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Concurrent Enrollment Benchmark Data and Self-Study Report 2014 .pdf

Ron J Hammond

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Abstract

This study was based on data analysis of 82,119 UVU/UVSC student records. An IRB application "Secondary Analysis of UVU's Concurrent Enrollment Data" was submitted on 12 July 2013 and approved (approval #01096) on 18 July 2013. The main purpose of the research was to provide benchmark data and a self-study report thereby establishing informed strategies to improve UVU's overall Concurrent Enrollment Department and student success. The analyses presented below are post-hoc and descriptive utilizing a minimum threshold of .05 levels of statistical significance. Outcomes were measured for the following four categories of students: Concurrent Enrollment (CE), Advanced Placement (AP), Distance Ed. (DE), and On-Campus (OC) students. Multiple Comparisons of mean scores indicated that the AP students graduated more: Associate, bachelors, and doctoral degrees while OC student graduated with more Masters Degrees.

Background Information

UVU's Concurrent Enrollment (CE) program has been in operation for 25 plus years with a national accreditation from NACEP since 2005. This study accessed existing UVU records information comparing students who took dual education between Fall 2003 and Summer 2012 semesters. UVU's Institutional Research (IR) Department anonymously combined student's UVU educational records (up to July 2013) with their National Student Clearinghouse Data (NSC) records.

This study was based on data analysis of 82,119 UVU student records. In 2013 an IRB application was submitted to UVU's IRB Board (http://www.uvu.edu/irb/) in cooperation between: Ron Hammond, BESC Faculty; Robert Loveridge, Director of UVU Institutional Research Dept., and Ted Ungricht, Director of UVU Concurrent Enrollment Dept. The IRB application "Secondary Analysis of UVU's Concurrent Enrollment Data" was submitted on 12 July 2013 and approved (approval #01096) on 18 July 2013. The main purpose of the research was to provide benchmark data and a self-study report thereby establishing informed strategies to improve UVU's overall Concurrent Enrollment department and student success.

The analyses presented below are post-hoc and descriptive utilizing a minimum threshold of .05 levels of statistical significance. Descriptive studies in the dual education field are common. For example, Bailey & Karp (2003) performed a meta-analysis of 45 dual education articles, observing that many were similar to this study and therefore limited by their descriptive designs. Much of the descriptive research results from budget and research talent limitations within institutions (see also Golann & Hughes, 2008 & Karp and Jeong, 2008).

Definition of Categories Utilized in This Analysis

There were five categories used in this analysis. Four included students who exclusively took only one of the following dual education-type courses while in high school: Advanced Placement (AP), Concurrent Enrollment (CE), On-Campus (OC), or Distance Education (DE). The fifth category included students who did took none of the above types of dual enrollment courses while in high school.

For example, differences of means tests (T-tests) were run between CE students and Non-CE students, while simultaneous controls were implemented to ensure that those who did not take CE had also not participated in AP, DE, nor OC courses. The data included records for 46,663 males (56.8%) and 35,453 females (43.2%). The majority of students were self-identified as: Caucasian (57.6%), followed by Asian (2.1%), Native/Pacific Islander (1.1%), Black or African American (1.0%), and Alaskan Native/Native American (0.8%), and unspecified (1.9%). Hispanic/Latino/Latina was also selected by students (5.4%). Because of changes in IPEDS requirements under which many of these students registered, a large proportion of race and ethnic data was left blank (30.1%).

The median age was 25.3 with 90.3 percent having been born after 1974. Table 1 Shows a matrix of how many students took each type of dual education course. Initial analysis indicated that Concurrent Enrollment students were the most common dual enrollment type. Of the 12,360 CE students 7,639 took CE courses exclusively, while 2,738 took CE and DE, 1,628 took CE and AP, and

1,719 took CE and OC courses. Of the 5,074 AP students, 467 took AP and DE, and another 524 took AP and OC. Finally, of the 5,307 DE students, 1,834 to DE and OC. There were a total of 8,686 OC students.

Comparisons of CE, AP, DE, or OC

Table 2 shows a comparison of means and standard deviations between CE, AP, DE, and OC students who took participated in only one modality of dual enrollment. By far, the DE students had the highest average number of dual enrollment credits while in high school with 29.83 (OC=16.17,AP=11.59, & CE=7.90 credits).

Interestingly, Hoffman and Vargas (2010) provided policy guidelines to better empower disadvantaged students to earn more college credit before they graduate from high school. They identified a benchmark found to be highly associated with better outcomes in postsecondary colleges and universities—the accumulation of at least 20 college credits. Another comparison was made on the average number of years after graduating high school that were taken before officially starting at UVU. The AP students had an average of 2.55 years (CE=1.77, DE=1.46, and OC=0.38).

Table 3 shows means and standard deviations of standardized test scores between CE, AP, DE, & OC students. These standardized test scores can be used as proxies for student readiness. The students who only took AP scored highest on 12 out of 14 measures, including all ACT tests, all Accuplacer tests, Compass writing and Compass algebra tests. But, the DE students scored highest on Degrees of Reading Power and Compass Pre-Algebra tests. Other, more complex research analysis have reported few if any statistical differences between AP and CE students (Mattern 2009 & Speroni, 2011b).

Table 4 shows that AP students scored better on 9 out of 12 UVU performance assessments. They had the highest percent retained from first to second year (60.0%), highest percent reaching their UVU quantitative literacy and English requirements (80.0% & 89.0% respectively), highest percent to earn an Associates at UVU (18.0%), and the highest last term UVU GPA (3.02). AP students were also more likely to enroll in another institution after leaving UVU (38.0%). AP students scored desirably lower on ever taken a remedial math (9.0%), developmental math (28.0%), and remedial English (5.0%).

DE students were more likely to earn a UVU certificate (0.80%). OC students were more likely to earn a UVU Bachelor's Degree (26.0%) and had the shortest average number of years to earn their Associates (1.61 years) and Bachelor's (2.44 years). It is not surprising that the OC students had the second highest percent attending another institution after leaving UVU (34.0%), highest percent earning a Bachelor's degree, and the second highest earning an Associate's degree (15.0%) at UVU.

Borden et al. (2013) reported on dual credit in the United States Higher Education system. They provided analysis of all 50 states' policies on dual education and made the specific recommendation of providing an authentic college experience for high school students taking dual education courses. Those attending on campus, taking courses side by side with "real" university students are arguably getting the most authentic experience they can.

Table 5 shows comparisons of CE, AP, DE, and OC students in their academic performance after leaving UVU. Again the AP students had the highest levels of performance in 4 of the six measures. Ap students had the highest percent earning a post-UVU: Associate's (3.40%), Bachelor's (8.60), and Doctoral (1.40%) degree. AP students also had the second highest percent earning a Master's degree (1.60%). The OC students had the highest percent earning a Certificate (2.10%) and a Master's degree (3.30%). OC students also had the second highest percent earning an Associate's (3.30%), Bachelor's (6.60%), and Master's degree (3.30%).

It becomes obvious that the AP students have superior college readiness, UVU, and post-UVU performances in almost all measures. The very fact they Advanced Placement still has signaling power for competitive readiness as candidates for more selective institutions supports the claim that these UVU students who chose AP were fundamentally different that the other dual enrollment students in terms of college readiness and academic skills. It would be in error to assume that all dual education students are on equal par when commencing their dual enrollment activities. If a researcher made that assumption it would most likely introduce a selection bias into the analysis.

Perhaps one of the most important dual enrollment research issues is that of the selection bias found in recent dual enrollment research studies (Drew 2010 & Bartlett 2008). On the other hand, previous studies have found little or no difference between AP and other dual enrolled students. Speroni (2011b) conducted a longitudinal cohort comparison of 229,828 of Florida's AP and DE programs between 2000-2006. Findings suggested that both AP and DE are associated with higher degree attainment and that DE students were more likely to go to community college whereas AP students were more likely to enroll in a 4-year degree granting institution.

Comparisons of Dual Education Students to Non-Dual Education Ones

This section includes research similar to other published studies in the field wherein the high school students who took dual enrollment are compared to other students at their institutions who did not. Using SPSS, the select if command was used in such a way as to create a sample who did and did not take dual enrollment classes. This means that each category of dual enrolled student is compared to students who took no dual enrolled credits of any kind. For example, when comparing those who took CE classes, the select if command read, "Select if AP=0, OC=0, and DE = 0 respectively. Then T-test comparisons were run comparing those who earned CE credits "Yes CE" to those not earning any dual enrollment credits of any kind, "No Any."

Table 6 shows the means and standard deviations derived from T-test analysis of CE and Non-CE categories of students with significant difference levels applied to each specific variable. In general, results indicated only slight differences between CE and Non-CE students. CE students scored slightly better on 17 of 33 variables while Non-CE students scored slightly better on 12. Each group tied on percent earning a UVU certificate 0.30 percent. CE students and Non-CE students CE students had earned an average of 7.90 credits while in high school with a range between 0.5 and 45.0 credits. By the end of their UVU studies, CE students had earned only 4.63 more credits than Non-CE students (66.38 and 61.75 respectively). CE students came to UVU sooner after graduating high school than the Non-CE students with an average of 1.77 years compared to 4.81 years.

In terms of standardized test scores, CE students technically scored better on 10 of the 13 standardized tests. But, when adding calculating an average score for all 13 variables, CE students scored on 1.34 points higher than Non-CE students. CE students retained more from their first to second academic year (57.0% and 51.0% respectively). By the end of their UVU studies they had a significantly higher (0.19 points higher) overall UVU GPA (2.60 compared to 2.41, .001 level). CE students were significantly more likely to have earned a UVU Associate's degree (14.0% compared to 8.0%, .001 level), but they took 0.15 years longer to earn it (2.85 compared to 2.70, 001 level).

CE students earned fewer UVU Bachelor's degrees (9.0% compared to 10.0%) and again took slightly longer to earn it (4.54 years compared3.67). After finishing their UVU studies the CE students had earned 4.63 more average UVU credits which was significantly different (66.38 compared to 61.75, .001 level). CE students were less likely to enroll somewhere else after leaving UVU (23.0% compared to 32.0%, .001 level). The Non-CE students earned more non-UVU degrees in each and every degree earned category. This coincides with Speroni's (2011a) study of Florida dual education student performance. Speroni said, "I find no evidence that simply taking a DE course improved marginal students' rates of high school graduation, college enrollment, or college degree attainment" (Abstract page iii).

Table 7 shows T-Test results between AP and Non-AP categories. The AP students scored better on 32 out of 33 measures and there was far more distinction between their comparative average scores and percentages. AP students brought 11.59 credits of dual education to UVU (range was 2-86 AP credits) and came to UVU after graduating high school an average of only 2.55 years (compared to 4.42 years). In terms of standardized test scores, AP students scored significantly higher on 13 of the 13 standardized tests. The average difference score was 8.78 points higher for AP Students across the 13 variables. AP students had higher retention (60.0% & 52.0%), lower percentage of having to take remedial math (9.0% & 30.0%), and lower remedial English (5.0% & 16.0%). AP students had a much higher percent of reaching quantitative literacy (80.0% & 43.0%) and English literacy (89.0% & 64.0%).

AP students earned significantly more UVU credits (91.52 & 61.00) and had a higher GPA (3.02 & 2.41). AP students had a lower percent earn UVU certificates (0.20% & 0.30%). But more AP students earned UVU Associate's (18.0% & 9.0%), Bachelor's (16.0% & 9.0%), post-UVU Certificates (1.10% & 1.00%), Associates (3.43% & 1.90%), Bachelor's (8.60% & 5.30%), Master's (1.60% & 1.20%), and Doctorates (1.40% & 1.00%).

Even though these AP students had significantly better scores and outcomes, Klopfenstein and Thomas (2006) found that Texas AP students were not better off. They studied 28,000 Texas students from the Texas Schools Microdata Panel (TCMP) which included data about students from 31 public universities Fall, 1999. They reported that AP still serves an important signal to more selective colleges and universities but that they "found no evidence that the average student derives a positive benefit from AP experience beyond that provided by a non-AP curriculum strong in math and science (Page 1).

One reason for the discrepancy may well be that UVU still has an open-enrollment policy while some of the Texas institutions were more selective. In fact, Speroni (2011b) conducted a

longitudinal cohort comparison of 229,828 of Florida's AP and DE programs between 2000-2006. Findings suggested that both AP and CE are associated with college access and degree attainment and that CE students were more likely to go to college whereas AP students were more likely to enroll in a 4-year degree granting institution. The issue of divergent educational quality between community colleges and 4-year institutions was raised. UVU's mission lies somewhere between those two levels.

Table 8 shows the comparisons between DE and Non-DE students. DE students brought 29.83 dual enrollment credits to UVU (range was 1 to 138). In general, the distance education students very closely resembled their non-distance education counterparts. DE students were higher on only 20 of 33 comparisons and Non-DE students were higher on 12 of 33. They tied on one measure where both reached English literacy at 65.0 percent. Interestingly DE students brought 29.83 total dual enrollment credits to UVU. They also only waited an average of 1.46 years after graduating high school to come to UVU (compared to 4.93 for non-DE).

DE students scored slightly better on 9 of the 14 standardized test scores. They retained at about the same percentage (53.0% & 52.0%). They had lower percentages needing remedial math (19.0% & 29.0%) and remedial English (9.0% & 15.0%). They also had a lower percent reach quantitative literacy (39.0% & 45.0%). DE students earned a higher average number of UVU credits (79.07 & 62.33).

Their overall UVU GPA was lightly higher (2.50 & 2.44). DE students earned slightly more UVU Certificates (0.80% & 0.30%). But, they earned less UVU Associates (4.0% & 9.0%) and Bachelor's degrees (13.0% & 10.0%). When they did earn a UVU Associates (2.27 & 2.71 years)or Bachelors (2.73 & 3.79 years)it took fewer average years to obtain them. They were less likely to enroll after leaving UVU (28.0% & 31.0%). They were more likely to earn a non-UVU certificate (1.70% & 1.00%). But they were less likely to earn a non-UVU: Associates (1.0% & 2.10%), Bachelor's (3.80% & 5.50%), Master's (1.0% & 1.20%), or Doctorate (0.90% & 1.00%).

Table 9 shows comparisons between OC and Non-OC students. OC students brought 16.17 credits from dual education to UVU (range was 0.50 to 171.0 credits). They waited only 0.38 years before coming to UVU (4.97 for Non-OC). In general the OC students were extremely similar to non-OC students. OC students scored better on only 9 of the 13 standardized test scores and there was essentially no average difference in their summative scores. They retained slightly less (49.0% & 51.0%). They enrolled slightly more after UVU (34.0% & 32.0%). They required more remedial math (33.0% & 31.0%)and remedial English (23.0% & 17.0%). They did eventually reach quantitative (57.0% & 41.0%)and English literacy (71.0% & 63.0%)more. OC students had an overall higher UVU GPA (2.90 & 2.38).

But, they earned more UVU Certificates (0.40% & 0.30%), Associates (15.0% & 8.0%), and Bachelors (26.0% & 10.0%) and did it in a shorter time (1.61 & 2.78 Associates) and (2.44 & 3.73 years Bachelor's). They also earned more post-UVU certificates (2.10% & 1.00%), Associates (3.30% & 2.00%), Bachelor's (6.60% & 5.60%), and Master's (3.30% & 1.30%) but not doctorates (0.70% & 1.10%).

The 20+ Dual Enrollment Credits Earned Threshold

As mentioned, Hoffman and Vargas (2010) identified the threshold of having accumulated at least 20 credits of dual enrollment as a benchmark found to be highly associated with better outcomes in postsecondary colleges and universities.

Did having earned at least 20 CE credits impact these UVU student's performance while at UVU and after transferring to another institution? Table 10 shows the means and standard deviations (not T-Tests) of students who earned at least 20 UVU CE credits in comparison to those who earned no dual enrollment credit in any form.

CE students scored better on 27 of 33 measures as reported in Table 10. They brought an average of 24.05 credits of dual education from high school. They scored better on 12 of 13 standardized test scores. They retained more (56.0% & 51.0%) and took less remedial math (19.7% & 29.0%) and English (9.1% & 15.0%). They reached quantitative literacy far more (74.1% & 43.0%) and English literacy more (80.0% & 60.0%). CE students had a higher UVU GPA (2.82 & 2.41) and earned more UVU credits (88.28 & 61.75). They also earned more UVU Certificates (0.6% & 0.0%), Associates (25.4% & 0.80%), and Bachelor's degrees (13.1% & 10.0%).

It took CE students less time to earn their Associates (2.38 years to 2.70 years). But, it took slightly more time to earn a Bachelor's degree (4.07 years to 3.67). CE students enrolled less in post-UVU institutions (25.0% & 32.0%). CE students did earn more post-UVU certificates (1.4% & 1.0%) and Associates (3.7% & 2.0%), but fewer Bachelor's (4.0% & 5.7%), Master's (0.9% & 1.3%), and Doctorates (0.6% & 1.1%). In sum, having earned 20 or more CE credits was associated with a number of better outcomes for these students.

Did having earned at least 20 AP credits impact these UVU student's performance while at UVU and after transferring to another institution? Table 11 shows the means and standard deviations (not T-Tests) of students who earned at least 20 UVU AP credits in comparison to those who earned no dual enrollment credit in any form.

AP students scored better on 32 of 33 measures as reported in Table 11. They brought an average of 27.34 credits of dual education from high school. They scored extremely better on 13 of 13 standardized test scores. They retained more (61.0% & 52.0%) and took far less remedial math (2.7% & 30.0%) and English (1.5% & 16.0%). They reached quantitative literacy far more (88.4% & 43.0%) and English literacy more (95.0% & 64.0%). AP students had a higher UVU GPA (3.22 & 2.41) and earned more UVU credits (117.1 & 61.0). They also earned more UVU Certificates (0.4% & 3.0%), Associates (22.4% & 9.0%), and Bachelor's degrees (20.9% & 9.0%).

It took AP students less time to earn their Associates (1.9 years to 2.74 years) less time to earn a Bachelor's degree (3.28 years to 3.79). AP students enrolled more in post-UVU institutions (41.0% & 31.0%). AP students earned fewer post-UVU certificates (0.8% & 1.0%). They earned more Associates (5.4% & 1.9%), but fewer Bachelor's (11.6% & 5.3%), Master's (2.1% & 1.2%), and Doctorates (1.7% & 1.0%). In sum, having earned 20 or more AP credits was associated with a

number of much better outcomes for these AP students who based on previous findings excel above all other dual education modality students in most measures.

Did having earned at least 20 DE credits impact these UVU student's performance while at UVU and after transferring to another institution? Table 12 shows the means and standard deviations (not T-Tests) of students who earned at least 20 UVU DE credits in comparison to those who earned no dual enrollment credit in any form.

DE students scored better on only 18 of 33 measures as reported in Table 12. They brought an average of 59.56 credits of dual education from high school. They scored better on only 6 of 13 standardized test scores. They retained far more (91.0% & 52.0%) and took far less remedial math (24.4% & 29.0%) and English (12.1% & 15.0%). They reached quantitative literacy far more (50.6% & 45.0%) and English literacy more (83.3% & 65.0%). DE students had a higher UVU GPA (2.68 & 2.44) and earned far more UVU credits (114.65 & 62.33). They earned fewer UVU Certificates (0.0% & 0.03%). But they earned more Associates (4.40% & 0.90%), and Bachelor's degrees (26.6% & 10.0%).

It took DE students less time to earn their Associates (2.58 years to 2.71 years) and less time to earn a Bachelor's degree (2.68 years to 3.79). DE students enrolled less in post-UVU institutions (19.0% & 31.0%). DE students did earn more post-UVU certificates (1.3% & 1.0%) but fewer: Associates (0.4% & 2.1%), but fewer Bachelor's (1.3% & 5.5%), Master's (0.4% & 1.2%), and Doctorates (0.4% & 1.0%). In sum, having earned 20 or more DE credits was associated with a few remarkably better outcomes, but with a few worse outcomes for these students.

It is apparent that DE students were found to have the lowest benefit, scores, and outcome measures in comparison to CE, AP, and OC students. They had a few higher scores in comparison to their non-dual education control group, but students in the other modalities had relatively more. Findings from a 2009 study may shed some light on this study's results. Judd et al. (2009) compared 152 high school CE students taking a face-to-face course to 212 high school students taking a televised CE course. Results from their 33 question survey indicated an equal motivation to attend college between the groups. They also reported that televised course takers felt less prepared for college; felt that their televised courses were not equivalent to on-campus courses; were less satisfied; and were less likely to attend the university that sponsored the course than were those who took a CE course face-to-face (see also Deka & McMurry (2006).

Did having earned at least 20 OC credits impact these UVU student's performance while at UVU and after transferring to another institution? Table 13 shows the means and standard deviations (not T-Tests) of students who earned at least 20 UVU OC credits in comparison to those who earned no dual enrollment credit in any form.

OC students scored better on only 22 of 33 measures as reported in Table 13. They brought an average of 46.64 credits of dual education from high school. They scored better on only 8 of 13 standardized test scores. They retained more (69.0% & 51.0%). OC students had to take more math (236.4% & 31.0%) and English (26.6% & 16.0%). They reached quantitative literacy more (61.5% & 41.0%) and English literacy more (76.3% & 63%). OC students had a higher UVU GPA

(2.97 & 2.38) and earned far more UVU credits (115.4 & 59.7). They also earned far more UVU: Certificates (0.6% & 0.3%), Associates (14.3% & 8.0%), and Bachelor's degrees (28.2% & 10.0%).

It took OC students less time to earn their Associates (1.56 years to 2.78 years). But, it took slightly more time to earn a Bachelor's degree (2.24 years to 3.73). OC students enrolled less in post-UVU institutions (25.0% & 32.0%). OC students earned mores post-UVU certificates (1.6% & 1.0%) and Master's degrees (2.10% & 1.30%). They earned fewer post-UVU: Bachelor's (3.5% & 5.6%), and Doctorates (0.4% & 1.1%). In sum, having earned 20 or more OC credits was associated with a mix of better and worse outcomes for theses UVU OC students.

Table 14 shows comparisons on 34 measures between the CE, AP, DE, and OC students who took 20 or more credits in these respective dual education modalities. DE students brought the most dual education credits (59.56) and OC students had the shortest duration of time after high school graduation and before attending UVU (1.02 years). The AP student scored far better on 13 of 13 standardized test scores. The DE students retained the most (91.0%). AP student s enrolled at another post-UVU institution more (41.0%). AP students had the lowest need for remedial math (2.69%) and English (1.5%). AP students reached quantitative (88.4%) and English (95.0%) literacy the most.

CE and OC students tied for the most students earning a UVU certificate (0.6%). CE students earned the most UVU Associates (25.4%). DE students earned the most UVU Bachelor's (26.6%). AP students took the shortest time to earn an Associates (1.9 years). OC students took the shortest time to earn a Bachelor's (1.56 years). OC students earned the most post-UVU certificates (1.6%). AP students tied with OC students on earning the most Post-UVU Master's degrees (2.1%). AP students earned the most post-UVU Associates (5.4%), Bachelor's11.6%), and Doctorate degrees 1.7%).

Discussion of Report Findings in the Context of Recent Literature in Dual Education

Perhaps any data collection is better than no data collection in the initial stages of self-evaluation within dual enrollment programs. Hughes et al (2005) discussed the concern that "Most sites do not have systematic data collection procedures, and most of the data available at the sites indicate short-term outcome, making program evaluation difficult" (page3). Using existing data records is relatively inexpensive and is very common in this field of research Means et al. (2013).

A number of comparative studies have analyzed the differences in dual education versus non–dual educational student outcomes. Andrews (2004) found no differences in students' scores on a 100-point multiple choice exam. Drew (2010) summarized recent studies on Florida and New York City DE research which indicated that DE students are showing better results than non-DE students in many areas, yet selection biases were discussed as being a common problem in his and many other similar studies.

In this study, there were few controls that distinguished those students who chose to take CE, AP, DE, or OC dual enrollment courses and the comparative better results may well be attributed to the differences in students. For example, AP students scored much better and higher than almost all the other category of students. The fact that their standardized test scores were so much higher

confirms a certain degree of selection bias. The majority of students in this study were White. The proportion of non-White students is increasing in Utah and often they are less prepared for college and less inclined to consider attending. McComas (2010) studied 14,765 CE students taking courses in the academic year, 2001-2002, carefully controlling for diversity in their demographic characteristics and identified more Whites and slightly more females as having received the most benefit from participation. Efforts to reach out to non-White and less economically advantaged high school students holds the promise of equity, increased enrollments, and potentially increased outcomes.

The fact that the data used for this study is descriptive in nature does not discredit or nullify the value of descriptive findings in establishing a baseline from which to build strategic program improvements. Many published studies have documented better outcomes among dual enrollment students when compared to non-dual enrollment ones. For example, Allen and Dadgar (2012) reported that the "College Now may help reduce time to degree" for students (page 19). Similar findings were reported by McComas (2010) found that DE students completed a program at the higher rate of 23.9 percent (only 8.9% non-DE). DE students took an average of 2.6 to complete a degree and NON-DE took 3.5 years. IN fact, time to degree was shorter from CE, AP, and OC students in this study.

Struhl and Vargas (2012) reported on a longitudinal study of 16,454 dual enrolled and 16,454 non-dual enrolled Texas High School seniors (2003-2004 cohort). They found that students who completed a college course in high school were more likely to: attend college; persist in college; and 50 percent more likely to earn a college Associate's degree in Texas than those who did not.

Daly (2009) analyzed students enrolled in a small private college in New York. And reported a higher number of earned credits among dual enrolled students. This coincides with findings in this study for CE, AP, DE, and OC students who had earned more UVU credits than those not taking dual enrollment courses while in high school.

UVU's Concurrent Enrollment Evaluation Criteria

There are a number of best practices that UVU, local school districts, and the State of Utah have already implemented and a few specific areas where improvements may be needed.

Best practices

__NACEP accredited (2005)
__CE Counselor/Advisors in place (NACEP, 2011)
__Training and certification for new high school CE teachers (NACEP, 2011)
__Middle college program established (NACEP, 2011)
__Distance Education courses available (NACEP, 2011)
__All dual enrollment courses are synchronized with UVU course catalogue (NACEP, 2011)
__Proactive registration of interested high school students (NACEP, 2011)
__Advanced Placement credits accepted (NACEP, 2011)
__Dual education courses taught as much as possible as similar UVU courses (NACEP, 2011)
__Program evaluation performed (NACEP, 2011)
__Annual discipline specific training for CE instructors (NACEP, 2011)
__Dual education courses accepted statewide at all Utah institutions (NACEP, 2011)
__Full-time faculty make discipline specific site visits to high schools (NACEP, 2011)
__Utah laws ensure feasibility of ongoing dual enrollment success via state funding formulas
__Dual education opportunities available to all
__All dual education students are officially admitted to UVU (NACEP, 2011)
__All course prerequisites are to be met by students prior to their taking a dual education course (NACEP, 2011)
__Lobbying efforts with national elected leaders (NACEP, 2011)
__Dual enrollment is free to students (fees acceptable) Hoffman and Vargas (2010) and (Hughes et al., 2012)
__Annual Dual education training and conferences (NACEP, 2011)
__Collaboration with UVU institutional research (NACEP, 2011)
__End of course evaluation of each course section (NACEP, 2011)
__End of university studies evaluation of each student (NACEP, 2011)
__Administration of survey one year after student finishes course (NACEP, 2011)
__Administration of post high school four-year survey (NACEP questions; NACEP, 2011)
__Annual survey of principles and guidance counselors in participating high schools (NACEP, 2011)
__Dual education course students graded in same manner as UVU students (NACEP, 2011)
__State-wide coordination of dual enrollment terminology (Borden et al. ,2013)
__Buy in from all stake-holders: Governor, Legislators, Dept. of Educ., School districts, Principals, guidance councilors, university admissions, advisement, faculty, and staff (NCSL, 2012)
__Statewide college course delivery via closed-circuit television
__Establishment of academic entrance criteria
__Establishment of academic continuation requirements
__Placement of academic roadmaps (Wolverine Track) Ward and Vargas (2012)

UVU's Concurrent Enrollment Best Practices for the Future Strategies

__Access to high school student records K-20
__Track post-graduate employment
__State incorporation of K-20 and employment records (Data For Action, 2013 & Hoffman and Vargas, 2010)
__Early alert retention efforts begin in high school
__Outreach efforts to less-served demographics in population An (2012)
__Creation of dual education courses for high school students that have as much university "authenticity" as possible (Borden et al. ,2013)
__Coordination of high school math and English in senior year along with university math and English college freshman year Hoffman and Vargas (2010)
__Accountability measures for high school and post-secondary students, personnel and faculty
__State-wide goal of at least 12-20 dual enrollment credits taken per high school student (Hoffman and Vargas (2010)
__Remove funding penalties (Utah State subsidy) for schools with fewer participating students (Borden et al. ,2013)
__State subsidy for underprivileged students Mize (2013)
__Standardize all post-secondary institution's entrance eligibility standards (Borden et al.,2013)
__ Align dual enrollment with state priorities and policy initiatives (Karp, 2013)
__Eliminate restrictive eligibility requirements thus opening the door for many disadvantaged Utah students (CCRC ,2012, p.2)
__Redesign high school senior year with transition to post-secondary schools as a priority Use Florida's senior year "College Success Academies, (Hoffman, 2005 & CCRC, 2012, p. 6)
__State financial incentives for institutions that show improvements (NCSL, 2012)
__Promotion of Wolverine Track to high school students
__Get Utah to achieve The Data Quality Campaign (DQC) data standards like Arkansas and Delaware Hoffman and Vargas (2010)
__Utilize improved data management system to become more effective and accountable Hoffman and Vargas (2010)
__Survey parents of dual enrollment students using data to develop better parental involvement efforts Johnson and Brody (2006)
__Begin statewide, Longitudinal 6 year study of 10 graders who participate in dual enrollment using controls for those who do not (Speroni, 2011b)
__Strengthen all state-wide mathematics programs (Speroni, 2011a)
__Reach out to more first generation college students while in high school (see http://www.firstgenerationstudent.com/)
_Create a profile of the typical dual enrollment student (Hoffman, 2012)
_Create a profile of the typical successful dual enrollment student and match that type of student in controlled statistical analysis to other dual enrollment and non dual enrollment students
_Formation of state-wide dual enrollment evaluation group including USHE, Utah Dept. of Ed., Institutional research representatives, and UCEP members (based on: Allen 2010, Angrist and Data Quality Campaign 2012, Gray & Lewis 2013, Hoffman 2012, Hughes 2010, Jackson 2010, Karp et al. 2007, Karp et al. 2010, Kleiner & Lewis 2005, Mead 2009, Pischke 2009, Speroni 2011, Tab 2005, Thomas et al. 2013, Waits 2005, Speroni 2011a, & Swanson 2008)

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Appendix I:
Data Tables

Table 1

Table 1. Description of Numbers of Students Who took CE, AP, DE, and OC Courses				
	DE Credits Yes	AP Credits Yes	CE Credits Yes	OC Credits Yes
DE Credits Yes	5,307			
AP Credits Yes	467	5,074		
CE Credits Yes	2,738	1,628	12,360	
OC Credits Yes	1,834	524	1,719	8,686

Table 2

Table 2. Comparison of Means and Standard Deviations of UVU Students' High School Experience who took exclusively CE, AP, DE, or OC Courses				
Variables	**CE Only Means/Std. Devs. N=7,639**	**AP Only Means/Std. Devs. N=3,178**	**DE Only Means/Std. Devs. N=1,263**	**OC Only Means/Std. Devs. N=5,478**
Credits All Dual Ed. Earned while in High School Brought to UVU	7.90/5.60	11.59/8.22	29.83/31.68	16.17/21.52
Years After Graduation Until Starting at UVU	1.77/2.20	2.55/3.36	1.46/1.78	0.38/2.32

Table 3

Table 3. Comparison of Means and Standard Deviations of UVU Student Standardized Test Scores among those who took exclusively CE, AP, DE, or OC Courses				
Variables	**CE Only Means/Std. Devs. N=7,639**	**AP Only Means/Std. Devs. N=3,178**	**DE Only Means/Std. Devs. N=1,263**	**OC Only Means/Std. Devs. N=5,478**
ACT-English	20.05/4.81	24.93/4.44	20.36/4.69	20.04/4.87
ACT-Math	20.32/3.89	24.11/4.24	19.86/3.86	19.98/4.03
ACT-Reading	21.46/5.03	26.14/4.86	22.21/5.14	21.45/5.41
ACT-Science	21.08/3.67	24.33/3.87	21.61/3.60	20.90/4.06
ACT-Composite	20.70/3.63	24.76/3.56	20.96/3.62	20.62/3.92
Accuplacer-Reading Comp.	85.01/18.06	97.32/15.83	91.05/18.78	78.32/22.35
Accuplacer-Sentence Skills	90.51/16.86	103.95/15.03	90.76/17.59	82.34/19.70
Accuplacer-Arithmetic	74.74/29.59	89.97/26.96	70.02/29.98	66.43/30.39
Accuplacer-Elem Algebra	64.32/25.09	81.28/27.38	54.26/25.11	56.12/28.05
Accuplacer-College Level Math	31.68/13.82	42.76/20.18	28.80/15.70	30.14/15.59
Degrees-Reading Power	83.77/10.35	88.79/10.75	90.56/10.44	83.90/15.54
Compass-Writing Skills	78.10/20.54	85.23/18.63	79.52/22.66	77.94/22.40
Compass-Algebra	35.70/20.31	48.40/24.46	33.42/18.23	37.39/21.82
Compass-Pre Algebra	42.62/18.96	48.66/21.92	57.49/22.99	50.01/22.78

Table 4

Table 4. Comparison of Percentages, Means and Standard Deviations of UVU Student Performance among those who took exclusively CE, AP, DE, or OC Courses				
Variables	**CE Only Means/Std. Devs. N=7,639**	**AP Only Means/Std. Devs. N=3,178**	**DE Only Means/Std. Devs. N=1,263**	**OC Only Means/Std. Devs. N=5,478**
Enrolled After UVU	23.0%	38.0%	28.0%	34.0%
Retained to 2nd year	57.0%	60.0%	53.0%	49.0%
Took Remedial Math	32.0%	9.0%	19.0%	33.0%
Took Remedial English	17.0%	5.0%	9.0%	23.0%
Reached Quant. Literacy	54.0%	80.0%	39.0%	57.0%
Reached English Literacy	73.0%	89.0%	65.0%	71.0%
UVU Certificate	0.30%	2.0%	0.8%	0.40%
UVU Associate	14.0%	18.0%	4.0%	15.0%
UVU Bachelors	9.0%	16.0%	13.0%	26.0%
Overall UVU GPA	2.60/1.31	3.02/1.22	2.50/1.47	2.90/1.24
Years To UVU Associates	2.85/1.67	2.05/1.31	2.27/1.21	1.61/1.89
Years To UVU Bachelors	4.54/1.76	3.29/1.46	2.73/1.33	2.44/1.94

Table 5

Table 5. Comparison of Means and Standard Deviations of Post-UVU Student Performance among those who took exclusively CE, AP, DE, or OC Courses				
Variables	**CE Only Means/Std. Devs. N=7,639**	**AP Only Means/Std. Devs. N=3,178**	**DE Only Means/Std. Devs. N=1,263**	**OC Only Means/Std. Devs. N=5,478**
Yes/No Questions %				
Cert. Degree Elsewhere	0.80%	1.10%	1.70%	2.10%
Assoc. Degree Elsewhere	1.80%	3.40%	1.00%	3.30%
Bach. Degree Elsewhere	3.60%	8.60%	3.80%	6.60%
Master's Degree Elsewhere	0.80%	1.60%	1.00%	3.30%
Doctoral Degree Elsewhere	0.60%	1.40%	0.90%	0.70%

Table 6

Table 6. T-Test Comparison of Means and Standard Deviations of UVU Students who took exclusively "Yes CE" (N=7,639) and "No Any" did not take any form of dual enrollment (N=62,522) Courses			
Variables	**Yes CE Means/Std. Devs. N=7,639**	**Took no AP, DE, or OC Courses Means/Std. Devs. N=62,522**	**Significant Difference level**
Credits All Dual Ed. Earned in High School & Brought to UVU	7.90/5.60	na	na
Years After Graduation Until Starting at UVU	1.77/2.20	4.81/6.40	0.001
ACT-English	20.05/4.81	20.07/8.39	na
ACT-Math	20.32/3.89	20.05/8.44	0.05
ACT-Reading	21.46/5.03	21.50/5.65	na
ACT-Science	21.08/3.67	20.87/14.21	na
ACT-Composite	20.70/3.63	20.55/3.95	0.01
Accuplacer-Reading Comp.	85.01/18.06	82.86/20.54	0.001
Accuplacer-Sentence Skills	90.51/16.86	87.76/19.52	0.001
Accuplacer-Arithmetic	74.74/29.59	69.41/31.24	0.001
Accuplacer-Elem Algebra	64.32/25.09	61.35/27.24	0.001
Accuplacer-College Level Math	31.68/13.82	31.63/15.62	na
Degrees-Reading Power	83.77/10.35	84.29/12.05	0.05
Compass-Writing Skills	78.10/20.54	75.79/23.25	0.001
Compass-Algebra	35.70/20.31	32.88/19.28	0.001
Compass-Pre Algebra	42.62/18.96	43.54/20.27	0.05
Retained to 2nd year	0.57/0.50	0.51/0.50	0.001
Took Remedial Math	0.32/0.47	0.29/0.45	0.001
Took Remedial English	0.17/0.38	0.15/0.36	0.001
Reached Quant. Literacy	0.54/0.50	0.43/0.50	0.001
Reached English Literacy	0.73/0.44	0.64/0.48	0.001
Overall UVU GPA	2.60/1.31	2.41/1.41	0.001
Credits All UVU Total	66.38/46.37	61.75/52.93	0.001
UVU Certificate	0.003/0.58	0.003/0.52	na
UVU Associate	0.14/0.35	0.08/0.27	0.001
UVU Bachelors	0.09/0.29	0.10/0.30	na
Years To UVU Associates	2.85/1.67	2.70/1.68	0.01
Years To UVU Bachelors	4.54/1.76	3.67/1.76	0.001
Enrolled After UVU	0.23/0.42	0.32/0.47	0.001
Cert. Degree Elsewhere	0.80%	1.00%	na
Assoc. Degree Elsewhere	1.80%	2.00%	na
Bach. Degree Elsewhere	3.60%	5.70%	na
Master's Degree Elsewhere	0.80%	1.30%	na
Doctoral Degree Elsewhere	0.60%	1.10%	na

Table 7

Table 7. T-Test Comparison of Means and Standard Deviations of UVU Students who took exclusively "Yes AP" (N=3,178) and "No Any" did not take any form of dual enrollment (N=68,887) Courses			
Variables	**Yes AP Means/Std. Dvs. N=3,178**	**Took no CE, DE, or OC Courses Means/Std. Devs. N=68,887**	**Significant Difference level**
Credits All Dual Ed. Earned in High School & Brought to UVU	11.59/8.22	na	na
Years After Graduation Until Starting at UVU	2.55/3.36	4.42/6.16	0.001
ACT-English	24.93/4.44	19.78/7.77	0.001
ACT-Math	24.11/4.24	19.87/7.74	0.001
ACT-Reading	26.14/4.86	21.21/5.40	0.001
ACT-Science	24.33/3.87	20.7/12.93	0.001
ACT-Composite	24.76/3.56	20.32/3.73	0.001
Accuplacer-Reading Comp.	97.32/15.83	82.95/20.11	0.001
Accuplacer-Sentence Skills	103.95/15.03	87.80/19.07	0.001
Accuplacer-Arithmetic	89.97/26.96	69.84/30.97	0.001
Accuplacer-Elem Algebra	81.28/27.38	61.52/26.70	0.001
Accuplacer-College Level Math	42.76/20.18	31.34/15.05	0.001
Degrees-Reading Power	88.79/10.75	84.10/11.82	0.001
Compass-Writing Skills	85.23/18.63	76.03/22.98	0.001
Compass-Algebra	48.40/24.46	33.05/19.23	0.001
Compass-Pre Algebra	48.66/21.92	43.31/20.05	0.001
Retained to 2nd year	0.60/0.49	0.52/0.50	0.001
Took Remedial Math	0.09/0.28	0.30/0.50	0.001
Took Remedial English	0.05/0.22	0.16/0.36	0.001
Reached Quant. Literacy	0.80/0.40	0.43/0.50	0.001
Reached English Literacy	0.89/0.33	0.64/0.48	0.001
Credits All UVU Total	91.52/50.33	61.00/51.63	0.001
Overall UVU GPA	3.02/1.22	2.41/1.40	0.001
UVU Certificate	0.02/0.04	0.03/0.05	na
UVU Associate	0.18/0.38	0.09/0.28	0.001
UVU Bachelors	0.16/0.36	0.09/0.29	0.001
Years To UVU Associates	2.05/1.31	2.74/1.70	0.001
Years To UVU Bachelors	3.29/1.46	3.79/1.79	0.001
Enrolled After UVU	0.38/0.49	0.31/0.46	0.001
Cert. Degree Elsewhere	1.10%	1.00%	
Assoc. Degree Elsewhere	3.40%	1.90%	
Bach. Degree Elsewhere	8.60%	5.30%	
Master's Degree Elsewhere	1.60%	1.20%	
Doctoral Degree Elsewhere	1.40%	1.00%	

Table 8

Table 8. T-Test Comparison of Means and Standard Deviations of UVU Students who took exclusively "Yes DE" (N=1,263) and "No Any" did not take any form of dual enrollment (N=69,960) Courses			
Variables	**Yes DE Means/Std. Dvs. N=1,263**	**Took no CE, AP, or OC Courses Means/Std. Devs. N=69,960**	**Significant Difference level**
Credits All Dual Ed. Earned in High School & Brought to UVU	29.83/31.68	na	na
Years After Graduation Until Starting at UVU	1.46/1.78	4.39/6.11	0.001
ACT-English	20.36/4.69	20.21/7.81	na
ACT-Math	19.86/3.86	20.24/7.74	na
ACT-Reading	22.21/5.14	21.62/5.57	na
ACT-Science	21.61/3.60	21.01/12.74	na
ACT-Composite	20.96/3.62	20.70/3.95	na
Accuplacer-Reading Comp.	91.05/18.78	83.14/20.25	0.001
Accuplacer-Sentence Skills	90.76/17.59	88.04/19.23	na
Accuplacer-Arithmetic	70.02/29.98	70.30/31.11	na
Accuplacer-Elem Algebra	54.26/25.11	62.05/27.05	0.001
Accuplacer-College Level Math	28.80/15.70	31.79/15.46	na
Degrees-Reading Power	90.56/10.44	84.17/11.83	0.001
Compass-Writing Skills	79.52/22.66	76.07/22.92	0.001
Compass-Algebra	33.42/18.23	33.50/19.71	na
Compass-Pre Algebra	57.49/22.99	43.19/19.97	0.001
Retained to 2nd year	0.53/0.50	0.52/0.50	na
Took Remedial Math	0.19/0.39	0.29/0.46	0.001
Took Remedial English	0.09/0.28	0.15/0.36	0.001
Reached Quant. Literacy	0.39/0.49	0.45/0.50	0.001
Reached English Literacy	0.65/0.48	0.65/0.48	na
Credits All UVU Total	79.07/60.17	62.33/52.07	0.001
Overall UVU GPA	2.50/1.47	2.44/1.40	na
UVU Certificate	0.008/0.03	0.003/0.05	na
UVU Associate	0.04/0.18	0.09/0.29	0.001
UVU Bachelors	0.13/0.33	0.10/0.30	0.01
Years To UVU Associates	2.27/1.21	2.71/1.68	na
Years To UVU Bachelors	2.73/1.33	3.79/1.78	0.001
Enrolled After UVU	0.28/0.50	0.31/0.46	0.05
Cert. Degree Elsewhere	1.70%	1.00%	
Assoc. Degree Elsewhere	1.00%	2.10%	
Bach. Degree Elsewhere	3.80%	5.50%	
Master's Degree Elsewhere	1.00%	1.20%	
Doctoral Degree Elsewhere	0.90%	1.00%	

Table 9

Table 9. T-Test Comparison of Means and Standard Deviations of UVU Students who took exclusively Yes Took On Campus N=5,478 and No did not take any form of dual enrollment (N=58,062) Courses			
Variables	**Yes OC Means/Std. Dvs. N=5,478**	**Took no CE, AP, or DE Courses Means/Std. Devs. N=58,062**	**Significant Difference level**
Credits All Dual Ed. Earned in High School & Brought to UVU	16.17/21.52	na	na
Years After Graduation Until Starting at UVU	0.38/2.32	4.97/6.52	0.001
ACT-English	20.04/4.87	19.60/8.55	0.05
ACT-Math	19.98/4.03	19.67/8.67	na
ACT-Reading	21.45/5.41	21.05/5.21	0.001
ACT-Science	20.90/4.06	20.53/14.83	na
ACT-Composite	20.62/3.92	20.14/3.75	0.001
Accuplacer-Reading Comp.	78.32/22.35	82.50/20.52	0.001
Accuplacer-Sentence Skills	82.34/19.70	87.28/19.47	0.001
Accuplacer-Arithmetic	66.43/30.39	68.81/31.17	na
Accuplacer-Elem Algebra	56.12/28.05	60.76/27.01	na
Accuplacer-College Level Math	30.14/15.59	31.18/15.22	0.001
Degrees-Reading Power	83.90/15.54	84.12/12.06	0.001
Compass-Writing Skills	77.94/22.40	75.54/23.30	0.001
Compass-Algebra	37.39/21.82	32.50/19.02	0.001
Compass-Pre Algebra	50.01/22.78	43.15/20.06	0.001
Retained to 2nd year	0.49/0.50	0.51/0.50	0.05
Enrolled After UVU	0.34/0.48	0.32/0.47	0.001
Took Remedial Math	0.33/0.47	0.31/0.46	0.001
Took Remedial English	0.23/0.42	0.16/0.36	0.001
Reached Quant. Literacy	0.57/0.50	0.41/0.49	0.001
Reached English Literacy	0.71/0.45	0.63/0.48	0.001
Overall UVU GPA	2.90/1.24	2.38/1.41	0.001
Credits All UVU Total	92.85/63.01	59.72/52.32	0.001
UVU Certificate	0.004/0.05	0.003/0.05	na
UVU Associate	0.15/0.36	0.08/0.27	0.001
UVU Bachelors	0.26/0.44	0.10/0.29	0.001
Years To UVU Associates	1.61/1.89	2.78/1.71	0.001
Years To UVU Bachelors	2.44/1.94	3.73/1.79	0.001
Cert. Degree Elsewhere	2.10%	1.00%	
Assoc. Degree Elsewhere	3.30%	2.00%	
Bach. Degree Elsewhere	6.60%	5.60%	
Master's Degree Elsewhere	3.30%	1.30%	
Doctoral Degree Elsewhere	0.70%	1.10%	

Table 10

Table 10. Comparison of Means and Standard Deviations of UVU Students who Earned at Least 20 CE Credits (N=351) and those who took no other Dual Enrollment Credits (N=62,522) Courses			
Variables	**Yes CE Means/Std. Devs. N=351**	**Took no AP, DE, or OC Courses Means/Std. Devs. N=62,522**	
Credits All Dual Ed. Earned in High School & Brought to UVU	24.05/4.30	na	
Years After Graduation Until Starting at UVU	1.49/1.98	4.81/6.40	
ACT-English	20.62/4.71	20.07/8.39	
ACT-Math	22.22/4.19	20.05/8.44	
ACT-Reading	21.98/3.77	21.50/5.65	
ACT-Science	22.20/3.95	20.87/14.21	
ACT-Composite	21.68/3.77	20.55/3.95	
Accuplacer-Reading Comp.	84.31/21.70	82.86/20.54	
Accuplacer-Sentence Skills	93.41/17.81	87.76/19.52	
Accuplacer-Arithmetic	83.74/27.38	69.41/31.24	
Accuplacer-Elem Algebra	69.97/22.80	61.35/27.24	
Accuplacer-College Level Math	32.97/13.12	31.63/15.62	
Degrees-Reading Power	84.89/8.50	84.29/12.05	
Compass-Writing Skills	77.74/18.77	75.79/23.25	
Compass-Algebra	46.65/24.62	32.88/19.28	
Compass-Pre Algebra	46.24/20.57	43.54/20.27	
Retained to 2nd year	56.0%	51.0%	
Took Remedial Math	19.7%	29.0%	
Took Remedial English	9.1%	15.0%	
Reached Quant. Literacy	74.1%	43.0%	
Reached English Literacy	80.0%	64.0%	
Overall UVU GPA	2.82/1.23	2.41/1.41	
Credits All UVU Total	88.28/46.04	61.75/52.93	
UVU Certificate	0.6%	0.3%	
UVU Associate	25.4%	0.8%	
UVU Bachelors	13.1%	10.0%	
Years To UVU Associates	2.38/1.60	2.70/1.68	
Years To UVU Bachelors	4.07/1.61	3.67/1.76	
Enrolled After UVU	25.0%	32.0%	
Cert. Degree Elsewhere	1.4%	1.00%	
Assoc. Degree Elsewhere	3.7%	2.00%	
Bach. Degree Elsewhere	4.0%	5.70%	
Master's Degree Elsewhere	0.9%	1.30%	
Doctoral Degree Elsewhere	0.6%	1.10%	

Table 11

Table 11. Comparison of Means and Standard Deviations of UVU Students who Earned at Least 20 AP Credits (N=483) and those who took no other Dual Enrollment Credits (N=68,887)			
Variables	**Yes AP Means/Std. Dvs. N=483**	**Took no CE, DE, or OC Courses Means/Std. Devs. N=68,887**	
Credits All Dual Ed. Earned in High School & Brought to UVU	27.34/7.65	na	
Years After Graduation Until Starting at UVU	3.18/3.89	4.42/6.16	
ACT-English	37.82/3.69	19.78/7.77	
ACT-Math	26.54/3.85	19.87/7.74	
ACT-Reading	29.00/3.81	21.21/5.40	
ACT-Science	26.54/3.78	20.7/12.93	
ACT-Composite	27.63/3.01	20.32/3.73	
Accuplacer-Reading Comp.	111.05/8.24	82.95/20.11	
Accuplacer-Sentence Skills	114.58/6.31	87.80/19.07	
Accuplacer-Arithmetic	108.96/14.52	69.84/30.97	
Accuplacer-Elem Algebra	95.87/26.26	61.52/26.70	
Accuplacer-College Level Math	55.89/23.51	31.34/15.05	
Degrees-Reading Power	97.57/2.87	84.10/11.82	
Compass-Writing Skills	95.86/5.47	76.03/22.98	
Compass-Algebra	58.70/24.03	33.05/19.23	
Compass-Pre Algebra	75.20/24.95	43.31/20.05	
Retained to 2nd year	61.0%	52.0%	
Took Remedial Math	2.69%	30.0%	
Took Remedial English	1.5%	16.0%	
Reached Quant. Literacy	88.4%	43.0%	
Reached English Literacy	95.0%	64.0%	
Credits All UVU Total	117.1/49.43	61.0%	
Overall UVU GPA	3.22/1.14	2.41/1.40	
UVU Certificate	0.4%	3.0%	
UVU Associate	22.4%	9.0%	
UVU Bachelors	20.9%	9.0%	
Years To UVU Associates	1.90/1.28	2.74/1.70	
Years To UVU Bachelors	3.28/1.44	3.79/1.79	
Enrolled After UVU	41.0%	31.%	
Cert. Degree Elsewhere	0.8%	1.0%	
Assoc. Degree Elsewhere	5.4%	1.9%	
Bach. Degree Elsewhere	11.6%	5.3%	
Master's Degree Elsewhere	2.1%	1.2%	
Doctoral Degree Elsewhere	1.7%	1.0%	

Table 12

Table 12. Comparison of Means and Standard Deviations of UVU Students who Earned at Least 20 DE Credits (N=545) and those who took no other Dual Enrollment Credits (N=69,960) Courses			
Variables	**Yes DE Means/Std. Dvs. N=545**	**Took no CE, AP, or OC Courses Means/Std. Devs. N=69,960**	
Credits All Dual Ed. Earned in High School & Brought to UVU	59.56/27.21	na	
Years After Graduation Until Starting at UVU	Na	4.39/6.11	
ACT-English	19.07/4.68	20.21/7.81	
ACT-Math	18.36/4.01	20.24/7.74	
ACT-Reading	19.69/6.10	21.62/5.57	
ACT-Science	20.62/3.48	21.01/12.74	
ACT-Composite	19.21/4.19	20.70/3.95	
Accuplacer-Reading Comp.	91.26/18.32	83.14/20.25	
Accuplacer-Sentence Skills	91.85/16.69	88.04/19.23	
Accuplacer-Arithmetic	70.05/30.56	70.30/31.11	
Accuplacer-Elem Algebra	51.09/24.10	62.05/27.05	
Accuplacer-College Level Math	27.39/11.40	31.79/15.46	
Degrees-Reading Power	92.40/11.27	84.17/11.83	
Compass-Writing Skills	81.74/21.39	76.07/22.92	
Compass-Algebra	36.37/20.47	33.50/19.71	
Compass-Pre Algebra	64.32/22.27	43.19/19.97	
Retained to 2nd year	91.0%	0.52/0.50	
Took Remedial Math	24.4%	0.29/0.46	
Took Remedial English	12.1%	0.15/0.36	
Reached Quant. Literacy	50.6%	0.45/0.50	
Reached English Literacy	83.3%	0.65/0.48	
Credits All UVU Total	114.65/51.71	62.33/52.07	
Overall UVU GPA	2.68/1.43	2.44/1.40	
UVU Certificate	0.0%	0.003/0.05	
UVU Associate	4.40%	0.09/0.29	
UVU Bachelors	26.6%	0.10/0.30	
Years To UVU Associates	2.58/1.34	2.71/1.68	
Years To UVU Bachelors	2.68/1.33	3.79/1.78	
Enrolled After UVU	19.0%	0.31/0.46	
Cert. Degree Elsewhere	1.30%	1.00%	
Assoc. Degree Elsewhere	0.40%	2.10%	
Bach. Degree Elsewhere	1.30%	5.50%	
Master's Degree Elsewhere	0.40%	1.20%	
Doctoral Degree Elsewhere	0.40%	1.00%	

Table 13

Table 13. Comparison of Means and Standard Deviations of UVU Students who Earned at Least 20 OC Credits (N=1,213) and those who took no other Dual Enrollment Credits (N=58,062)			
Variables	**Yes OC Means/Std. Dvs. N=1,213**	**Took no CE, AP, or DE Courses Means/Std. Devs. N=58,062**	
Credits All Dual Ed. Earned in High School & Brought to UVU	46.64/28.58	na	
Years After Graduation Until Starting at UVU	1.02/5.54	4.97/6.52	
ACT-English	20.46/4.45	19.60/8.55	
ACT-Math	19.87/4.17	19.67/8.67	
ACT-Reading	21.63/5.58	21.05/5.21	
ACT-Science	20.81/3.95	20.53/14.83	
ACT-Composite	20.81/3.78	20.14/3.75	
Accuplacer-Reading Comp.	78.23/23.24	82.50/20.52	
Accuplacer-Sentence Skills	81.45/22.51	87.28/19.47	
Accuplacer-Arithmetic	70.17/31.87	68.81/31.17	
Accuplacer-Elem Algebra	57.89/29.98	60.76/27.01	
Accuplacer-College Level Math	32.10/18.33	31.18/15.22	
Degrees-Reading Power	81.79/17.25	84.12/12.06	
Compass-Writing Skills	75.53/24.15	75.54/23.30	
Compass-Algebra	37.35/23.18	32.50/19.02	
Compass-Pre Algebra	52.13/22.67	43.15/20.06	
Retained to 2nd year	69.0%	51.0%	
Enrolled After UVU	25.0%	32.0%	
Took Remedial Math	36.44	31.0%	
Took Remedial English	26.55%	16.0%	
Reached Quant. Literacy	61.50%	41.0%	
Reached English Literacy	76.26%	63.0%	
Overall UVU GPA	2.97/1.20	2.38/1.41	
Credits All UVU Total	115.44/62.99	59.72/52.32	
UVU Certificate	0.60%	0.30%	
UVU Associate	14.34%	8.0%	
UVU Bachelors	28.19%	10.0%	
Years To UVU Associates	1.56/1.54	2.78/1.71	
Years To UVU Bachelors	2.24/1.69	3.73/1.79	
Cert. Degree Elsewhere	1.60%	1.00%	
Assoc. Degree Elsewhere	1.30%	2.00%	
Bach. Degree Elsewhere	3.50%	5.60%	
Master's Degree Elsewhere	2.10%	1.30%	
Doctoral Degree Elsewhere	0.40%	1.10%	

Table 14

Table 14. Comparison of Means and Standard Deviations of UVU Students who Earned at Least 20 Dual Education Credits in: CE (N=351) CE, AP (N=483), DE (N=545), or OC (N=1,213)				
Variables	**Yes CE Means/Std. Devs. N=351**	**AP Means/Std. Devs. N=483**	**DE Means/Std. Devs. N=545**	**OC Means/Std. Devs. N=1,213**
Credits All Dual Ed. Earned in High School & Brought to UVU	24.05/4.30	27.34/7.65	59.56/27.21	46.64/28.58
Years After Graduation Until Starting at UVU	1.49/1.98	3.18/3.89	Na	1.02/5.54
ACT-English	20.62/4.71	37.82/3.69	19.07/4.68	20.46/4.45
ACT-Math	22.22/4.19	26.54/3.85	18.36/4.01	19.87/4.17
ACT-Reading	21.98/3.77	29.00/3.81	19.69/6.10	21.63/5.58
ACT-Science	22.20/3.95	26.54/3.78	20.62/3.48	20.81/3.95
ACT-Composite	21.68/3.77	27.63/3.01	19.21/4.19	20.81/3.78
Accuplacer-Reading Comp.	84.31/21.70	111.05/8.24	91.26/18.32	78.23/23.24
Accuplacer-Sentence Skills	93.41/17.81	114.58/6.31	91.85/16.69	81.45/22.51
Accuplacer-Arithmetic	83.74/27.38	108.96/14.52	70.05/30.56	70.17/31.87
Accuplacer-Elem Algebra	69.97/22.80	95.87/26.26	51.09/24.10	57.89/29.98
Accuplacer-College Level Math	32.97/13.12	55.89/23.51	27.39/11.40	32.10/18.33
Degrees-Reading Power	84.89/8.50	97.57/2.87	92.40/11.27	81.79/17.25
Compass-Writing Skills	77.74/18.77	95.86/5.47	81.74/21.39	75.53/24.15
Compass-Algebra	46.65/24.62	58.70/24.03	36.37/20.47	37.35/23.18
Compass-Pre Algebra	46.24/20.57	75.20/24.95	64.32/22.27	52.13/22.67
Retained to 2nd year	56.0%	61.0%	91.0%	69.0%
Enrolled After UVU	25.0%	41.0%	19.0%	25.0%
Took Remedial Math	19.7%	2.69%	24.4%	25.0%
Took Remedial English	9.1%	1.5%	12.1%	36.44
Reached Quant. Literacy	74.1%	88.4%	50.6%	26.55%
Reached English Literacy	80.0%	95.0%	83.3%	61.50%
Overall UVU GPA	2.82/1.23	3.22/1.14	2.68/1.43	2.97/1.20
Credits All UVU Total	88.28/46.04	117.1/49.43	114.65/51.71	115.44/62.99
UVU Certificate	0.6%	0.4%	0.0%	0.6%
UVU Associate	25.4%	22.4%	4.40%	0.60%
UVU Bachelors	13.1%	20.9%	26.6%	14.34%
Years To UVU Associates	2.38/1.60	1.90/1.28	2.58/1.34	28.19%
Years To UVU Bachelors	4.07/1.61	3.28/1.44	2.68/1.33	1.56/1.54
Cert. Degree Elsewhere	1.4%	0.8%	1.30%	1.60%
Assoc. Degree Elsewhere	3.7%	5.4%	0.40%	1.30%
Bach. Degree Elsewhere	4.0%	11.6%	1.30%	3.50%
Master's Degree Elsewhere	0.9%	2.1%	0.40%	2.10%
Doctoral Degree Elsewhere	0.6%	1.7%	0.40%	0.40%

End of Tables