



The Rigor Gap: Comparing Course Grades and End-of-Course Exam Results of Algebra I and 10th Grade English Students in Florida

Questions and Answers

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What is the Rigor Gap?

The Rigor Gap is the difference between a school's evaluation of a student's level of mastery of state standards and the student's demonstrated mastery of those standards on the corresponding statewide standardized end-of-course exams (Grade 10 English Language Arts and Algebra I). For example, a student earning a B in a course would likely expect to pass the EOC. However, our research shows that many students who likely perceive that they have mastered course content based on their grades, have not, as evidenced by their EOC scores.

Highlights of the Rigor Gap Study

Florida has robust standardized end-of-course (EOC) exams to ensure students are learning Florida's strong educational standards. Those EOCs are scored on a Level 1–5 scale with 1 being the lowest and 5 being the highest. Level 3 is the minimum passing score.

If students are being held accountable for the standards that they will be assessed on via the EOCs, there should be considerable alignment between course grades and EOC scores. However, that is not what we found.

In terms of Grade 10 English-Language Arts (ELA) Results:

Of the students not passing the Grade 10 ELA EOC (Levels 1 & 2 combined), 37% earned B or higher in the class, and 72% earned C or higher in the class. Breaking this down further: Of the students scoring the lowest (Level 1) on the exam, 25% earned B or higher in the class, and 61% earned C or higher in class. And, of the students scoring Level 2 on the exam, 46% earned B or higher in the class, and 80% earned C or higher in class.

In terms of Algebra 1 Results:

Of the students not passing the Algebra 1 EOC (Levels 1 & 2 combined), 12% earned B or higher in the class, and 55% earned C or higher in the class. 12% might not sound like a lot, but it represents enough students to fill approximately 1,300 classrooms over 3 years. Breaking this down further: Of the students scoring the lowest (Level 1) on the exam, 7% earned B or higher in the class, and 47% earned C or higher in class. And, of the students scoring Level 2 on the exam, 20% earned B or higher in the class, and 74% earned C or higher in class.

While this research was conducted with student data prior to the COVID–19 pandemic, we hypothesize that the drastic impact it had on students' learning experiences during the 2019–20 spring semester has likely exacerbated the Rigor Gap presented in the cohorts which comprise our research through, among other things, more lenient grading practices and issues related to delivering high quality distance learning. With the U.S. Department of Education having waived requirements for EOCs such as these during the recently completed 2019–20 school year as a result of the pandemic, our findings provide information relevant to the policy discussion on whether or not statewide, standardized assessment requirements should resume in 2020–21. Based on our report findings, we believe it is extremely necessary to bring back the statewide standardized testing.

Why did we do this study?

Last year, the Florida Council of 100 published a report entitled, “The Horizons 2040 Project: Grades PreK-12.” In the report, we developed a 20-year vision for education in the state. During the three-year project, we traveled the state, meeting with both subject-matter and pedagogical experts, teachers, leaders, and students from all walks of life and all types of schools. Based on this rich and varied input, we created a system of values to guide educational program and policy development; policy “beacons,” or goals, for the state to reach; and strategies that could help move Florida toward the beacons.

One of those values was “highest expectations,” which calls for the establishment and maintenance of the strongest educational standards in the nation. With such standards, however, comes an obligation to ensure that all students learn the required academic material – thus, the value of “accountability.” This led to the first recommendation in Horizons – Build upon the proven formula of high standards, rigorous assessments, and strong accountability for all Florida students. We know we now have the best (B.E.S.T) standards in the nation, but the data collection for our report indicated that students might not be fully learning those standards. So, we decided to look more deeply at the issue.

Simply put, it is vital to Florida students, colleges, and employers that students graduate high school having mastered the standards that educators and experts have stated are key to students’ success in college and the workplace. Right now, the degree of such mastery is in question. Businesses are having difficulties finding employees who do not need substantial training on skills that should have been learned in the educational system. Similarly, colleges are also having to remediate students on such skills.

While we firmly believe that Florida’s record-setting graduation rate is a tremendous accomplishment, we also see chinks in the armor. Both the Grade 10 English Language Arts and Algebra 1 end-of-course exams are must-pass for graduation. However, during the years of our study, only half of Grade 10 students passed the English Language Arts end-of-course exam on their first try, and that percentage dropped to 40% of high schoolers passing the Algebra 1 end-of-course exam.

So, we wondered – were the end-of-course exams too hard? We found the answer to be “no” because we see the same results on national tests. 1/2 to 2/3 of Florida students do not score college-ready on the SAT/ACT (worse than national average), and 1/4 to 2/5 of Florida students scored below basic on 12th grade National Assessment of Education Progress (NAEP – the gold standard of interstate educational comparisons). We also found a national survey indicating that half of 12th graders do not feel their school prepared them for college.

So, then we considered – If students are not passing the end-of-course exams, are they being retaught the material before being promoted to the next grade? So, we looked at student retention rates and found that student retention has dropped dramatically over the past 15 years (e.g., Grade 9: 15.5% to 3.1%). If this were because student learning had significantly increased, then we should have also seen an equivalent increase in student performance on 8th or

12th grade NAEP scores over that time period. That, though, was not the case, especially given the stagnation indicated by the 2019 NAEP scores.

It was at that point that we hypothesized that students and parents might be getting a false sense of security that, if the students were receiving relatively high grades in English and Algebra 1 throughout the school year, they would likely demonstrate that mastery on the end-of-course exams. In other words, if there were a disconnect between the level of learning required to earn a high course grade and the level of learning required to demonstrate mastery of state standards on the must-pass end-of-course exams, inefficient signaling of student skill level might be occurring, preventing students from getting extra help learning the standards when there is still time to act before the end of the school year. We coined this phenomenon the “Rigor Gap,” and conducted our study to see if student course grades were aligned or misaligned with expected performance on the must-pass end-of-course exams.

Study Methodology

Summary: Using Florida Department of Education data, we compared students' grade transcripts and end-of-course exam scores on the two "must pass" exams for graduation, Algebra I and English Language Arts (ELA) Grade 10. There was no personally identifying information provided for these students. We used records for over 200,000 students in each course who did not pass the EOCs on their first attempt and had 1 teacher throughout the course. We analyzed 3 years of data (2016-2018).

In getting this data ready to do our analysis, we first limited our observations to each student's first attempt at both the course and the EOC. With this, none of the students in our sample have learned the material multiple times before taking the EOC by, for example, taking a portion of the course one year and then completing the entire course with its EOC in a later year.

After this, we limited our observations to students who took the same course, at the same school, without pause. The goal of this was to best ensure that we are seeing the assessment practices of only one teacher for each student. If a student switched from a regular class to an honors class, it is likely they had a different teacher when they made the switch, so they were not included in our sample. Obviously, if a student transfers schools they will have a different teacher, so they were not included in our sample. A student who "pauses" their completion of a course, for example, completes the first half of the course during the traditional August–December first semester and, instead of completing the second half of the course during the traditional second semester, completes it over the summer. A student who does something like this likely had a different teacher for each of the time periods over which they first attempted the entire course, so they were not included in our sample.

One of the most tasking parts of this project was obtaining the student's annual course grade to conduct our analysis. While the annual course grade was included in the data for some students, it was often left broken down into the grade earned in each term for which the course was attempted. So, to generate the annual grade, we had to first convert the grade from the A–F letter grade provided in the data to its typical 0–4 numerical equivalent, with an "A" being a 4 and an "F" being a 0. From here, we took the grade earned in each term of the student's first attempt of the course and averaged them together to generate the annual grade. For example, many students in the data had their annual course grade broken down into "Semester 1" and "Semester 2" terms. If a student such as this were to earn a "B", or a 3 for our purposes, in Semester 1 and a "C", or a 2, in Semester 2, their annual grade would be a 2.5.

Also, it is important to note that our findings are robust to using only students with an annual grade provided. We checked our findings by conducting the same analyses with only students who had an annual grade provided and the story remained the same.

What is the impact of the Rigor Gap?

It is not hard for any of us to think back to a class we had at some point in our lives where we did not learn as much as we could have, or should have, because we knew the teacher's grading practices made the course an "easy A." In fact, a 2010 study showed that students study 50% less when they expect teachers to award relatively higher grades. This reduction in what is learned in a given course can have serious personal and economic consequences. Just like we did, today's students will likely study less than they would have if their teacher held them to a higher standard, and by the time the student has received their EOC score which raises the question of which measurement of knowledge should be given more credence, it is time to enjoy summer recess or focus on the next class in the subject's succession. The time spent not learning content requisite for success in the next class is hard to get back and could eventually lead to the student not possessing the knowledge to succeed in college or successfully pursue their desired occupation, and it could hinder the state's ability to bolster its workforce talent pipeline.

Also, the Rigor Gap creates the cognitive dissonance that many students and their parents face when trying to ascertain whether the student's high course grade or non-passing EOC score is a more accurate indicator of their content knowledge. Florida possesses a robust set of statewide, standardized end-of-course (EOC) exams that are directly tied to content teachers are expected to teach in the classroom, but our research found that 72% and 55% of students who did not pass the ELA Grade 10 FSA and Algebra I EOC, respectively, received a course grade of C or higher. That said, although a student's EOC score is the most objective and comparable measure of performance across districts, schools, and classrooms, 84% of K-12 parents nationally still believe report card grades reflect grade-level achievement. That is not what the Rigor Gap study found.

How would closing the Rigor Gap support the implementation of the new B.E.S.T. state educational standards?

The new state standards will only be effective to the extent that they are thoroughly learned by students. Closing the Rigor Gap will help achieve this goal by ensuring that students are incentivized to master the standards throughout the year, a result that will be demonstrated by improved performance on the state's must-pass English and Algebra 1 end-of-course exams that will be aligned to the new standards.

How do we justify supporting raising teacher salaries when this paper appears to say teachers have not been doing their job?

This is really two separate questions. We will address the second part, first.

Our research is not saying that teachers are not doing their jobs.

- The report only points out the existence of a Rigor Gap. Our research cannot identify the specific mechanism(s) by which the Rigor Gap operates.
- However, we hypothesize that the Rigor Gap is likely a systemic phenomenon in which multiple stakeholders play a part, including districts, schools, leaders, educators, parents, and students. For example, a recent study out of North Carolina found anecdotally that another mechanism potentially enabling the Rigor Gap is teachers “often report[ing] pressure from others to confer high grades or to pass students.”
- The Rigor Gap is also likely an awareness issue. Data linking course grades to test scores is not summarized and made readily available to stakeholders. Furthermore, the existence of a Rigor Gap and the importance of closing the gap do not appear to be topics directly and extensively addressed as part of teacher training and development.
- In today’s society, there is an inclination to reward effort rather than mastery (the “everyone gets a gold star” effect). For example, a student’s grade might be heavily based on their performance on collaborative exercises, homework graded solely on completion, and activities that reflect effort rather than mastery, which might not necessarily demonstrate a specific student’s knowledge of the content. If there are enough assignments such as this of a significant weight throughout the year, it might obfuscate the student’s overall performance on tests and quizzes – assignments that generally require the student to independently and explicitly demonstrate content knowledge – and, ultimately, lead to a course grade that does not accurately reflect the student’s knowledge of the content. In fact, a 2018 national survey showed 48% of elementary and middle school teachers say report card grades reflect effort more than achievement. In the workplace, it is results that matter – period.
- And lastly, our Horizons 2040 report indicated that only about half of Florida teachers feel supported or encouraged in their work or believe that they have adequate control of planning and teaching in their classrooms. If teachers in fact play a part in the Rigor Gap, they must be fully enabled to do their job.

Secondly, in its Horizons 2040 report, the Council of 100 has long advocated for the need for teacher raises. After effective parenting, the number one determinant of a student’s success is having an outstanding teacher. It is therefore paramount for the state to recruit and retain the best teachers.

We address the recruitment issue first. In 2016, only 3% of Florida’s ACT test-takers said that they want to be educators – that is the lowest percentage in the country. Why? For starters, average teacher pay in Florida is ranked 46th in the nation, or about 20% below the national average. This means it is more financially rewarding to be a postal clerk or flight attendant in our

state, and that is one reason why we have teacher shortages in the state. And we all know the stories about the number of teachers who must hold down multiple jobs to make ends meet. In a competitive labor market scenario, that is a recipe for disaster if we want our best and brightest to choose teaching over more lucrative careers. In short, the state must establish wages competitive with other highly valued professions and comparable to those in the highest performing states. You do not become a top-5 state in workforce development by paying bottom-5 teacher salaries. It just will not happen.

And in terms of retention – Teachers are remembered as much for the impact they have on the personal lives of students as the content they teach. That said, it is hard for teachers to assist in the belonging process if they themselves feel unappreciated. Let's face it – perception is reality, and WalletHub ranked Florida as the 5th worst state to be a teacher. In addition to keeping our financially strapped teachers in Florida classrooms, in the business world, salaries are a key sign of professional respect. Raising those salaries sends a signal that we value our teachers and are willing to put our money where our mouth is.

Is the problem that the end-of-course exams are too hard?

No. No national assessment (SAT, ACT, NAEP) appears to tell a different story than the EOCs. 1/2 to 2/3 of Florida students don't score college ready on SAT/ACT (worse than national average), and 1/4 to 2/5 of Florida students scored below basic on 12th grade National Assessment of Education Progress (NAEP – the gold standard of interstate educational comparisons).

Furthermore, if EOCs were eliminated, promotion would be solely determined by student grades. However, student retention has dropped dramatically over past 15 years (e.g., Grade 9: 15.5% to 3.1%) despite no equivalent increase in student performance on 8th or 12th grade NAEP scores.

If so many students are failing the end-of-course exams, how is the graduation rate so high?

Although there are alternative “concordant” SAT/ACT/PERT scores for bypassing the end-of-course exam requirements, earning those scores does not necessarily indicate readiness for college or the workplace. A concordant score is a minimal threshold score on a statutorily–approved test which enables students who do not pass the English/Language Arts Grade 10 Florida Standards Assessment or Algebra I EOC to earn a standard diploma. For example, a student who does not pass the ELA Grade 10 FSA, but meets all other requirements, can earn a standard diploma by scoring a 430 or higher on the SAT Evidence–Based Reading and Writing (EBRW) section. The concern is that this 430 is likely interpreted by the student as a signal that they are college ready when, in fact, the college ready score for this test is a 480 – 50 points higher. We are not trying to say that the concordant scores should all necessarily match up to each assessment’s college ready score, but we do believe it should be made more clear to students and their parents that many of the concordant scores that exist today allow a student to pursue postsecondary education or a career without having been assessed as ready for what awaits them at the next level.

That said, college readiness is vital. It is generally recognized that a postsecondary credential of some kind is becoming increasingly necessary for economic self-sufficiency. Moreover, a recent national survey found that 84% of high school students reported that they expected to pursue two-year or four-year higher education at some point. This is consistent with another recent national survey showing 79% of parents believe their child will earn a 2- or 4-year degree. And that does not even count the number of students who will be seeking postsecondary certificates and certifications.

Will closing the Rigor Gap hurt graduation rates?

In a word, no. First, while a student earning a high school diploma is important, if the graduate did not learn the skills necessary for success in college and the workplace, we have done them, the taxpayer, Florida's economy, and society-as-a-whole a great disservice. We have wasted four years of the student's life and unfairly and unproductively placed an education burden on employers and the higher education system. From an economic standpoint, we are now having to pay double for human capital formation.

That said, a 2020 North Carolina study of students' Algebra 1 class grades vs. end-of-course exam scores found teachers with higher grading standards improve current and future student learning, including the learning outcomes of all examined student subgroups based on race/ethnicity, gender, and previous academic performance. In short, when we expect more from our students, they rise to the occasion.

Will closing the Rigor Gap hurt minorities?

Just the opposite -- A 2020 North Carolina study of students' Algebra 1 class grades vs. end-of-course exam scores found teachers with higher grading standards improve current and future student learning, including the learning outcomes of all examined student subgroups based on race/ethnicity, gender, and previous academic performance. In short, when we expect more from our students, they rise to the occasion.

Moreover, the North Carolina research showed that grading standards tend to be higher at more affluent schools. According to the researcher: "This is troubling, as it provides more evidence of the 'soft bigotry of low expectations' for relatively disadvantaged students and is yet another example of how such schools compound the disadvantages of their students."

Will closing the Rigor Gap hurt students' chances of getting into college?

Just the opposite. Currently, the Rigor Gap is misinforming students about their readiness for college.

- Nationwide survey: Half of 12th graders do not feel their school prepared them for college
- 1/2 to 2/3 of FL students do not score college ready on SAT/ACT (worse than national average)
- 1/4 to 2/5 of FL students scored below basic on 12th grade National Assessment of Education Progress (NAEP – the gold standard of interstate educational comparisons)

In fact, a 2020 North Carolina study of students' Algebra 1 class grades vs. end-of-course exam scores found teachers with higher grading standards improve current and future student learning, including the learning outcomes of all examined student subgroups based on race/ethnicity, gender, and previous academic performance. In short, when we expect more from our students, they rise to the occasion, and that will help them do better on college entrance exams and write better college application essays. Furthermore, the word will get out quickly to colleges that Florida is eliminating the Rigor Gap and, thus, that Florida GPAs actually mean more than in other states.

Additionally, what is the point of getting into college if you cannot handle the work and drop out? 2/3 of students at 2-year colleges, and 1/3 of students at 4-year colleges, drop out before graduation – and that is allowing 6 years to complete a degree. Remediation rates at colleges are also high, meaning that students must waste time learning what they should have learned in high school instead of furthering their educations and preparing for the workplace. And even more importantly for the student – If they get into college and drop-out, they could be paying a debt load without the degree to assist them in earning a higher salary.

Doesn't research show that students' grade point averages, rather than their test scores, are the best predictor of college success?

First, there is research on both sides of the issue. College entrance exams (and, to a limited degree, scores on national acceleration assessments such as Advanced Placement and International Baccalaureate exams) are still the most objective measures of ability. This is why nearly all undergraduate and graduate programs use such scores for admission purposes and why many states require students to take college entrance exams in high school and build those results into school accountability formulas. (Such legislation passed the Florida House of Representatives in 2020.) Furthermore, if high school GPAs continue to rise for a given SAT score, as they have nationally over the last 20 years according to research, GPA will become less and less of an accurate predictor of postsecondary success – thus, rendering standardized test scores, for better or for worse, a component of growing importance in assessing a student's preparation for postsecondary work.

Second, one must consider what it means to be successful in college. While our study looks at the Rigor Gap at the K-12 level, there is already a whole body of research showing the prevalence of rampant grade inflation at the postsecondary level. One seminal piece in this area is the book, *Academically Adrift*. Thus, the link between high school GPAs and college “success” is merely the perpetuation of the same issue, leaving employers holding the bag when it comes to the need to remediate employees on the skills that they should have learned in the educational system. Simply put, if students master the high school standards, they will be able to better capitalize on their postsecondary educational opportunity, regardless of the grades assigned in college.

Third, grades serve the purpose of being skill differentiators. They signal to colleges and employers which students are more prepared for the rigors of postsecondary education and the workforce, respectively. For colleges, having accurate grade information enables them to more efficiently predict which applicants are prepared for postsecondary education and, if a student is admitted to an institution, the academic strengths and weaknesses of the student so they can be accurately advised which introductory classes to take to ensure that they are ultimately prepared for higher-level work. This is why, in the absence of comparable GPA, colleges often turn to relative class rank as a skill differentiator. For employers, accurate skill signaling enables the hiring of the best candidates both in terms of ability and fit. Employer-employee mismatching is economically inefficient, wasting the resources of both parties, which could have been devoted to productive capital formation.

How do you explain the difference in the Rigor Gap between English 2 and Algebra 1 students?

We hypothesize that there is less wiggle room for subjective judgment in grading math than there is in English. In other words, in math there is typically a right answer and a wrong answer to a problem, which is not open to interpretation.

What effect does the Algebra 1 end-of-course exam constituting 30% of a student's final grade on the study's results?

It strengthens the study's findings that there is a misalignment between course grades and end-of-course exam scores. When the EOC score is added to a course grade, it biases the relationship toward more alignment by bringing the course grade closer to the non-passing end-of-course exam score. Without such a bias, the misalignment would be even more prominent.

Is there any other research supporting your study's findings?

To our knowledge, there have been only two similar studies. First, a 2004 study of elementary students in Alachua County showed 61% of B–students and 17% of A–students not proficient on FCAT. Second, a 2018 report out of North Carolina demonstrated a disconnect between students' Algebra 1 course grades and their end-of-course exams, with 36% of B students not scoring as proficient on the exam.

How does the pandemic affect the Rigor Gap?

To our knowledge, there is no data currently available to explicitly quantify the effect of the COVID–19 pandemic on the Rigor Gap our research observes in prior school years. That said, we hypothesize the Rigor Gap has increased as a result of, among other factors, relaxed grading policies and issues related to delivering high quality distance learning.

- Relaxed grading standards
 - Education Week found that during the 2019–20 spring semester affected by the pandemic,
 - At least 16 states suggested or mandated a “do no harm” method of grading so as to avoid damaging a student’s academic standing
 - 9 states adopted a pass/fail system
 - A 2020 study found that
 - Only 67% of schools were in districts whose websites mentioned that student assignments were being graded
 - At least 28% of schools were under district policies that grades “can only go up” from the time school buildings closed.
 - 12% of schools were in districts whose websites made clear that work would not be graded (as of May 29th).
 - Multiple Florida school districts adopted these policies that grades could only increase, or that work would not be graded, during the distance learning period (e.g., Leon County and Clay County).
 - Another 2020 study found that just 42% of school districts expect teachers to collect student work, grade it, and include it in final course grades for at least some students. This lack of incentive to work to raise a “C” to a “B” – or to receive any grade at all – likely decreased many students’ mastery of standards typically covered in the latter half of the school year.
- Quality of the impromptu distance learning experienced by students during the pandemic
 - A 2020 study found that only 20% of schools were in districts offering “rigorous” remote instruction defined by, among other characteristics: relying primarily on online platforms; expecting all students to participate by either explicit statements or formally taking attendance; and requiring that teachers grade students’ work based on either completion or performance.
 - Another 2020 study found that
 - Only 27% of rural districts in their research expected teachers to provide instruction, compared with just over half of urban school districts.
 - Economic differences were also present, as the most affluent quartile of districts in their sample were twice as likely to expect live video

instruction from teachers than the least affluent quartile. This lack of quality remote learning experienced by many during the pandemic likely increased the Rigor Gap.

What can be done about the Rigor Gap?

Raise stakeholder awareness of the Rigor Gap.

- For teachers, this means creating a more seamless way for them to compare the course grades and EOC scores of students under their instruction, as well as the course grades and EOC score relationships of similar students being taught by other teachers. We think that, once cognizant of the existence of, and educational damage caused by, the Rigor Gap, teachers will adjust their grading practices to better ensure that students are mastering state standards throughout the year and, thus, are more prepared for the end-of-course exams that they must pass to graduate.
- For parents and students, this means better understanding that grades are a tool to measure and adjust learning before it is too late. It does not help John or Jane to discover their deficiencies after the school year is over, when they test poorly on national college entrance exams, or in their final semester of senior year. It also means that parents are less likely to be surprised by their child's end-of-course exam scores. Instead, knowing what is coming, they will be better prepared to work collaboratively with teachers to ensure mastery of standards throughout the year.
- For district and school administrators, this provides more real-time assurance that students are learning what they need to learn to excel in areas driving school and district grades. They will be better able to recognize trends and provide corrective assistance from quarter to quarter or from year to year. They will also be able to better recognize instances in which best practices for teaching the state standards have been developed and, thus, replicate them in other schools or classrooms.

Emphasize the closing of the Rigor Gap in teacher preparation programs and identify the closing of the gap as an additional student need under the School Community Professional Development Act. This will ensure that teachers receive specific training and ongoing professional development regarding the identification of a potential Rigor Gap and methods to address such a gap.

Expedite research into personalized education in which a student must prove that they have learned a skill before moving on to the next one. Whether a student learns the skill on the first attempt or the fifth attempt, a high grade can be awarded because actual learning has occurred.

Research the feasibility of using shorter, adaptive standardized assessments to earlier illustrate student's knowledge of the standards to students, teachers, and parents. Adaptive assessments that more efficiently gauge a student's skill level without a large number of questions are currently being used in many private schools to inform educators of a student's level of content mastery and the specific areas in need of improvement.

Convene a blue-ribbon committee of education stakeholders to assess the breadth, depth, and operating mechanisms of the Rigor Gap and make recommendations regarding how to close the gap. Our report only points out the existence of a Rigor Gap. Our research cannot identify the specific mechanism(s) by which the Rigor Gap operates.