likely to persist through the second year of college by 28%. Furthermore, their likelihood of receiving a BA increased by 14% over students who had not taken dual credit (Swanson, 2010). Reducing time to BA was reinforced by results produced by An (2012).

Hébert (2001) compared students enrolled in dual credit programs taught by high school teachers with students taught by college professors. Students taught by high school teachers received higher grades (i.e., As and Bs) on subsequent course work than students taught by college professors. In agreement, Hugo (2001) established that students who enrolled in dual credit programs performed better than college students who did not enroll in dual credit courses. Whissemore (2012) documented effectiveness of dual credit programs in the United States in 2012 as dual credit students were 12% more likely to attend college and 7% more likely to earn a bachelor's degree than students who had not enrolled in dual credit courses. Additionally, Whissemore (2012) established that taking a rigorous dual credit course increased the likelihood of attaining a college degree by 23%.

Dual credit coursework can be a source of college access for low-income students (Hoffman, Vargas & Santos, 2009). Karp et al. (2007) documented dual credit programs success in providing positive postsecondary outcomes and mentioned groups were struggling to succeed. Karp et al. (2007) also documented that dual credit programs affected especially

males and low-income students positively. An (2012) suggested that dual credit courses did not reduce time-to-degree for students who were low- and middle-socioeconomic status; however, he postulated that dual credit classes do not hinder students who are low-socioeconomic status in their degree attainment. Studies conducted by researchers who investigated the effectiveness of dual credit regarding dual credit effectiveness and college success appear in Table 9.

Table 9. Summary of research studies regarding dual credit effectiveness and college success

Researchers	Year	Effectiveness
Windham	1997	Higher grades and better in the next level course
Hugo	2001	Students performed better
Krueger	2006	Time to degree is 4.65 years as compared to 4.25 years
Karp et al.	2007	Struggling to succeed
Karp et al.	2008	Increased likelihood of college completion and likelihood of enrollment and college degree
Hoffman et al.	2009	Source of college access for low-income students
Swanson	2010	More likely to persist thru the second year of college by 11% and improved the likelihood of receiving a BA by 16% to 20%
Swanson	2010	After 20 credit hours at a college students were more likely to persist the second year of college by 28% and improved the likelihood of receiving a BA by 14%
An	2012	Reducing time to BA
Whissemore	2012	Students were 12% more probable to attend and 7% more probable to earn bachelor's degree, rigorousness in dual credit course work increased attaining a college degree by 23%

DUAL CREDIT USED TO EARN AN EARLY COLLEGE DEGREE

To improve the outcomes of dual credit classes and eliminate the loss of scholarships for not having an associate's degree when entering a 4-year college, Patrick County Public Schools now has the D-Squared Program that allows high school students to earn a high school diploma and an associate's degree concurrently (Morris, 2010). In this D-Squared Program, 15.6% of the 2010 graduating class attained their associate's degree, and all but one of the dual credit participants attained their first college choice (Morris, 2010). Students in the D-Squared Program gave a 93% indication of a desire to attend college (Morris, 2010). The entire school district focused on simulating the entire student body to obtain college credits, the graduating class of 2010 received 3,743 college credit hours, and 95% of the class had enrolled in dual credit classes (Nodine, 2011).

DISCUSSION

Addressed in the literature review was a history of dual credit starting with when dual credit was created, why dual credit was created, what policy changes occurred from the start

to the present, status of student enrollment, and new initiatives that affect dual credit. In addition, compared in the review were dual credit offerings with other programs in which opportunities for college credit are provided for high school students. Additionally, a review of dual credit standards for enrollment into the program, standards on the program, and teacher qualifications was completed. Participation in dual credit programs were reviewed, as well as how to broaden participation, followed by quality of dual credit programs and the success of the students who received dual credit. Also reviewed were students' perceptions of the benefits of dual credit programs. Finally discussed was the effectiveness of dual credit programs with respect to improvements in student preparedness for college, increases in high school GPA, increases in college GPA, and increases in the number of dual credits completed.

The literature reviewed in this article reflects: (a) strengths and weaknesses of dual credit programs, (b) issues related to maintaining quality of the dual credit programs, (c) diversification of student enrollment, (d) level of rigor maintained, and (e) cost effectiveness compared to AP programs. Additionally, in this review of the literature, the existence of gaps in research in the areas of comparative studies between dual credit, AP, and other college credit programs emerged. Cost benefit analysis studies need to be conducted with respect to dual credit versus AP, and other college credit programs. That is, the costs of obtaining college credit through college credit programs, both for students and for school districts, need to be contrasted.

Only limited research has been conducted regarding the effects of dual credit when the students matriculate directly into a 4-year college or university. Most of the studies that are available are from community colleges. In future research studies, dual credit courses, along with AP and IB programs, should be included for comparison. More research needs to be focused on the effects of programs where students who are underachieving are tutored and then receive the opportunity to take dual credit programs. Researchers have expounded on the effectiveness of this approach for students who do not believe that they can do college level work. Dual credit has the opportunity for state legislature to close the gap between graduating college and succeeding in college.

Yet another area to investigate involves the relationship of dual credit to college graduation rates. To what extent do students who complete dual credit courses graduate within four years or graduate in less time than students who do not complete such courses? Furthermore, the retention rate of students who take dual credit courses needs to be compared to students who do not take dual credit courses. Though dual credit, along with other college credit programs, are quite popular, their popularity is based on minimal empirical research, with respect to their efficacy. As such, we strongly encourage researchers to examine these college credit programs and for policymakers to be providing support for such investigations.

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