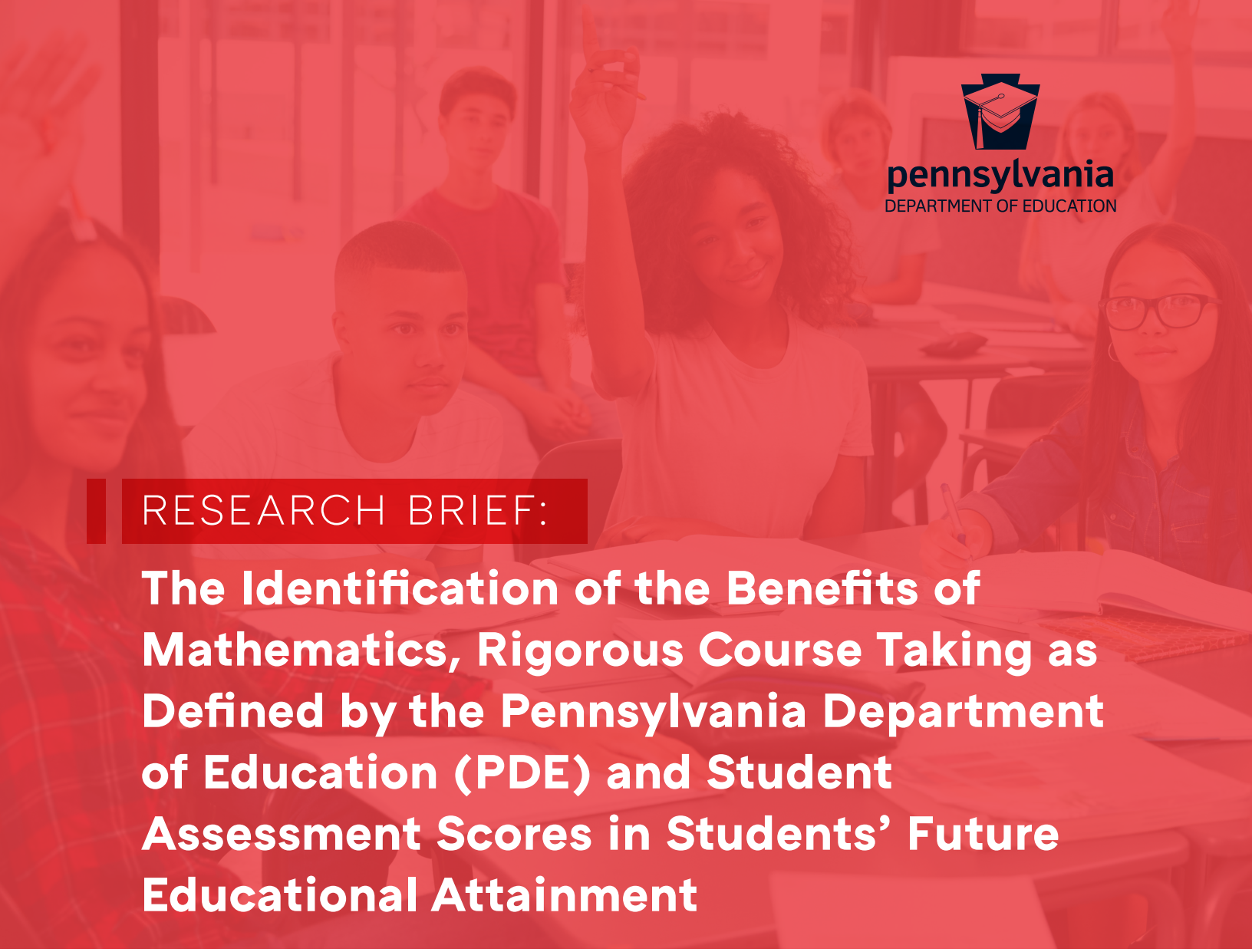

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RESEARCH BRIEF:

The Identification of the Benefits of Mathematics, Rigorous Course Taking as Defined by the Pennsylvania Department of Education (PDE) and Student Assessment Scores in Students' Future Educational Attainment

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Research and Evaluation

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Abstract

The success of students in Pennsylvania (PA) has been deemed a top priority in the Governor's commitment to strengthen the education system, which can lead to improved opportunities for PA students and make the path to a postsecondary education more accessible. The research questions addressed in this report are directly aligned with the Governor's Strategic Plan Priority Goals and answer priority research questions within two of PDE's major Research Agenda areas – P–20 Policy and Postsecondary Education. Three cohorts of Pennsylvania students were followed from Grade 9 entry and two from Grade 7 entry to various points in postsecondary study depending on the cohort. Analysis of data over time for students who graduated from PA high schools showed a large effect and significant association between rigorous and advanced course taking in high school, and postsecondary enrollment and success. These findings indicate that early college credit opportunities for students through AP or IB programs and dual credit enrollment opportunities are making a difference for students graduating from high schools in PA in terms of defining students' postsecondary path and success. Additionally, taking an advanced algebra course during high school, the timing of Algebra I, and Grade 8 PSSA and Keystone performance were all found to be significantly associated with an increase in odds of on-time high school graduation, postsecondary enrollment, persistence and retention, even after controlling for other significant explanatory variables.

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The Pennsylvania Department of Education (PDE) Evaluation and Research project is an effort that was established through a State Longitudinal Data System (SLDS) Grant from the Institute of Education Sciences (IES), National Center for Education Statistics (NCES), awarded in October 2015. The Research and Evaluation project is an initiative to make full use of the P-16+ system data and other data sources to answer priority questions from the PDE research agenda, to form collaborative research partnerships, and to increase PDE's capacity to conduct research. Our mission is to evaluate and analyze data to provide insight that can be used to positively impact policy, inform decision making and lead to improved student outcomes.

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Access the full report on "The Identification of the Benefits of Mathematics, Rigorous Course Taking as Defined by the Pennsylvania Department of Education (PDE) and Student Assessment Scores in Students' Future Educational Attainment" **and additional Research Project reports on PDE's website.**

KEY FINDINGS:

Overall

- Logistic regression analysis showed a statistically significant association between the number of advanced (AP, IB, dual credit, honors, or gifted) courses a student takes, taking an advanced algebra course during high school, the timing of Algebra I, and Grade 8 PSSA and Keystone performance with on-time high school graduation, postsecondary enrollment, persistence and retention, even after controlling for other significant explanatory variables.
- For students in the 9th grade cohorts, the odds of a student graduating from high school on-time were 1.795 to 1.86 times higher if a student has taken an advanced algebra course in high school and 2.25 times higher if a student has scored proficient or advanced on the Keystone Algebra test.
- For students in the 7th grade cohorts, the odds of enrolling in a postsecondary institution after high school graduation were two times higher if a student had taken an advanced algebra course and 1.3 to 1.6 times higher if a student had scored proficient or advanced on the Grade 8 Math PSSA test.

KEY FINDINGS:

Course Taking Patterns

- Advanced Placement (AP) course taking for PA high school students was found to be positively associated with on-time high school graduation and all postsecondary outcomes. For college enrollment, a large effect size showed that 90 percent of students who enrolled in at least one AP course enrolled in college, compared to 58 percent for students who did not enroll in any AP courses.
- PA students who enrolled in at least one rigorous (AP, IB, or dual credit) course in high school had significantly higher rates of favorable postsecondary outcomes than students who did not enroll in any rigorous courses in high school. Effects for all outcomes were moderate, except for college enrollment, with a large effect. Eighty-eight percent of students who enrolled in at least one rigorous course in high school enrolled in a postsecondary institution following high school graduation compared to only 56.4 percent for students who did not.
- Students who participated in at least one advanced course also had significantly more positive educational outcomes than students who did not. Most effects were moderate, except for college enrollment which was large; 84 percent of PA students who enrolled in at least one advanced course in high school went on to enroll at a postsecondary institution compared to only 47 percent of students who did not.
- For students in the 9th grade cohorts, the significant effects of taking an advanced algebra course in high school decreased after entry into the second year of postsecondary. Although advanced algebra was found to increase the odds of on-time high school graduation, postsecondary enrollment, and persistence to year two, it had no significant association with persistence to year three, retention to year two or three, or postsecondary graduation within four years of high school completion.
- Although the effect of taking an advanced algebra course in high school diminished over time for the students in the 9th grade cohorts, the significant effect of the number of advanced courses taken in high school remained for all postsecondary outcomes, including graduation from a postsecondary institution within four years of high school completion.
- The timing of enrollment in Algebra I is significantly associated with and a very important precursor to the probability of a student enrolling in a postsecondary institution following high school graduation. However, defining early versus late timing for enrollment is important as analysis results suggest that early timing, defined as enrollment in Algebra I in "middle school," when

compared to late timing (high school) has the largest effect with a moderate positive association (ϕ = .24, p < .0001).

- For PA students, there were small but significant effects for the timing of first exposure to Algebra I; 78 percent of students who enrolled in Algebra I during Grade 8 enrolled in college compared to 64 percent who did not enroll in Algebra I in Grade 8.
- For the 7th grade cohorts, 80 percent of students who enrolled in Algebra I during middle school enrolled in college, compared to 58 percent who waited until high school to enroll in Algebra I.

KEY FINDINGS:

Standardized Assessments

- Grade 7 PSSA math scores had a significant but small positive association with high school graduation but had moderate effects on postsecondary enrollment. Seventy-six percent of students who tested as Proficient/Advanced on their Grade 7 PSSA math test enrolled in postsecondary study, compared to 42 percent who tested as Basic/Below Basic.
- Grade 8 PSSA math scores were found to be positively associated with postsecondary enrollment and persistence and retention to year two, showing moderate and small effect sizes, respectively. Although the differences in proportions for all outcomes were statistically significant, the difference between groups in postsecondary enrollment is larger. For students with a Proficient/Advanced achievement level, 76 percent enrolled in a postsecondary institution compared to only 42.5 percent of students with a Below Basic/Basic achievement level.
- For all postsecondary outcomes, students who tested as Proficient/Advanced in any subject area of the Keystone Exam had higher rates of postsecondary enrollment, persistence, and retention to year two when compared to students who tested Basic/Below Basic. Across all Keystone subject areas, the largest difference between the Proficient/Advanced and Below Basic groups was in rates of postsecondary enrollment.

KEY FINDINGS:

Demographic Student Groups

- On average, female students had significantly higher rates than males in on-time high school graduation, college enrollment, persistence and retention, and college graduation within four years. However, the effect sizes were small, with the largest difference between females and males in rates of college enrollment (74% and 63%, respectively).
- Non-special education students tended to have significantly more favorable outcomes than special education students. For instance, a moderate effect size showed that 73 percent of non-special education students enrolled in postsecondary education compared to 38 percent of special education students.
- Despite a relatively small English learner (EL) student population, significant small effects were found between EL students and non-EL students in on-time high school graduation, postsecondary enrollment, college persistence and retention, and college graduation within four years of high school completion.
- Significant and moderate effects showed that historically underperforming (special education, EL, or economically disadvantaged) students in PA tended to have less favorable outcomes than non-historically underperforming students, especially for college enrollment. Eighty percent of non-historically underperforming students enrolled in college during the fall after high school graduation, compared to 53.4 percent of historically underperforming students.
- Students in the historically underperforming student groups had a lower probability of on-time high school graduation, postsecondary enrollment, persistence, retention, and graduation within four years from high school completion, when compared to other students.
- There were significant and moderate effects

based on economically disadvantaged status in on-time high school graduation rates and all postsecondary outcomes. The largest difference was found in postsecondary enrollment with only 55 percent of economically disadvantaged students enrolling compared to 77 percent of non-economically disadvantaged students.

- In PA, Black or African American, Hispanic, and Multi-racial students, on average, had less favorable outcomes than White and Asian students for on-time high school graduation, postsecondary enrollment, persistence, and postsecondary graduation within four years. For postsecondary graduation, a moderate effect of race/ethnicity showed that only 28 percent of Black or African American students graduated within four years, compared to 51 and 50 percent of Whites and Asians, respectively.

KEY FINDINGS:

Geographical Region Differences

- Across all outcomes, students who graduated from high schools in rural and suburban areas generally had the most favorable outcomes with small effect sizes, while students who graduated from high schools in urban city regions had lower rates of educational attainment.
- Students who graduated from high schools in suburban regions had significantly higher odds of postsecondary enrollment when compared to students from other regions.
- Students who graduated from high schools in urban (city) regions had significantly lower odds of postsecondary persistence and postsecondary graduation within four years of high school completion.

KEY FINDINGS:

Postsecondary Institution Type or Enrollment Status Differences

- Only a small percentage of students (27%) who began at a 2-year institution at entry into postsecondary earned a degree (any degree) within four years after high school graduation.
- Across all cohorts, the rates of persistence to year two for students attending PA 2- and 4-year institutions are significantly higher than the rates for retention to year two for these students.
- The persistence and retention rates for PA high school graduates attending 4-year institutions in PA are significantly higher than the rates for students attending 2-year institutions.
- Half (50.2%) of PA high school graduates who enrolled at a 4-year institution graduated within four years, compared to 59 percent of students who attended an out-of-state 4-year institution.
- PA students who attended public out-of-state institutions had slightly higher persistence rates to year two (89%) than students who attended public institutions in PA (81%). This effect is similar for retention to year two.
- Similar to persistence and retention to year two, across all cohorts, persistence and retention to year three was higher for PA students who attended private postsecondary institutions than for students who attended public PA institutions.
- Among PA high school graduates who enrolled in a postsecondary institution in the fall immediately after high school graduation, the percentage of students who graduated within four years of high school completion was significantly higher for students who entered private institutions (59.2%) versus students who entered public institutions (41.2%).
- The odds for persistence to both year two and three are significantly higher for students who enroll initially at a full-time status and at 4-year institutions.
- The odds of a student continuing into year three (persistence to year three) are over three times higher for students who enrolled initially at a 4-year institution – despite only 27 percent of students who enrolled initially at a 2-year institution graduating with any degree within four years.

Project Overview and Objectives

The success of students in Pennsylvania (PA) has been deemed a top priority in the Governor's commitment to strengthen the education system, which can lead to improved opportunities for PA students and make the path to a postsecondary education more accessible.

The research questions addressed in this report can aid policymakers in making informed decisions that will better prepare PA students for the transition to postsecondary education and lead to higher rates of degree attainment. The research questions addressed in this report are directly aligned with the following Governor's Strategic Plan Priority Goals:

- **Priority Goal #2** - ESSA: To Prepare all students to graduate high school college-ready and career-ready and to be engaged citizens of the commonwealth.
- **Priority Goal #5** – Higher Education: To promote access, affordability and performance in higher education through strategies to expand opportunity for students and align with employer needs and to support the commonwealth's public institutions of higher education in achieving these goals.

The goal was to utilize already existing data available through PDE's longitudinal data system to achieve our major objectives while also answering the following priority research questions within two of PDE's major Research Agenda areas:

P-20 Policy:

- Do Grade 7 math scores predict a student's ability to graduate from high school and continue with postsecondary education?
- Does enrollment in algebra for Grade 8 or Grade 11 math predict postsecondary enrollment?
- Are some racial/ethnic or geographic populations (rural/urban comparison) doing better or worse than others in terms of educational attainment (B.A., A.A., 2-year certificate, 1-year certificate, industry credential)?

Postsecondary Education:

- Does math course taking, score on PSSA or Keystone passage increase the likelihood of enrolling, persisting and graduating from a postsecondary institution?
- Does enrollment in honors or AP courses or participation in dual enrollment increase the likelihood of postsecondary enrollment and are there demographic differences? Postsecondary access? Postsecondary success?
- What are the retention rates for students attending Pennsylvania colleges? Are there differences by sector (public, private, two-year, etc.)?

The following additional sub-questions were also of interest and addressed:

- What is the description and breakdown of student cohort populations by year and grade?
- What are the effects of taking a rigorous course early in high school versus later in high school?
- To what extent does rigorous high school course taking (i.e. algebra, AP, IB, dual enrollment) and the timing of course taking define students' postsecondary path and success?
- Do early college credit opportunities through dual enrollment, participation in AP or the IB program make a difference?
- Using exploratory analyses, what factors are most highly associated with high school graduation, postsecondary enrollment, persistence, retention, and bachelor's degree completion within four years?

Literature Review

There continues to be a need for research that will increase postsecondary degree attainment with strategies and policies focused on improving the P-20 education pipeline (Blankenberger & Phillips, 2016). With a continually growing demand for careers with college degrees, it is imperative that students are successful in high school and go on to attend, persist, and graduate from postsecondary education. The National Student Clearinghouse (NSC) Research Center reported that 73.9 percent of all students who began college in the fall of 2017 persisted into the fall of 2018. Of these same students, only 61.6 percent were reported to have been retained at their starting institution (NSC, 2019). Factors including high school algebra enrollment (Gaertner, Kim, Desjardins & McClarty, 2013), rigorous high school course taking patterns (Long, Conger & Iatarola, 2012), and standardized test scores (Westrick, Le, Robbins, Radunzel & Schmidt, 2015) have all been found to be associated with postsecondary outcomes, including educational attainment.

Given increasing economic demands that require a highly educated and skilled workforce (Carey, 2004; Lotkowski, Robbins & Noeth, 2004; Us. Department of Labor, 2015), a focus on research that can inform strategies to improve students' successful transition into postsecondary can lead to better outcomes for students. This includes successful completion and degree attainment in order to meet developing workforce demands and guide policies aimed at improving the pipeline between secondary and postsecondary education (Blankenberger & Phillips, 2016).

Factors including high school algebra enrollment, rigorous high school course taking patterns, and standardized test scores have all been found to be associated with postsecondary outcomes, including educational attainment.

Methodology and Sample

Three cohorts of Pennsylvania students were followed from Grade 9 entry in school years 2010-2011, 2011-2012, and 2012-2013 and two 7th grade cohorts were followed from entry in school years 2010-2011 and 2011-2012 to various points in postsecondary study depending on the cohort. Table 1 provides a detailed description and breakdown of student cohort populations and how each cohort could be tracked through postsecondary enrollment and completion.

Research questions were addressed through the analysis of linked Pennsylvania Information Management System (PIMS) and National Student Clearinghouse (NSC) data.

PIMS data were obtained for school years 2010-2011 through 2016-2017 for three cohorts of Grade 9 students and two cohorts of Grade 7 students. NSC records were obtained through 2017/2018 for PA high school graduates from school years 2014, 2015, 2016, and 2017.

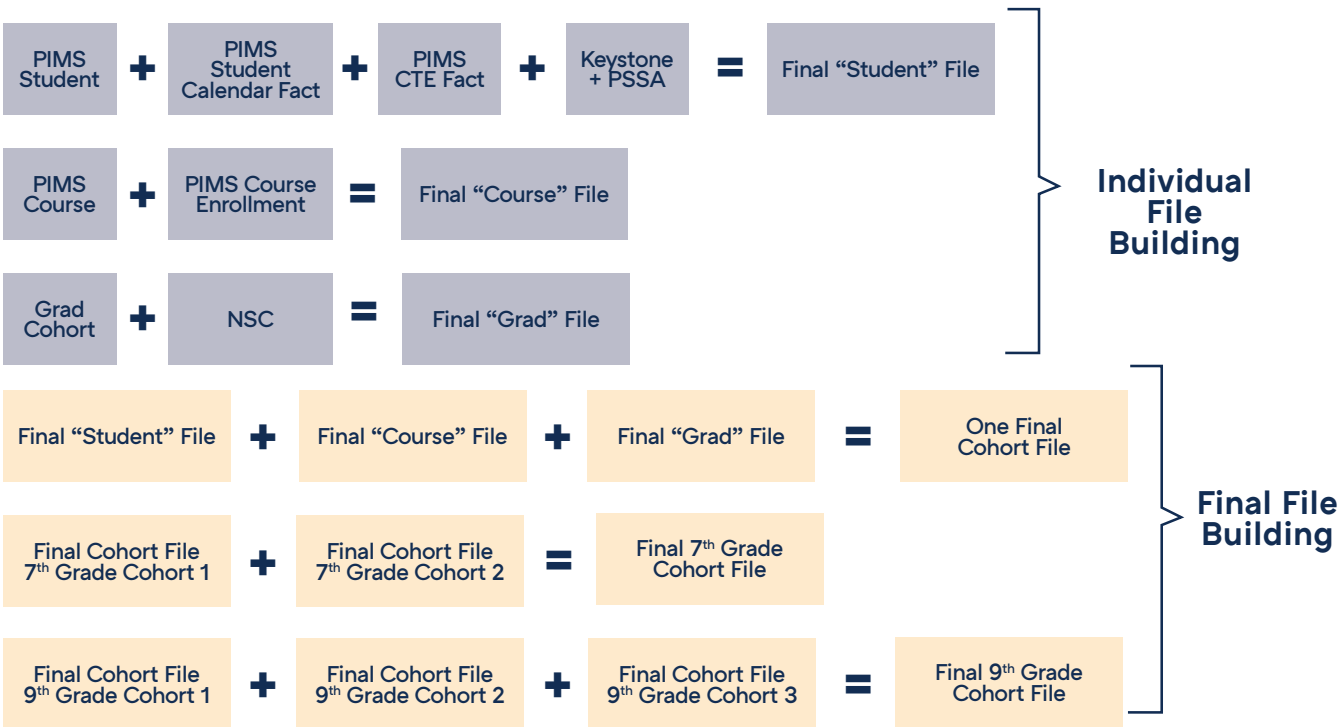
Various PIMS templates were used to gather demographic and descriptive data of the sample. These templates, and the linking process which details how templates and files were merged, can be found in Figure 1. Indicators were either provided or were developed to describe various courses in the course enrollment data (AP, IB, Dual Credit, algebra, Rigorous, Advanced) and grand totals and dichotomous indicators (enrolled in at least one course or no enrollment) for each student were created to assess overall course taking during high school. Information on the definitions of indicator categories and processes can be found in Appendix A.

TABLE 1: Postsecondary Outcomes Examined by Cohort

Outcome	9th Grade Cohort 1 (2010-2011) N=140,299	9th Grade Cohort 2 (2011-2012) N=139,071	9th Grade Cohort 3* (2012-2013) N=138,971	7th Grade Cohort 2 (2011-2012) N=139,702
On-time High School Graduation	✓	✓	✓	✓
College Entry	✓	✓	✓	✓
Persistence & Retention to Year Two	✓	✓	✓	
Persistence & Retention to Year Three	✓	✓		
College Graduation Within 4 Years	✓			
Retention to College Graduation	✓			
Degree Type at Graduation	✓			

**This 9th grade cohort subsumes the first 7th grade cohort who was enrolled in Grade 7 in 2010-2011.*

FIGURE 1. Linking Process for all Data Files



These data were analyzed using varied analytic methods, that included descriptive statistics, Analysis of Variance (ANOVA), Chi-Square (Pearson), and Logistic Regression analysis. Results were disaggregated and differentiated by student groups that are of interest to state policymakers and that include ethnicity, economically disadvantaged status, gender, EL, Special Education, and historically underperforming.

Conclusions

Brown & Conley (2007) defines "College Readiness" as the level of preparation a student needs in order to enroll and succeed, without remediation, in credit-bearing, general education courses at a postsecondary institution that offers baccalaureate degree or transfer to a baccalaureate program. For students in PA, the level of preparation from middle through high school in terms of course taking patterns and the resulting degree of preparedness can have huge implications as a measure of positive student outcomes and postsecondary enrollment and success. A student's high school course taking pattern can define their postsecondary path (Plank, DeLuca, & Estacion, 2008) and advanced high school courses provide curricula that is more challenging academically (Long et al., 2012). Similar to prior research, analysis of data over time for students who graduated from PA high schools from 2014 through 2017 showed a large effect and significant association between rigorous and advanced course taking in high school, including advanced algebra, and postsecondary enrollment and success.

Early college credit opportunities for students through AP or IB programs and dual credit enrollment opportunities are making a difference for students graduating from high schools in PA in terms of defining students' postsecondary path and success.

The findings indicate that there is a statistically significant effect of rigorous and advanced course taking for students in our cohorts and graduates from PA high schools (see Figure 1). The odds of on-time graduation from high school, postsecondary enrollment, persisting to year two and three, remaining at the same college, and graduating within four years of high school completion, increases with each additional advanced course taken. Consistent with prior research (Allen & Dadger, 1012; Chajewski, Mattern & Shaw, 2019; Long, Conger & Iatarola, 2012), analysis results showed that enrolling in just one rigorous or advanced course during high school (versus none) has huge implications for educational attainment and is associated with positive outcomes for students. These findings indicate that early college credit opportunities for students through AP or IB programs and dual credit enrollment opportunities are making a difference for students graduating from high schools in PA in terms of defining students' postsecondary path and success.

Additionally, taking an advanced algebra course during high school, the timing of Algebra I, Grade 8 PSSA and Keystone performance are all significantly associated with an increase in odds of on-time high school graduation, postsecondary enrollment (see Figure 3 for differences based on Keystone performance), persistence and retention, even after controlling for other significant explanatory variables. A significant effect of advanced course taking, advanced algebra enrollment, and Keystone performance for students in our 9th grade cohorts and graduates from PA high schools, remains even after controlling for other significant explanatory variables.

FIGURE 2: Association between Advanced Course Taking and Postsecondary Outcomes

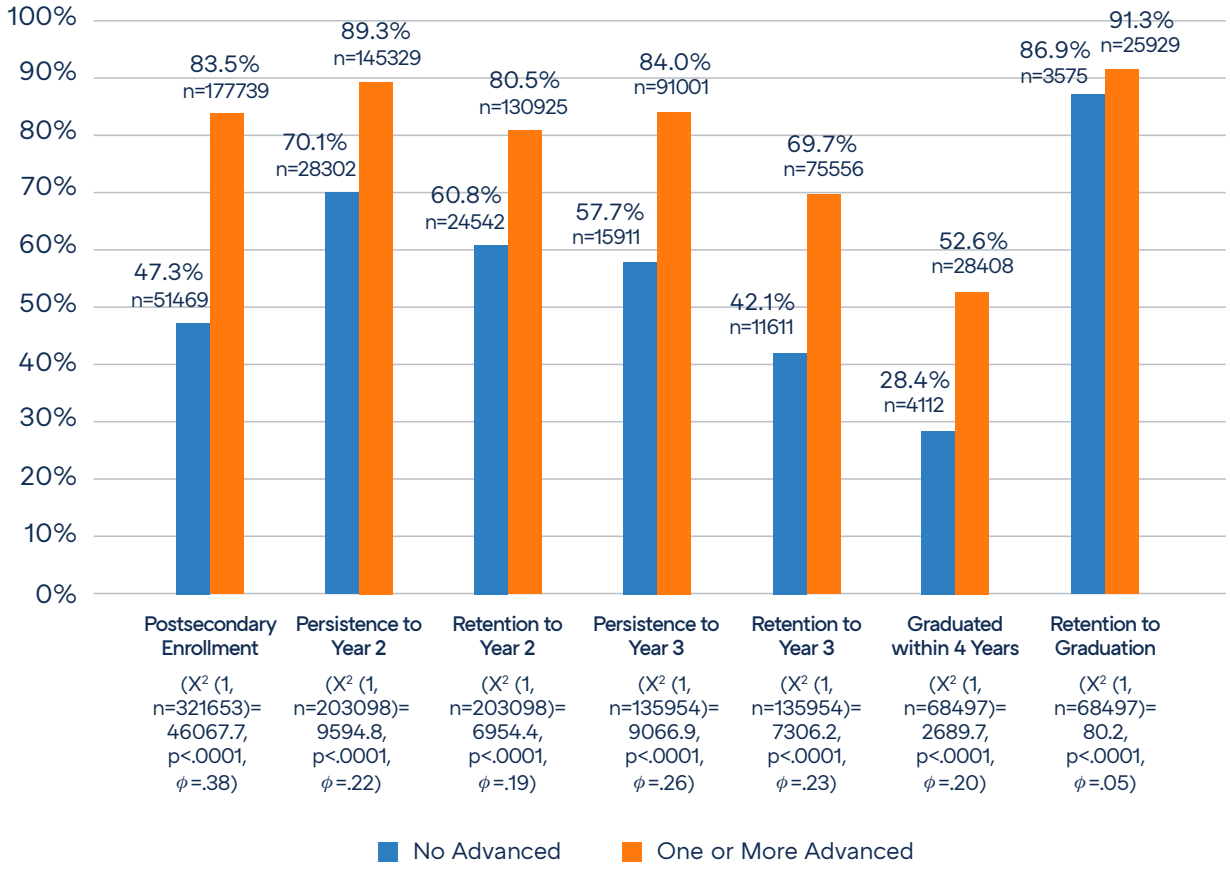
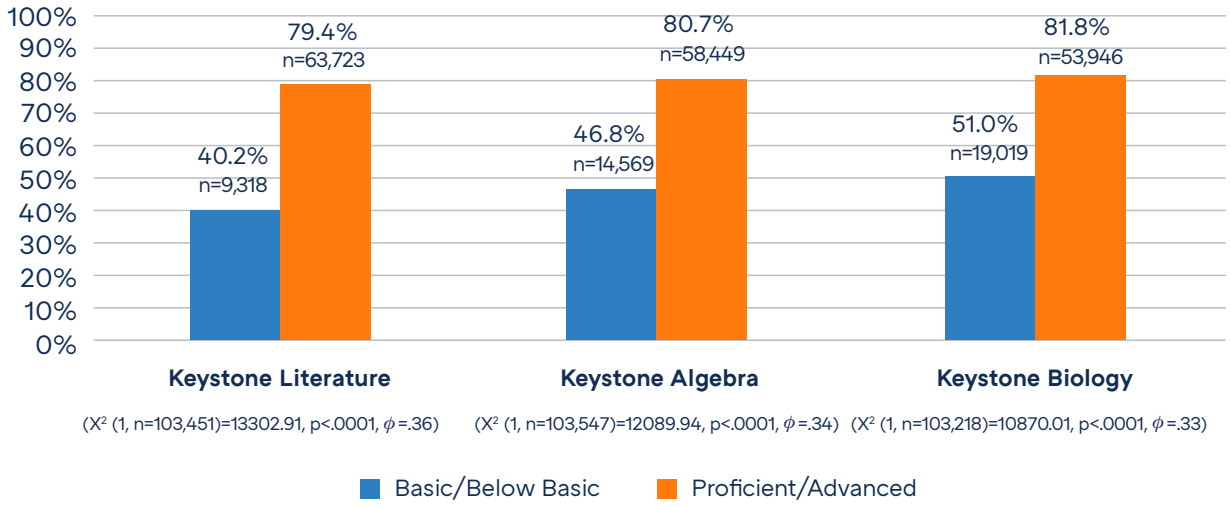
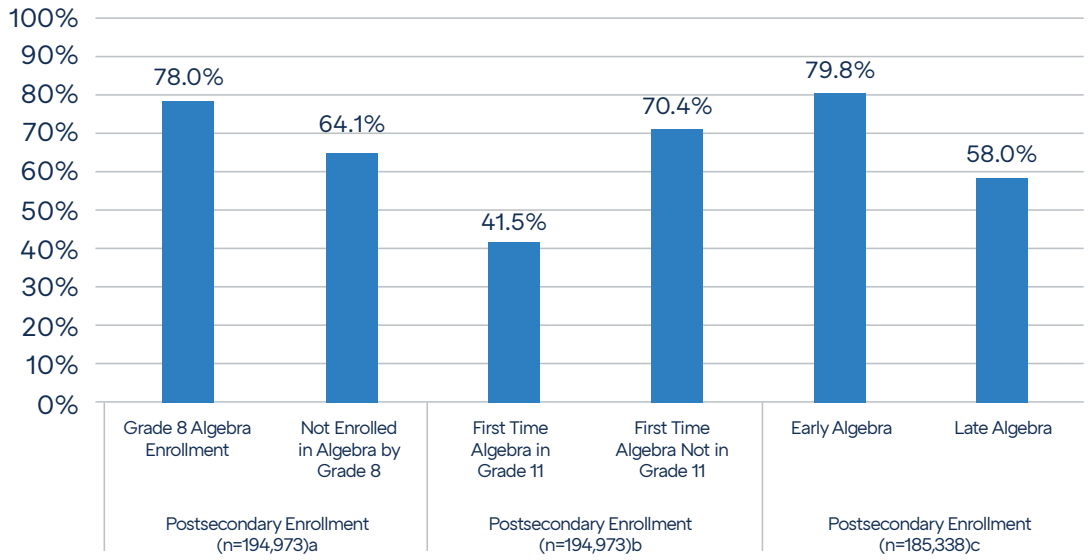


FIGURE 3: Association between Keystone Achievement Levels and Postsecondary Enrollment



The timing of enrollment in Algebra I (see Figure 4) was also found to be significantly associated with and a very important precursor of the probability of a student enrolling in a postsecondary institution following high school graduation. However, defining early versus late timing for enrollment is important as analysis results suggest that early timing, defined as enrollment in Algebra I in "*middle school*," when compared to late timing (high school) has the largest effect with a moderate positive association (ϕ = .24, p < .0001).

FIGURE 4: Association between Algebra I Timing and Postsecondary Enrollment among 7th Grade Cohorts



a: $\chi 2(1, N = 194{,}973) = 4{,}4663.87$, $p < .0001$; $\phi = .15$, $p < .0001$.
b: $\chi 2(1, N = 194{,}973) = 575.65$, $p < .01$; $\phi = .05$, $p < .0001$.
c: $\chi 2(1, N = 185{,}338) = 10{,}316.45$, $p < .0001$; $\phi = .24$, $p < .0001$.

Although enrollment in an advanced algebra course, including Algebra II, was not originally one of the research questions to be addressed through this study, a dichotomous indicator was developed and tested to determine the effects of enrollment in high school for PA students and examine the extent of the association in comparison to Algebra I. Logistic regression analyses confirmed a significant association between taking an advanced algebra course and postsecondary outcomes. These results are similar to other studies that found that enrollment in Algebra II can influence college outcomes, including persistence and graduation (Gaertner et al., 2013). The effects of taking an advanced algebra course in high school decreased after entry into the second year of postsecondary. Although advanced algebra was found to increase the odds of on-time high school graduation, postsecondary enrollment, and persistence to year two, it had no significant association with persistence to year three, retention to year two and three, or postsecondary graduation within four years of high school completion. Interestingly, although the effect of taking an advanced algebra course in high school diminished over time for the students in these cohorts, the significant effect of the number of advanced courses taken in high school remains for all postsecondary outcomes, including graduation within four years of high school completion.

The odds for persistence to both year two and three are significantly higher for students who enroll initially at a full-time status and at

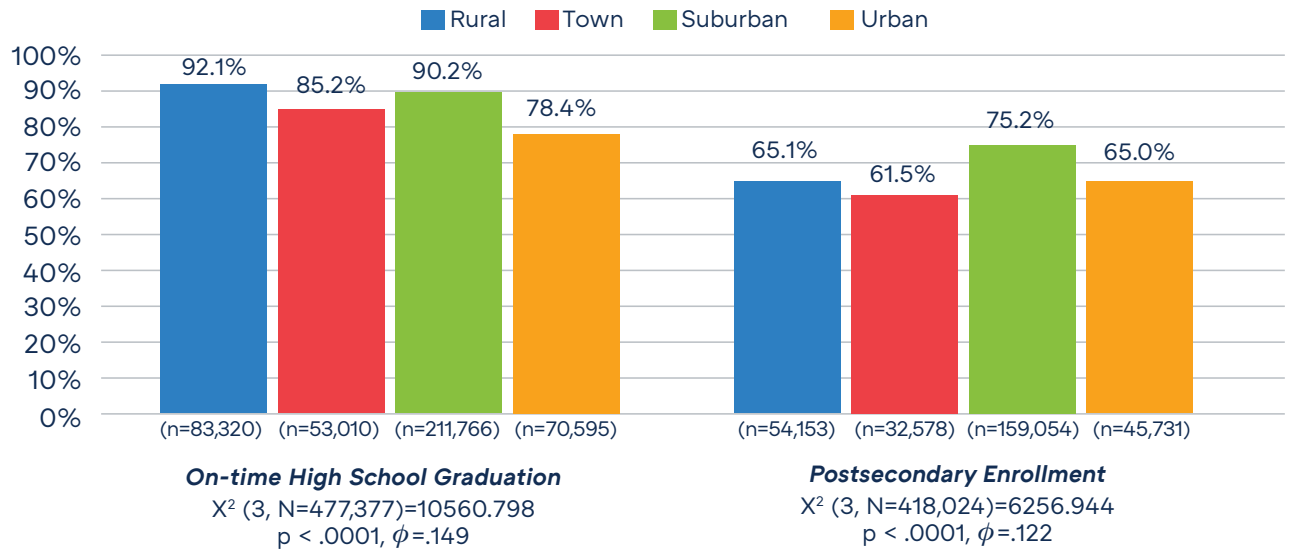
The odds for persistence to both year two and three are significantly higher for students who enroll initially at a full-time status and at 4-year institutions.

4-year institutions. However, the odds of a student continuing into year three are over three times higher for students who enroll initially at a 4-year institution, despite only 27 percent of students who enrolled in 2-year institutions initially graduating within four years with any degree.

There were a few significant differences based on geographical region. Figure 5 shows that for postsecondary enrollment, students who graduated from high schools in suburban regions had higher odds of postsecondary enrollment when compared to students from other regions. For persistence to year two and year three, and graduation within four years of high school completion, students from urban (city) regions had lower odds of persistence and graduation within four years of high school completion.

Further, some previous research has found socioeconomic status to be a weak predictor of academic performance and retention (Westrick, Le, Robbins, Radunzel & Schmidt, 2015). However, our analysis on data for PA students showed that students from the economically disadvantaged student group as well as students within the historically underperforming student group had a lower probability of on-time high school graduation, postsecondary enrollment, persistence, retention, and graduation within four years of high school completion when compared to other students.

FIGURE 5: On-Time High School Graduation & Postsecondary Attainment based on Geographical Region



On-time High School Graduation
X^2 (3, N=477,377)=10560.798
p < .0001, ϕ=.149

Postsecondary Enrollment
X^2 (3, N=418,024)=6256.944
p < .0001, ϕ=.122

Given the focus on educational improvements that can facilitate the successful transition to postsecondary education, these results can inform state and local policy initiatives that aim to increase the number of students taking advanced and rigorous courses and potentially increase the number of students who enroll in postsecondary institutions and persist through degree attainment.

Caveats

Although the magnitude of most of the effects were found to be moderate to large and consistent with prior research, there is still a lot of variance left to explain when predicting on-time high school graduation, and postsecondary enrollment, success, and degree attainment within four years of high school graduation. Although the data obtained for this study allowed us to track students longitudinally, the data available to us did not include any information on additional student level or familial characteristics outside of economically disadvantaged status. Additionally, prior research has shown a

strong association between high school GPA and postsecondary outcomes. GPA is not collected as part of the PIMS, and therefore could not be tested in our analyses. Further, teacher and school level variables were not included in our analyses but could potentially be examined in the future as part of a secondary analysis of data. The initial variables considered for inclusion in analytic models included a measure of postsecondary institution selectivity. That data could not be obtained in time for use in this study but may be obtained eventually for secondary analyses. Lastly, although course enrollment information is available through PIMS for students in PA schools, information on successful course completion and performance is not available. The inclusion of measures of performance would improve the predictive models and provide a better estimate of the true effects of course taking patterns. Additionally, previous research has shown that rigorous courses taken in different subject areas may have varying effects (Long et al, 2012). Although specific subject areas of rigorous and advanced courses were not a focus of this study, it could be examined in the future.

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Appendix A

List of Operational Definitions

1. **A Rigorous course** refers to any course defined as such by the Pennsylvania Department of Education (PDE). This includes any course that meets the Pennsylvania reporting standards for Advanced Placement (AP), Dual Credit, or International Baccalaureate (IB). Additionally, a CTE student who has completed 50 percent or more of their CTE program is included in PDE's definition of rigorous course taking students.
2. **An Advanced course** refers to any class that meets the listed requirements for a rigorous course or is designated by a PA Local Educational Agency (LEA) as honors or gifted. Because PA LEAs are not required to report honors or gifted courses, totals of such across geographical regions would be incomplete. However, honors and gifted courses that are reported, in addition to rigorous courses, paint a more complete picture of advanced course taking in PA.
3. **Postsecondary persistence** is defined as continued enrollment (or degree completion) at any higher education institution in the fall semesters of a student's first and second year (NSC, 2018).
4. **Postsecondary retention** is defined as continued enrollment (or degree completion) within the same higher education institution in the fall semesters of a student's first and second year (NSC, 2018).
5. **Persistence to Graduation** for the purpose of our study is defined as having graduated within four years from high school completion.
6. **Retention to Graduation** is defined as having graduated from the same higher education institution where a student began.

POL PK-20 Policy

ECE Early Childhood Education

K12 K-12 Education

PSE Postsecondary Education

WRK Workforce

LIB Public Libraries

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The mission of the Department of Education is to ensure that every learner has access to a world-class education system that academically prepares children and adults to succeed as productive citizens. Further, the Department seeks to establish a culture that is committed to improving opportunities throughout the commonwealth by ensuring that technical support, resources, and optimal learning environments are available for all students, whether children or adults.