

Building a 21st Century Education System:

***Accelerated Learning Options for
Colorado's High School Students***

A Review of the Issues for Parents and Priorities for Legislators

February 2013

Agenda

- Introduction
 - Accelerated Learning Is growing in importance not just for gifted students, but for all Colorado high school students
 - K-12 gifted education is critical to Colorado's economic growth
- Review of the Main Acceleration Options (Description, Evidence of Efficacy, and Concerns)
 - Honors Classes
 - Advanced Placement Classes
 - Concurrent Enrollment
 - Online Classes
 - International Baccalaureate Program
 - Early College High School
 - Summary Comparison and Trade-Offs
- Priorities for Legislative Action to Remove Barriers to Wider Use of Accelerated Education Options in Colorado
- Conclusions
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Introduction

- Accelerated learning options are of rapidly growing importance to all Colorado's students and their parents
 - Accelerated learning is of growing importance to all high school students. According to the most recent data from the National Center for Education Statistics, 9.3% of the U.S. high school class of 2009 had taken at least one Concurrent Enrollment class; 36.3% an AP class; and 1.9% an IB class.
 - According to the NCES, the number of high school students enrolled in online courses increased from 214,140 in 2002/03 to 1,348,920 in 2009/10.
- Accelerated Learning Options are of particular importance to two groups whose educational success or failure will have a disproportionate impact on Colorado's future economic growth and fiscal health: at risk students and gifted students – together, they account for 50% of all students
- Under Colorado Law, "Gifted and Talented Children means those persons between the ages of five and twenty one whose abilities, talents, and potential for accomplishment are so exceptional or developmentally advanced that they require special provisions to meet their educational programming needs."

How Many Gifted K-12 Students Are There in Colorado?

- Under Colorado Law, “Gifted students are capable of high performance, exceptional production, or exceptional learning behavior by virtue of a combination of these areas of giftedness:”
 - General or Specific Intellectual Ability
 - *“Demonstrated by advanced level on performance assessments or 95th percentile and above on standardized cognitive tests.”*
 - Specific Academic Aptitude
 - *“Demonstrated by advanced level on performance assessments or 95th percentile and above on standardized cognitive tests.”*
 - Creative or Productive Thinking
 - *“Demonstrated by advanced level on performance assessments or 95th percentile and above on standardized tests of creative/critical skills or creativity/critical thinking.”*
 - Leadership Abilities
 - *“Demonstrated by advanced level on performance assessments or 95th percentile and above on standardized leadership tests.”*
 - Visual Arts, Performing Arts, Musical, or Psychomotor Abilities
 - *“Demonstrated by an advanced level on performance talent assessments, or 95th percentile and above on standardized talent tests.”*

Number of Gifted Students in Colorado (cont'd)

- A key issue when identifying the number of gifted K-12 students in Colorado is that all districts (Administrative Units) have not implemented mandatory early identification testing (e.g., in grades two and five)
- However, we can extrapolate from the results in Jefferson County, which conducts mandatory testing to identify gifted students
- In Jeffco, approximately ten percent of students have been identified as gifted – about the same percentage as the SPED population (the overlap between the two groups is small)
 - The 10% identification rate reflects the use of multiple criteria, each of which individually has a 95% threshold level
- In the 2011/2012 school year, there were 854,265 public K-12 students in Colorado
- Applying the 10% estimate from Jeffco implies a statewide gifted population of 85,427 students

Linkages Between Gifted Education and Economic Growth

- At the macro level, there are many studies that link improved education performance to higher economic growth, through a complex mix of channels
 - For example, see the following research papers:
 - *“Education and Economic Growth” [a research overview] by Stevens and Weale*
 - *“The Causal Impact of Education on Economic Growth: Evidence from the United States” by Aghion, Boustan, Hoxby, and Vandembussche*
- Research also shows that the optimal mix of education investments varies with the level of economic development
 - At low levels of development (where most industries are far from the global technology frontier), increasing educational quantity (average years of schooling) and basic proficiency have high payoffs
 - At higher levels of development, where average years of schooling are already high, and technological innovation rather than catch-up is the critical growth driver, improving educational quality has the highest payoff
 - *E.g., “The Role of Education Quality in Economic Growth” by Hanushek and Wossman*
 - *“The High Cost of Low Educational Performance” published by the OECD*

Linkages Between Gifted Education and Economic Growth (cont'd)

- In our digitized global economy, there is evidence of an increasingly close linkage between wealth creation and superior cognitive skills
 - See, for example, “Of Brainiacs and Billionaires” by Jonathan Wai, and “The Best and The Rest: Revisiting the Norm of Normality of Individual Performance” by O’Boyle and Aguinis
- In a recent interview, Norman Augustine, former CEO of Lockheed Martin, summed up the implications of this trend:
 - “One of the many reasons that America should care about the education of our most talented students is that these individuals will, in their lifetimes, disproportionately create jobs for others, and jobs are the basis of an individual's standard of living and to a not inconsiderable degree to our national quality of life. The jobs such students will create through the creation of knowledge and the application of innovation are also important to our government, since such jobs provide the tax base that permits the federal system to provide national security, healthcare, education and more...Simply put, it is in the public's interest, let alone being a matter of equity, that we permit the most talented individuals in our society to make the most of their abilities along with everyone else, particularly because doing so can impact the world at large in such a positive manner.”
- This is also consistent with Governor Hickenlooper’s Colorado Innovation Index, which includes talent (along with capital, ideas, and entrepreneurship) as one of four critical drivers of the state’s future economic growth, and with the goal of the Governor’s Colorado Blueprint to have the state “be recognized as a nucleus of innovation, technology and economic growth.”
- Finally, as a practical matter, the innovative companies Colorado is trying to attract also have large numbers of employees that are parents of gifted children, who will closely examine the state’s accelerated learning options

Pre-Empting Two Arguments Against Gifted Education

- Two arguments are sometimes made against gifted education
 - “Gifted kids will do fine on their own”
 - “Gifted education is elitist”
- Judging from our collective behavior, Coloradans clearly do not believe that our most gifted young athletes and artists will do just fine on their own, or that providing special support for their development should be rejected on the grounds that it is elitist. Why is this not also true for our most cognitively gifted children, upon whom our future economic growth and company success disproportionately depend?
 - Athletically, artistically, and cognitively gifted children *all* need extra support to fully develop their exceptional potential into true talent – the ability to consistently deliver superior performance. In many cases, the support these differently gifted children require actually has a lot in common
 - For example, whether they are athletically, artistically, or cognitively gifted, they all need to learn to cope with the emotional pressure of high expectations, to be resilient in the face of failure, to have the grit and persistence to overcome challenges, and to play well on mixed ability teams
 - But let us all agree – regardless of their nature, exceptional gifts do not turn into exceptional talent without exceptional coaching and support
- Finally, improving gifted education may also help to improve the education performance of at-risk students
 - JAGC’s initial research has found evidence that at least some of the same factors that drive improved median growth performance for gifted students also drive improved growth performance for students eligible for free and reduced meals

In This Review, We Consider Six Accelerated Learning Options

- **Honors Classes** are designed to offer advanced students a more in depth and stimulating educational experience in a given subject. There is no standard definition for an honors class.
- **Advanced Placement Classes** are those which follow a “college level” curriculum approved by the College Board, which also administers, for a fee, voluntary standardized national tests to measure a student’s performance in an AP class (in addition to his or her grades). Depending on the score achieved on such a test, a post-secondary institution may grant college level credit to a student.
- **Dual or Concurrent Enrollment Classes** are provided to high school students by accredited institutions of higher learning. These classes can be delivered at a high school or a college campus. A student who successfully completes a class simultaneously receives credits on both high or her high school and a college transcript. In some cases, those college credits may be transferrable to another post-secondary institution, which can substantially reduce the cost of obtaining a college degree.
- **Online Classes** are distinguished by their primary mode of instructional delivery, and could, in theory, include Honors, AP, and Concurrent Enrollment courses, as well as courses resulting in a certificate but not credit
- **International Baccalaureate** is a highly structured program covering grades 9 and 10 (for “pre-IB”) and 11 and 12 (for the “IB Diploma Program”). IB Diploma candidates must pass a series of final examinations. If sufficiently high grades are achieved, college credit may be granted by a post-secondary institution.
- **Early College High Schools** are small (often charter) schools designed so that students can earn both a high school diploma and an Associate’s degree or up to two years of credit toward a Bachelor’s degree. They are based on the principle that academic rigor, strong emotional and social support, and the opportunity to save time and money, is a powerful motivator for students to work hard and meet serious intellectual challenges.

Honors Classes

- Honors Classes are designed to offer advanced students a more in depth and stimulating educational experience in a given subject. There is no standard definition for an honors class
- In terms of the efficacy of honors classes, the College Board has noted that “Studies have shown that the rigor of a student's high school curriculum is the single best predictor of success in college. In his seminal 2006 study, The Tool Box Revisited: Paths to Degree Completion from High School Through College, Clifford Adelman demonstrated that the academic intensity of a high school curriculum is essential to student success in college
- The key strength of honors classes is that they often allow teachers to flexibly and deeply engage students in a subject where they have deep knowledge. It is often an honors class that first ignites a student’s passion for a subject. In some cases (e.g., English and Social Studies), honors classes can also employ the type of in-depth writing assignments found in college courses
- The main concerns regarding honors classes is the lack of dual (high school and college) credit for taking them, and the wide variety of curriculum design and teaching quality one encounters across high schools, even in the same subject

Advanced Placement Classes

- Advanced Placement Classes are those which follow a “college level” curriculum approved by the College Board, which also administers, for a fee, voluntary standardized national tests to measure a student’s performance in an AP class (in addition to his or her grades). Depending on the score achieved on such a test, a post-secondary institution may grant college level credit to a student
- The key strengths of AP classes are that they follow a consistent, rigorous curriculum, and allow students to take an optional national test at the end of the course, which, depending on the score achieved and the policy of a post-secondary institution, may result in the granting of college credit, which can shorten the time and reduce the cost required to obtain an associate or bachelor degree

Advanced Placement Classes (cont'd)

- Based on research it has conducted and/or sponsored, the College Board also asserts that taking AP classes has a beneficial impact on various post-high school outcomes, such as college attendance, grade point average, and probability of graduating within a given period of time
 - E.g., “A Comparison of College Performance of Matched AP and Non-AP Student Groups” by Murphy and Dodd; “The Relationship Between AP Exam Performance and College Outcomes” by Mattern, Shaw, and Xiong; and “College Outcome Comparisons by AP and Non-AP High School Experiences” by Hargrove, Grodin, and Dodd
- However, critics have charged that this research has failed to adequately control for other factors (e.g., family background, high school quality, non-cognitive/emotional and social strengths) that are also causally related to the measured outcomes
 - E.g., “The Advanced Placement Performance Advantage: Fact or Fiction?” by Klopfenstein and Thomas; and “Assessing the Effects of Advanced Placement Policies” by Lauren Linzmeier
- Critics have also charged that AP classes “sacrifice depth for breadth”, and that teachers are forced to limit discussion and writing assignments because of a need to “teach to the exam”
 - See, for example, “AP: A Critical Examination of the Advanced Placement Program” by Philip Sadler, a professor at Harvard University, and “Learning and Understanding: Improving Advanced Study of Mathematics and Science in U.S. High Schools” by the National Research Council (NRC)
 - *E.g., this is why Concord-Carlisle High School, outside of Boston, restricts its offering of AP classes in favor of a wider range of honors classes*

Advanced Placement Classes (cont'd)

- An unfavorable comparison of AP and Dual Enrollment was put forth by Rob Jenkins, in the 14 January 2013 *Chronicle of Higher Education*:
 - “Can we please dispense with the fiction that Advanced Placement courses in any way resemble college courses? Because that’s what it is—a fiction, carefully crafted by the College Board to promote its AP franchise to the detriment of other, better options. Specifically, I’m talking about dual enrollment, a program in many states that allows qualified high-school seniors (and in some cases, juniors) to take actual college courses. Typically those courses count for both high school and college credit, and are directly transferable into the state-university system (and often beyond). In many states, like mine, tuition and fees for dual-enrollment students are minimal. I speak as someone who has had a great deal of experience with both AP and DE. As a college administrator and professor, I’ve dealt with hundreds of students who had, or were seeking, AP credit. I’ve also taught hundreds (probably well over 1,000) dual-enrollment students. Moreover, as a parent, I have four children who have all taken at least one AP course, and I am now on my third dual-enrollment student.”
 - “Anecdotally speaking, all three of my kids have found dual enrollment to be far superior as an educational experience to taking AP courses in high school. It’s not that AP courses are bad. As high-school courses go, they’re well above average because they usually have the best teachers and the best students. But the point is, they’re high-school classes, not college classes. As someone who has taught primarily first-year college students for nearly three decades, I can tell you that one of the biggest adjustments they have to make academically is to the relative paucity of graded assignments. In high school they’re used to getting three or four grades per week. This means that they (and their parents) can easily track their progress from week to week, and the fact that they might end the semester with 45 or 50 grades means that a few low ones won’t matter much. College is a completely different story. In my composition course, students have exactly seven grades: six essays plus a class-participation grade. In a history, political science, or psychology course, they might have even fewer—two or three tests plus maybe a term paper. That takes some getting used to. And what do AP teachers typically do in order to make their classes more “rigorous” and “collegiate”? They give the students even more assignments than a regular high-school class, which translates into even more grades. Obviously, rather than making their classes more college-like, those teachers are going in the opposite direction. And much of the work they assign, quite frankly, isn’t terribly demanding. A lot of it is just busy work, much like the work students would have in a non-AP class, except more of it.”
- In fairness to AP, however, it is important to not that following the 2002 publication of the National Research Council critique of AP, the College Board embarked upon the redesign of a number of AP courses; however, a decade later, only a few of these course redesigns have actually been implemented

Advanced Placement Classes (cont'd)

- Another concern that has been expressed about AP classes is the declining average scores achieved by students as schools have expanded the number of AP classes they offer. Consider the following table:

State	Pct HS Graduates taking AP test in 2011	Increase in Pct taking AP Test Since 2001	Pct of 2011 AP Test Takers Scoring 3, 4, or 5	Change in Pct 3/4/5 Scores since 2001	Pct of 4&5 Scores in 2011
Colorado	36.1%	15.9%	22.3%	(4.1%)	33.4%
Connecticut	35.2%	15.0%	25.3%	0.1%	45.8%
Massachusetts	36.4%	16.0%	25.5%	(1.5%)	45.4%
Texas	32.8%	14.5%	16.7%	(6.5%)	24.2%

- Some observers have questioned whether there are a sufficient number of instructors qualified to teach the number of AP classes that are now offered
- On the other hand, using 2010/2011 data, the negative correlation between the percent of 4&5 scores and a state's percentage of free and reduced lunch eligible students is very high (-.78). This suggests that AP teaching quality may be a less important issue than some have asserted. Declining AP scores may simply reflect the fact that a wider range of students than in the past are being encouraged to take AP classes and tests
- A final concern with AP is that there are no uniform policies with respect to the test score required for a post-secondary institution to provide college credit for an AP class. While the College Board "suggests" a cut score of 3, many universities require a 4 or 5, or refuse to grant college credit for high school AP.

Dual/Concurrent Enrollment

- Dual or Concurrent Enrollment Classes are provided to high school students by accredited institutions of higher learning. About 75% of these courses are delivered at a high school, and 25% on a college campus. A student who successfully completes a dual enrollment class simultaneously receives credits on both her high school and her college transcript. In some cases, those college credits may be transferrable to another post-secondary institution. Through dual enrollment, a student can also substantially reduce the cost of obtaining a college degree.
- With the growth in dual/concurrent course enrollment, some excellent reviews of best practices and lessons learned have recently been published
 - E.g., “Different Approaches to Dual Enrollment”, by Edwards, Hughes, and Weisberg of the Community College Research Center at Columbia University; “Dual Enrollment: Lessons Learned on School-Level Implementation” by Cassidy, Keating and Young of SRI International; “Dual Enrollment: Theory, Research, Practice and Issues” by Robert Koelling; and “Dual Enrollment: A Comprehensive Literature Review & Bibliography” by Drew Allen of the City University of New York
- As is the case with AP Classes, supporters of dual enrollment have claimed that these classes have a beneficial impact on various post-high school outcomes, such as college attendance, grade point average, and probability of graduating within a given period of time. One important difference is that DE classes seem to have more benefits for at risk students than AP classes
 - E.g., “High Schoolers in College” by June Kronholz; “Taking College Courses in High School: A Strategy for College Readiness (College Outcomes of Dual Enrollment in Texas)” by Struhl and Vargas; “Academic Aspirations and Expectations: High School Guidance Counselor Perceptions of the Benefits Students Receive by Participating in Dual Enrollment” by Marjorie Mattis; “Dual Enrollment: A Strategy for Educational Advancement of All Students” by Barnett and Stamm; and “Determinants of Students Success: The Role of Advanced Placement and Dual Enrollment Programs” by Cecilia Speroni
 - This research is subject to some of the same methodology concerns as the research on AP classes

Dual/Concurrent Enrollment (cont'd)

- A number of concerns have been raised about dual/concurrent enrollment classes:
 - Whether classes taught in high schools (which are less disruptive to student schedules) have the same impact as those taught on college campuses (e.g., Speroni's research found that the latter had a stronger effect on positive outcomes)
 - *This includes issues related to similarity of course content (e.g., same syllabus?), the effect of classroom peers (college versus solely high school students), and the instructional methods used (e.g., frequency of feedback in a high school versus college setting)*
 - *How and how fast the new Common Core Standards will affect dual enrollment class syllabi*
 - The quality of course instructors, specifically whether high school teachers certified as college instructors are of equivalent quality with on-campus college instructors (with the important exception of high school teachers who also teach on-campus college courses)
 - At some schools, dual enrollment classes are not weighted as highly as AP or Honors classes, creating conflicts related to class rank and awards (including scholarships)
 - *Taking too many Dual Enrollment Classes may also cause a high school student to be classified as a transfer student by a university, which may disqualify him or her for some scholarships*
 - Unlike the case of AP, in some states, regulations mandate the transferability of dual enrollment credit to other state schools, to improve college affordability; however, transfer of dual enrollment credits to private colleges and institutions in other states is more problematic, and, like credit for AP classes, depends on the policies of the college the student attends
 - The relationship between dual enrollment in college campus classes and eligibility to participate in interscholastic sports, which sometimes has a requirement that a student physically take a minimum number of Carnegie Units at his or her high school
 - How college providers of dual enrollment courses should price their services
 - *E.g., Should Community Colleges charge less than State Universities, despite the confusion and access issues this causes?*
 - How to share the cost of dual enrollment courses, between high schools and colleges
 - *Which can be further complicated by the class location and faculty quality issues*

Online Classes

- The most disruptive trend in accelerated learning today is the explosion of online classes. NCES data from 2010 showed that over the previous five years, online education offerings had radically changed:
 - While the percentage of high schools purchasing online courses from university vendors had increased from 47 to 50%, those purchasing from independent vendors surged from 14 to 47%. Over the same period, those purchasing online courses from their own district fell from 21 to 18% of all high schools.
 - Similarly, high schools purchasing two way interactive video courses fell from 41 to 17%, while those purchasing internet based courses increased from 40 to 63%, and the percentage of high schools allowing those courses to be accessed from a student’s home increased from 41 to 70%
- In 2012, online education exploded, led by new offerings from companies like edX, Coursera, Udacity, and iTunesU taught by world class professors
 - MIT alone claims that it is adding over one million new users per month via the courses it offers on edX
- Most of these massive open online courses are not yet direct competitors for Dual Enrollment classes (or indeed for public schools) because today they don’t offer high school or college credit. However, this is changing, which will create a major discontinuity in both secondary and post-secondary education:
 - E.g., in September 2012, Colorado State University’s Global Campus announced it would offer transfer credit for students who successfully complete an Udacity course
 - October 2012, Antioch University announced that it will offer high school students Antioch credit for MOOCs provided via Coursera. Georgia State and the University of Texas are among the other schools that have announced similar initiatives, some in partnership with Pearson Learning, which would use its global network of testing centers to offer proctored exams for MOOC-based for credit courses

Online Classes (cont'd)

- At the World Economic Forum in January 2013, the rapid advance of online education was a major topic of discussion. Highlights included the following observations:
 - MOOCs are speeding the transition from an educational system based on “seat time” to one based on progress along a “novice to expert competence spectrum.” This approach is already in use in the military and many corporate training programs, and will be further accelerated by the development of new credentials (e.g., like the CPA) that certify a person has reached a specified level of competence in a given area (e.g., see “Portable Stackable Credentials: A New Education Model” by Austin, Mellow, Rosin and Seltzer, published by the McGraw Hill Research Foundation). This will very soon be a path for students who are not planning to attend college, as well as those who are
 - Bill Gates asked, “who is going to jump first into granting a degree that doesn’t have the seat time requirement we do today?”
 - Rafael Reif, President of MIT noted that “a teacher in the future will be more like a mentor. The model of on campus education will be more about mentorship and guidance, with research as an important factor.” [Technology is apparently bringing us full circle, back to a new version of the classic tutorial method]
 - The Financial Times’ Gillian Tett noted that, “the internet is placing universities on the brink of dramatic disruption...that has the potential to devastate their economic models...which is a terrifying prospect for many university employees”
 - *In the Chronicle of Higher Education (“Teaching the World from Central New Jersey”, September 3, 2012), Michael Duneier, a Princeton professor commented about the first MOOC he taught, “within three weeks, I had received more feedback on my sociological ideas that I had in a career of teaching”*
- Larry Summers, former President of Harvard, noted that “It’s important to remember this really wise quote when thinking about the transition to online education: things take longer to happen than you think they will, then they happen faster than you thought they could”

Online Classes (cont'd)

- The introduction of the Common Core Standards should further accelerate the range of online education offerings aimed at the K-12 market, as well as the transition from an educational system based on “seat time” to one based on “competence”, and certified progress along “novice to expert” pathways in different subject areas
 - In September, a group of 23 top private schools announced their intention to offer full credit online classes to their students via a new venture called Global Online Academy
 - *Once they have accumulated sufficient experience, the next step will be to offer these classes to other students*
 - It has already been demonstrated in other areas that online offerings can very successfully implement differentiated/highly individualized instruction
 - *E.g., highly realistic, immersive simulations that range from video slot machines to online games to military and corporate training systems all incorporate substantial cognitive neuroscience research in such areas as real time assessment, adjustment of challenge, and disbursement of positive and negative feedback in order to keep participants interested and to maximize the benefits of their experience*
 - Early experiments with “blended” education approaches that combine online offerings with coaching and support from a teacher have proven to be quite effective
 - *E.g., see Education Week story, “Catholic Schools Turn to 'Blended Learning' to Get More Students”, 24 October 2012*
 - *There is also strong evidence that interaction with teachers is critical to developing non-cognitive skills that make an important contribution to long term success (e.g., see, “Non-Cognitive Ability, Test Scores, and Teacher Quality” by C. Kirabo Jackson of Northwestern University*
 - *A 2012 report from the Brookings Institution found that the combination of improved curriculum and improved teacher quality can increase student math scores by almost 1/3 of a standard deviation (see “Choosing Blindly: Instructional Materials, Teacher Effectiveness, and the Common Core”)*
 - The Common Core has triggered perhaps the biggest increase in venture capital investment in K-12 since the mid-1990s (when instructional CDs – remember “Reader Rabbit” with integrated assessment were first introduced, but foundered on their weak connection to a wide range of different K-12 standards). Quite soon, this investment is going to produce a sharp increase in new online and blended offerings directed at the K-12 market

Online Classes (cont'd)

- The rapid growth of online education options raises critical questions for other acceleration options:
 - Why can't a student take a high school honors course from an online provider (hypothetically, for example, taught by a teacher from a famous New England prep school)?
 - Why can't a student take an online AP course taught by a famous university professor?
 - Why can't a student take a dual/concurrent enrollment high school/college credit course taught by a professor from Stanford?
- Given the rapid progress toward solving the “how can we test students to provide credit” problem, these questions will likely become very urgent very soon
 - They will also raise the same issues about, for example, course weighting for GPA calculations and high school sports eligibility that are raised by “classic” dual/concurrent enrollment options

International Baccalaureate Program

- International Baccalaureate is a highly structured program covering grades 9 and 10 (for “pre-IB”) and 11 and 12 (for the “IB Diploma Program”). IB Diploma candidates must pass a series of final examinations (the global pass rate in 2011 was 78%). If sufficiently high grades are achieved, college credit may be granted by a post-secondary institution
- Researchers have found that the IB program has a beneficial impact on various post-high school outcomes, such as college attendance, grade point average, and probability of graduating within a given period of time. Particularly impressive are studies from Chicago, showing the beneficial impact of IB participation on at risk students
 - See, “The International Baccalaureate experience: University Perseverance, Attainment, and Perspectives on the Process” by Linda Duevel; “The Academic Impact of Enrollment in International Baccalaureate Diploma Programs: A Case Study of Chicago Public Schools” by the RAND Corporation; and “Working to My Potential: The Postsecondary Experiences of CPS Students in the International Baccalaureate Diploma Program” by Vanessa Coca et al. See also “The Influence Of The International Baccalaureate Program On Postsecondary Choices Of Low-income Students” by Kali Young ; and “ Case Studies of Participation and Performance in the IB Diploma Program” by SRI International
 - All these reports emphasize the importance of providing strong academic and emotional/social support for students in the IB program

International Baccalaureate (cont'd)

- Like other acceleration options, concerns have also been raised about IB
 - The same concerns have been raised about IB studies that have arisen in AP and DE studies: have researchers adequately controlled for other factors (e.g., family background, high school quality, non-cognitive/emotional and social strengths) that are also causally related to the measured outcomes?
 - In their study of IB in Chicago Public Schools, Coca and her colleagues found that “only 62% of students who entered [pre-IB] subsequently enrolled in the IB Diploma Program at the end of Grade 10. There were no beneficial post-secondary effects of IB participation on the 38% of students who did not complete the Diploma Program.”
 - *Globally, the 2011 pass rate for IB Diploma Exams was 78%. Based on this, IB seems to have a dropout rate of about 50% (= .62 x .78)*
 - *A further question concerns the incentives faced by those running IB programs. If their primary objective is to maximize the percent of IB Diplomas awarded as a percent of students who are IB Diploma candidates, this would create an incentive to force the weakest potential diploma candidates out of the pre-IB program.*
 - Duevel noted that, “respondents indicated the challenging program and its good university preparation as the two benefits, while the elitist atmosphere and workload stress were the two most frequently mentioned negative aspects. Respondents were more positive toward aspects that affected them as individuals, less positive where there was a need to work with, or rely upon others.”
 - In “Students' Perceptions of the Social/Emotional Implications of Participation in Advanced Placement and International Baccalaureate Programs”, Foust et al found that, “IB students were more likely than AP students to complain about the rigidity of their program because of the reported limitations it placed on class choice, extracurricular activities, and interactions with nonparticipants; cite differences between themselves and non-participants; perceive a negative stereotype associated with the program; and report experiencing greater exhaustion they attributed to the workload.”
 - *Similarly, in “Mean Levels and Correlates of Perfectionism in International Baccalaureate and General Education Students”, Shaunessy, Suldo, and Friedrich found “a significant decrease in mean levels of adaptive [healthy] perfectionism and an increases in maladaptive perfectionism by grade level among IB students” as grade level increased. They found just the opposite among general education students. The authors noted that “IB students evidenced a particularly strong inverse relationship between maladaptive perfectionism and global life satisfaction.”*

Early College High Schools

- Early College High Schools are small (and often charter) schools designed so that students can earn both a high school diploma and an Associate's degree or up to two years of credit toward a Bachelor's degree. They are based on the principle that academic rigor, strong emotional and social support, and the opportunity to save time and money, is a powerful motivator for students to work hard and meet serious intellectual challenges
 - Less frequently, ECHS takes the form of a combined dual enrollment/fifth year of high school program that results in an Associate of Arts or Sciences degree, similar to Colorado's ASCENT program
- About half of Early College High Schools are located on or near college campuses
- Early College High Schools have been cited by some researchers as an effective way to improve post-secondary results for at risk students
 - “The idea behind accelerated learning is that challenge is a greater motivator than remediation”
 - Early College High Schools “take seriously what many dropouts and disengaged students say: we are bored and we will work hard if you expect a lot of us”
 - E.g., see “Making the Grade: Texas Early College High Schools”, a report by Jobs for the Future
 - *66 percent of ECHS students in Texas are Hispanic, compared with a statewide average of 49 percent; 63 percent of ECHS students are economically disadvantaged, and 74 percent are first-generation college goers*
 - See www.earlycolleges.org for additional background research
- The main criticism of the ECHS model is that it deprives students of some important aspects of the high school experience, like clubs and sports
 - However, it makes up for this with an explicit program of emotional and support for students, delivered in close cooperation with the affiliated college

Accelerated Learning Options: Comparisons

- Quantitative comparisons of accelerated learning options are limited by the quality of state educational data systems. Because it is exceptionally comprehensive (covering K through state universities), Florida’s data has been used for the relatively few studies that compare dual enrollment, AP, and IB outcomes
- In “High School Students Who Take Acceleration Mechanisms Perform Better in SUS [the state university system] Than Those Who Take None” (an analysis by Florida’s Community College System), the following table was presented to compare outcomes:

Variable	Non-Accelerated Students	Dual Enrollment Only	AP Only	DE & AP	IB Only
Mean High School GPA	3.2	3.4	3.4	3.6	3.4
Mean State University System GPA	2.6	2.8	3.1	3.2	3.1
Mean SAT Verbal Score	526	545	597	614	609
Mean SAT Math Score	517	534	591	602	599

- Similar results were reported by Cecilia Speroni in “Determinants of Students’ Success: The Role of Advanced Placement and Dual Enrollment Programs”, who found that “students who combine both DE and AP courses fare better than those who only participate in one program, suggesting important complementarities between them.”

Accelerated Learning Options: Apparent Trade-Offs Suggested by the Research Evidence

- Reducing Cost of College/Transferability of Credits
 - Dual Enrollment and Early College usually have guaranteed college credit transfer, provided you pass the course and attend an in-state public post-secondary institution (e.g., community college, state college or university)
 - However, if planning to attend a private in-state, or a private or public college out of state, dual enrollment credit may not be as easily transferable as AP or IB courses, provided you achieve a high test grade. The nature of the specific dual enrollment class will also likely have a significant impact on credit transferability (e.g., community college course delivered onsite at high school vs. online course from Harvard vs. course taken on the campus of a state university). On balance, the more obviously rigorous the DE course, and the higher the student's grade, the more likely the transferability of the credits received
- At Risk Students
 - Early College High Schools and IB programs (provided they have a high level of academic and emotional/social support) have delivered impressive results in some cases
- In-Depth Discussion
 - Honors and Dual Enrollment/Early College may offer more flexibility for in-depth discussion of issues within a given class. Whether this will be the case with redesigned AP courses remains to be seen. Via its relatively strong emphasis on writing, IB also encourages more in-depth analysis

Accelerated Learning Options: Apparent Trade-Offs Suggested by the Research Evidence (cont'd)

- **Extent of Program Structure vs. Flexibility**
 - Honors, AP, and Dual Enrollment (including Online) are individual classes, while IB is a highly structured program of study. Early College programs may fit into either category, depending on the school
- **Level of Maladaptive Student Stress**
 - IB programs appear to generate a higher level of student stress than AP classes
- **Grade-Point and Class Rank Calculations**
 - Dual Enrollment and Online courses may receive lower weights in these calculations than Honors, AP, and IB courses
- **Athletic Eligibility and Extent of Extracurricular Activities**
 - To the extent they are not taken at a high school, Dual Enrollment and Online courses may affect a student's eligibility to participate in interscholastic athletics. Early College High Schools may not offer athletic programs and as wide a range of other extracurricular activities as other high schools
 - Some studies indicate that IB, more so than Honors, AP, and Dual Enrollment, limits the time available for extracurricular activities

Accelerated Learning Barriers in Colorado/ Priorities for Legislative Action

- **Honors Classes**
 - None, apart from districts' willingness and ability to offer them (part of broader school funding issue)
- **Advanced Placement Classes**
 - Resources to pay for AP tests for some students
 - Resources to pay for advanced training for AP teachers (part of broader school funding issue)
- **Dual/Concurrent Enrollment Classes**
 - Some districts will not allow a student to take a dual enrollment class if (a) he/she has not taken all the AP classes offered at his/her high school, regardless of his/her interest in different subject areas, or (b) a similar online course is offered by the district. Put differently, financial considerations appear to be dominating best education practice
 - The current regulations for pricing of these classes by community colleges and the University of Colorado (CU Succeed) is not uniform, and is currently the source of much confusion among parents, as well as conflicts between them and district administrators. There is a very strong efficiency argument for uniform pricing by all public post-secondary providers of Dual/Concurrent Enrollment Offerings
 - *Current regulations only require a school district to pay the community college price, which is set by regulation. In contrast, the pricing of Concurrent Enrollment Classes provided by the University of Colorado/Denver (CU SUCCEED) is subject to negotiation between CU and individual districts. This potentially limits access to some Concurrent Enrollment Classes to students from families who can afford to pay the difference. Anecdotally (no survey has been done), these negotiations appear to be a point of considerable friction between districts and providers, and a source of great confusion and frustration to parents*
 - *In other states, policymakers have recognized that, just as there is a public policy logic for charging in-state students lower tuition to attend public in-state colleges, there is also a public policy logic for requiring all public post-secondary institutions to charge the same discounted price for Dual/Concurrent Enrollment Classes offered to high school students*
 - Requirements for faculty who teach community college and CU Succeed classes appear to differ; moreover, there are sometimes conflicts with K-12 licensure regulations when college faculty desire to teach Dual/Concurrent Enrollment Classes at high schools
 - There appear to be opportunities to expand enrollment in on-campus Dual/Concurrent Enrollment Classes through expansion and/or better coordination of student transportation issues, both within and across districts
 - Colorado would benefit from uniform policies regarding the weighting of Dual/Concurrent Enrollment Classes, as well as their interaction with CHSAA athletic eligibility rules

Accelerated Learning Barriers in Colorado/ Priorities for Legislative Action (cont'd)

- **Online Classes**
 - The rate of change in online offerings is outpacing regulations
 - There is a need to clarify the process for approving online classes that can be offered, to set the amount that school districts will pay for them, and to clearly specify the circumstances under which a student may take them (see the first point under Dual/Concurrent Enrollment Classes, above)
- **International Baccalaureate Programs**
 - Where these programs are specifically targeted to at risk students, there is a need to clarify the minimum academic and emotional/social supports that will be provided, and how the cost for these will be split between districts and the state
- **Early College High Schools/ASCENT**
 - Issues surrounding the timing of notification of ASCENT eligibility are being adequately addressed by the Colorado Concurrent Enrollment Advisory Board
 - Expansion of Early College High Schools, including ECHS for gifted and talented students, appears to depend on districts' willingness to support additional charter schools. Because such schools are likely to draw students from multiple districts, it may be more efficient to use a state sanctioning process for them
- **Research, Reflective Practice, and Improved Communication of Lessons Learned**
 - As has been done in Florida and Texas, many groups (e.g., students, parents, educators, legislators, employers, and voters) would greatly benefit from more systematic research at the state level into the effectiveness and efficiency of the six accelerated learning options discussed in this review

Conclusions

- Accelerated learning options are of rapidly growing importance to all Colorado students and their parents
 - They are of particular importance to two groups whose educational success or failure will have a disproportionate impact on Colorado's economic growth and future fiscal health: at risk students and gifted students
- Accelerated learning options all have strengths and weaknesses; however, the available evidence indicates they are all effective, though to varying extents for different groups of students
 - Parents and students must carefully consider the trade-offs between them
- Legislative action and regulatory changes are most needed to expand access and improve quality in three areas:
 - Dual/Concurrent Enrollment
 - Online Classes
 - Early College High Schools
- There is also a need for systematic, state level research and continuous policy adaptation to ensure that Colorado stays are the forefront of Accelerated Learning for high school students, and provides taxpayers with the highest value for their education investment
 - In the face of so much change, we cannot hope to accurately predict the future. Instead, we must ensure that Colorado can adapt to change faster than other states

Recommendations

- Introduce new legislation, and/or amend current state regulations as follows:
 - Specify the circumstances under which a high school student may take a Concurrent Enrollment Class
 - Set a uniform state-wide price for Concurrent Enrollment Classes provided by any and all public post-secondary institutions, and specify the portion of this price that must be paid by the district
 - Set uniform requirements for the qualifications of post-secondary institution faculty who deliver Concurrent Enrollment Classes, and resolve current issues surrounding K-12 licensure for Concurrent Enrollment Classes delivered by college faculty on a high school site
 - Establish uniform state regulations regarding the weighting of credit from Concurrent Enrollment Classes in the calculation of high school Grade Point Averages, and eligibility to participate in interscholastic athletics
 - Require CDE to deliver a report on opportunities for reducing transportation barriers to greater use of Concurrent Enrollment
 - Specify a uniform state process for approving online classes that can be taken by high school students, set the maximum amount that school districts will pay for them (logically, no more than the price for Concurrent Enrollment Classes in Colorado), clearly specify the circumstances under which a student may take them, and state how they will affect the calculation of grade point averages and athletic eligibility
 - Establish a state-level approval process for new Early College High Schools
 - Establish requirements for the CDE, with the agreement of the Concurrent Education Advisory Board (CEAB), to conduct a program of research into the effectiveness and efficiency of various Accelerated Learning Options, and annually report the results and associated recommendations for policy and regulatory improvements, to the Governor, General Assembly, State Board of Education, CEAB, District Superintendents, and local school boards

Appendix

Jefferson County Association for Gifted Children

The Jefferson County Association for Gifted Children (JAGC) is a non-profit group providing leadership and support to families and educators of approximately 9,000 gifted young people in Jefferson County, Colorado

- Foster public awareness of the needs of gifted children
- Present GT resources and educational opportunities to families, educators and the community
- Encourage advocacy and best practices for gifted and talented students at the local and state level
- Reach and connect the gifted and talented community with opportunities to share experiences and exchange information
- Maintain positive working relationship with Jefferson County School District

www.jeffcogifted.org

Susan Miller, President