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2-1-2023

Arkansas's 9th Grade Course Failures and Building Configurations

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Summary Points

- Ninth graders attending schools that terminate at 9th grade are 29.1 percentage points less likely to fail a course than their peers attending schools that serve other high school grades.
- Controlling for prior achievement and student characteristics, students attending buildings terminating at 9th grade are 9.2 percentage points less likely to fail a course in 9th grade than those in traditional 9-12 high schools.
- We suggest the difference is due to a focus among school leaders and faculty on the importance of student-success in 9th grade.

Arkansas 9th Grade Course Failures and Building Configurations

In this brief, we examine the relationship between course failures among Arkansas’s 9th grade students and the grade levels served in their school. We find that in schools that terminate at 9th grade, 9th graders are less likely to fail one or more course during the year compared to failure rates in schools that terminate at 12th grade. We suggest an increase in awareness and examination of how we assess 9th graders in Arkansas.

Introduction

Ninth grade is becoming more widely known among researchers as the make-or-break year for completing high school (McCallumore & Sparapani, 2010). Ninth graders are reported as having the most missed classes, the majority of failing grades, the most behavior referrals, and the lowest GPAs out of any grade in high school (McCallumore & Sparapani, 2010). Focusing on academic success of 9th graders is important as the University of Chicago’s Consortium on School Research finds 9th grade GPA to be highly correlated with future academic successes (Easton et al., 2017). The Office for Education Policy found 9th grade GPAs of Arkansas students to be strongly associated with high school graduation and college enrollment (Morris et al., 2021).

Ninth grade can be a tough transitional year for students; many experience their grades declining for the first time, and

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they have self-esteem issues, friendship changes, and developmental changes (Chen, 2021; Reents, 2020). Economically disadvantaged students experience the highest chance of academic loss in the 9th grade year transition (Seeskin et al., 2018). Hannah and Linden (2012) find teachers grade economically disadvantaged students more harshly than advantaged students.

One way to ameliorate the environmental disturbance and transition many students face is to serve 9th grade students at junior high schools or in a school of their own. Buildings dedicated to 9th grade students allow faculty to focus on 9th graders, giving them the guidance and support they need for success (Elam, 2021). Descriptively, a Houston district found lowered dropout rates, increased attendance rates, a rise in test scores, and improved behavior at ninth-grade schools, and Pennsylvania researchers found ninth-grade schools ease the stress of transition to high school (Reents, 2020). Making 9th grade a non-transitional year can help 9th graders feel less anonymous and lost (Somers & Garcia, 2016). Levels of parental involvement are higher when 9th grade is a non-transitional year, translating to 9th graders having more adults in their lives focused on their success (Chen, 2021).

Overall, research points to higher levels of academic and social success for 9th graders when 9th grade is not a transitional year. Researchers admit, however, that more studies need to be conducted to indicate if keeping 9th grade students out of high school buildings is truly impactful and causal (Elam, 2021; Somers & Garcia, 2016; Starke, 2016). We aim to examine Arkansas's 9th grade students' success further.

Study Design

Our research will answer the following questions:

- What are the 2017-18 and 2018-18 school building configurations in Arkansas and their enrollments for 9th grade students?
- Does the likelihood of failing one or more courses in 9th grade year vary in differing Arkansas school building configurations after controlling for student demographic characteristics, prior academic achievement, and district characteristics?

Our anonymized sample is comprised of 65,851 first-time 9th graders in Arkansas from 2017-18 and 2018-19. Data include student demographic characteristics, programmatic characteristics, achievement on state assessments in ELA and math, and course grades. A binary failure indicator is created for course grades of F, E, NC, I-0, or 59 and below. The descriptives of our pooled sample are in Table 1.

Table 1: Student demographic and programmatic descriptives, 2017-18 and 2018-19 pooled sample

| Total N | 65,141 |
|-----------------------------|--------|
| % Male | 51.0 |
| % White | 62.8 |
| % Black | 18.5 |
| % Hispanic | 13.3 |
| % Other Races | 5.5 |
| % Free-or-Reduced Lunch | 59.3 |
| % Gifted and Talented | 13.1 |
| % English Language Learners | 7.3 |
| % Special Education | 10.5 |

The free-or-reduced lunch (FRL) program indicator is our proxy for students who are lower socioeconomic status. Gifted and Talented (GT) is the indicator for students in the gifted and talented program; English Language Learners (ELL) is the indicator for students learning English as a second language; and Special Education (SPED) is the indicator for students receiving special education services. We include these characteristics as well as gender and race because all have an association with the likelihood of course failure.

Analysis

There were nine different building configurations attended by 9th grade students in the sample. School building configurations vary in Arkansas and are locally determined. Information about the number of schools, percentage of FRL students in the building, and total and average number of 9th grade students in the pooled sample by building configuration is presented below in Table 2.

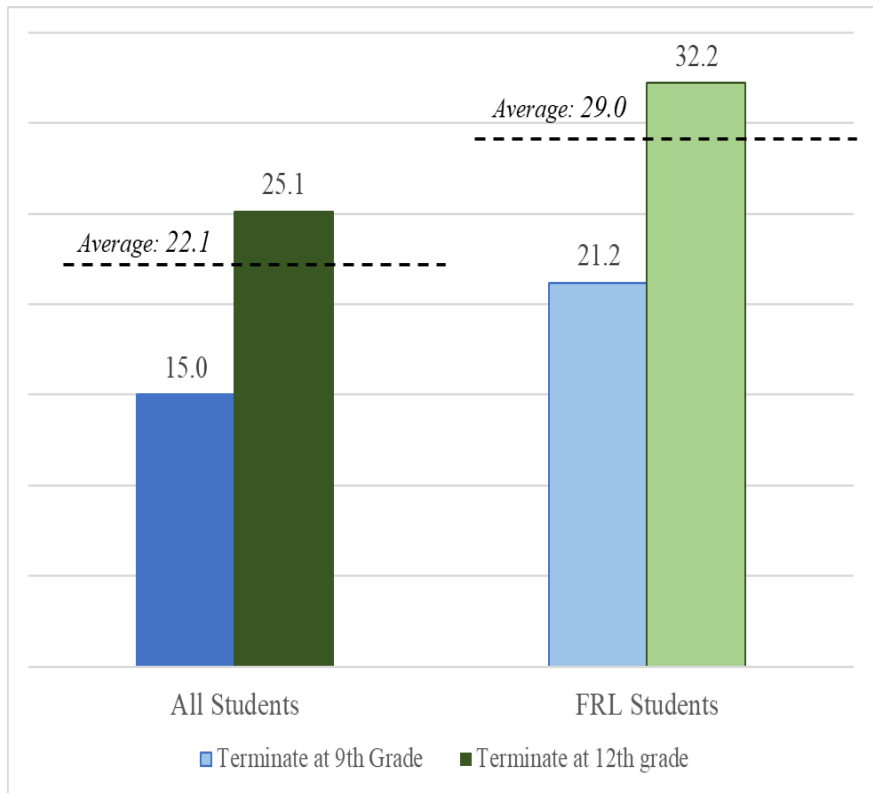
Table 2: Building configuration descriptives, 2017-18 and 2018-19 pooled sample

| Building Configuration | Number of Schools | Percent of FRL | 9th Grade Students | Average 9th Grade Enrollment | Percent of Sample |
|-------------------------|-------------------|----------------|--------------------|------------------------------|-------------------|
| Total | 304 | 54.7 | 65,141 | 214 | 100.0 |
| Terminate at 9th grade | 38 | 54.6 | 19,082 | 502 | 29.3 |
| 7 through 9 | 22 | 60.1 | 7,595 | 345 | 11.7 |
| 8 through 9 | 12 | 55.8 | 8,129 | 677 | 12.5 |
| 9 only | 4 | 39.2 | 3,358 | 840 | 5.2 |
| Terminate at 12th grade | 266 | 54.8 | 46,059 | 173 | 70.7 |
| K through 12 | 16 | 58.7 | 978 | 61 | 2.0 |
| 5 through 12 | 3 | 68.3 | 201 | 67 | 0.3 |
| 6 through 12 | 7 | 71.2 | 567 | 81 | 0.9 |
| 7 through 12 | 112 | 63.3 | 9,454 | 84 | 14.5 |
| 8 through 12 | 5 | 43.2 | 1,417 | 283 | 2.2 |
| 9 through 12 | 123 | 52.5 | 33,442 | 272 | 51.3 |

Seventy-one percent of students in our sample attend schools that terminate in 12th grade. The percentage of 9th grade students designated FRL is similar across the most common building configurations, ranging from 53-63%. Only 39.2% of 9th graders are designated FRL status in buildings that serve only 9th grade. Building configurations serving grades 5 through 12 and 6 through 12 enroll about 70% of 9th graders designated FRL status. On average, 8th through 9th and 9th grade only buildings enroll the greatest number of 9th graders.

In our prior research “Arkansas High School Freshmen Course Failures”, we find about 22 percent of Arkansas’s 9th graders fail at least one course during 9th grade. Moreover, 29 percent of Arkansas’s 9th graders designated FRL status fail at least one course during 9th grade (Morris & McKenzie, 2022). When examined by building configuration, we find students attending buildings that terminate in 9th grade are 10 percentage points less likely to fail a course during 9th grade than those attending buildings that terminate in 12th, as we present in Figure 1. Economically disadvantaged students, designated as FRL status, are about 11 percentage points less likely to fail a course during 9th grade than those attending buildings that terminate in 12th grade.

Figure 1: Percentage of students failing a 9th grade course, by building terminal grade, 2017-18 and 2018-19 pooled sample



In Table 3, we present the building configuration percent of students designated FRL, and failure percentages for students overall as well as those who participate in the FRL program. Buildings serving grades 6-12 have the highest percentage of students designated FRL, while buildings only serving 9th grade students have the lowest percentage of students designated FRL. Buildings serving grades 5 through 12 have the highest failure percentage at

Table 3: Building configuration percent of students FRL, failure percentages, and FRL failure percentages, 2017-18 and 2018-19 pooled sample

| Building Configuration | Number of Schools | Percent of students FRL | Failure Percentage | FRL Failure Percentage |
|-------------------------|-------------------|-------------------------|--------------------|------------------------|
| Total | 304 | 54.7 | 22.1 | 29.0 |
| Terminate at 9th grade | 38 | 54.6 | 15.0 | 21.2 |
| 7 through 9 | 22 | 60.1 | 16.8 | 22.2 |
| 8 through 9 | 12 | 55.8 | 15.2 | 21.1 |
| 9 only | 4 | 39.2 | 10.4 | 18.2 |
| Terminate at 12th grade | 266 | 54.8 | 25.1 | 32.2 |
| K through 12 | 16 | 58.7 | 39.7 | 44.9 |
| 5 through 12 | 3 | 68.3 | 47.8 | 47.2 |
| 6 through 12 | 7 | 71.2 | 29.1 | 30.7 |
| 7 through 12 | 112 | 63.3 | 22.6 | 28.0 |
| 8 through 12 | 5 | 43.2 | 23.4 | 32.7 |
| 9 through 12 | 123 | 52.5 | 25.3 | 33.1 |

47.8, while ninth-grade buildings' students have the lowest percentage of students failing at 10.4 percent. Lastly, buildings serving 5-12 have the highest percentage of failures for students designated FRL at 47.2 percentage failing at least one course, whereas buildings only serving 9th grade students have the lowest failure rates for students designated FRL 9th graders, with only 18.2 percent failing at least one course.

To compare the likelihoods of which school building configurations are more likely to be associated with ninth graders failing one or more courses, we construct a regression composed of student-level demographic and programmatic characteristics, prior academic achievement on state assessments in ELA and math, and district enrollment characteristics. Student-level demographic and programmatic characteristics, prior academic achievement on state assessments in ELA and math, and district characteristics may influence the likelihoods of failure between building configurations, so we account for these in our analysis.

Percentage point likelihoods of course failures are the result of being a comparison to being in other building configurations. For example, if we are reporting the 9-12 grade level building configuration, it is compared to the buildings that are not 9-12 grade level configurations. The building failure likelihood rates of ninth grade students for each building configuration and their corresponding FRL failure likelihoods are found in Table 4.

Table 4: Building configuration failure likelihoods and FRL student failure likelihoods, 2017-18 and 2018-19 pooled sample

| Building Configuration | Building Failure Likelihood | FRL Student Failure Likelihood |
|-------------------------|-----------------------------|--------------------------------|
| Total | | |
| Terminate at 9th grade | | |
| 7 through 9 | -23.8 | -3.3 |
| 8 through 9 | -28.7 | -8.9 |
| 9 only | -32.8 | -5.9 |
| Terminate at 12th grade | | |
| K through 12 | 24.9 | 19.4 |
| 5 through 12 | 26.4 | 20.0 |
| 6 through 12 | 19.6 | 10.1 |
| 7 through 12 | -7.1 | NS |
| 8 through 12 | NS | NS |
| 9 through 12 | NS | 4.6 |

Note: All results are $p < 0.01$; NS = not significant

Our likelihood value of interest is for buildings that terminate in 9th grade. The results indicate that after accounting for prior academic achievement, student demographic and programmatic characteristics, and district characteristics, 9th graders in these buildings are 29.1 percentage points less likely to fail one or more courses compared to 9th graders attending the building configurations that terminate in 12th grade.

The students designated FRL failure likelihoods compare students designated FRL in a certain building configuration compared to similar students in other building configurations. For example, if we are reporting the students designated FRL in the 9-12 grade level building configuration, it is compared to the students designated FRL in buildings that are not 9-12 grade level configurations.

Our comparison of interest, students designated FRL in buildings terminating at 9th grade, are about 8 percentage points less likely to fail compared to students designated FRL in buildings terminating at 12th grade. It is important to note that while all these results are statistically significant, we cannot claim causality.

To compare the likelihood of course failures when 9th grade is a transitional year, we narrow our analysis to four building configurations: 7-9 grades, 8-9 grades, ninth-grade, and 9-12 grades. The results of this regression are presented in Table 5. After controlling for prior academic achievement, student demographic and programmatic characteristics, and district characteristics, 9th graders in the non-transitional buildings are 9.2 percentage points less likely to fail one or more courses compared to the 9-12 grade buildings

To measure the course failure likelihood of 9th grade only buildings in Arkansas, we narrow the sample further to 9th grade only buildings and 9-12 grade buildings. Students attending 9th grade only buildings are 9.8 percentage points less likely to fail a course their 9th grade year compared to 9th graders attending 9-12 grade buildings. We present these results in Table 5.

Table 5: Building configuration failure likelihoods compared to traditional 9-12 grade buildings, 2017-18 and 2018-19 pooled sample

| Variables | Building Failure Likelihood | FRL Student Building Failure Likelihood |
|---------------------------------|-----------------------------|---|
| Terminate at 9th grade vs. 9-12 | -9.2 | -5.9 |
| 9th only vs 9-12 | -9.8 | -4.1 |

Note: All results are $p < 0.01$

Students designated FRL in buildings terminating at 9th grade are about 6 percentage points less likely to fail a course compared to students designated FRL in the traditional high school building configuration serving grades 9-12. Students designated FRL attending buildings that serve ninth-grade only are 4 percentage points less likely to fail a course compared to the students designated FRL in the traditional high school building configuration serving grades 9-12. These results are statistically significant at the 99% confidence level.

These regression analyses account for 19-22% of the variance of course failures for 9th graders across Arkansas's differing school building configurations. We control for student-level demographic and programmatic characteristics, prior academic achievement on state assessments in ELA and math, and district characteristics, but there are additional factors such as teachers or course content that likely contribute to students' success in 9th grade.

Though our model is not causal, as students are not randomly assigned to a school, we find statistically significant differences in the likelihood of failure between school building configurations.

Discussion

Our study examines the school building configurations attended by Arkansas's 9th graders during the 2017-18 and 2018-19 school years. We find attendance at school buildings that terminate at 9th grade is statistically significantly associated with a lower likelihood of failing one or more courses in 9th grade after controlling for student-level demographic and programmatic characteristics, prior academic achievement on state assessments in ELA and math, and district characteristics.

Consistent with prior research, our results should also be interpreted with caution (Elam, 2021; Somers & Garcia, 2016; Starke, 2016). Sample sizes and student demographic groups for some building configurations are too small to generate statistically significant comparisons. Lower likelihoods of failure for the combined 7-9 grades, 8-9 grades, and 9th grade only configurations may be associated with the lack of transition to a new building, or perhaps may be due to greater awareness of and focus on the success of 9th graders in those buildings. The school staff in buildings that terminate in 9th grade might have a more specific perspective on what is developmentally appropriate for 9th grade students' success and be more cognizant of the educational impacts of success in the 9th grade year.

Policy Implications

For buildings with higher rates of 9th grade failures or where 9th grade as a transitional year is unavoidable, some steps can be taken to help ease the academic and social difficulties many 9th graders face. Administration can implement calls to action to increase community across their buildings (Lizar, 2017). Meetings can be conducted across 9th grade teachers to ensure student needs are being met, and mentors can be assigned to particular groups of 9th graders in greater need of academic and social supports (Smith-Mumford, 2004). The Everyone Graduates Center at Johns Hopkins School of Education recommends implementing the Freshman Seminar for aiding 9th grade students in studies and social skills (Willen, 2013). In Portland, Oregon, Self-Enhancement Inc. works with the high-risk 9th grade students of each school setting goals and providing aide 24/7 (Willen, 2013). Moreover, the Sports and Arts in Schools Foundation in New York City brings in support staff to encourage 9th graders intervention activities and with after-school sports and arts (Willen, 2013). For school building structures where 9th grade continues to be a transitional year without proper transitional programs in place by administration, students are at risk for academic failures (Reents, 2020).

Studies show that offering mentorship support to lower-socioeconomic students can boost their academic performance. Malecki and Demaray (2016) encourage schools to implement such programs. Park and Denson (2013) highlight the importance of creating a sense of belonging for economically disadvantaged students by fostering relationships between them and their teachers.

Office for Education Policy

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We highlight the issue of grading disparities among students from low-income families and encourage educators and district leaders statewide to address the possibility of grading bias for economically disadvantaged students.

We want to caution districts with school buildings terminating at 12th grade as we find these are more likely to fail their 9th grade students even after accounting for student prior achievement and characteristics. We encourage school leaders to evaluate grading practices and 9th grade interventions in their districts to ensure all students have equitable chances for course success. As the OEP team works to evaluate various equitable-grading practices across the state, we encourage districts to more deeply reflect upon their own grading practices. As we find 9th grade academic successes to be highly correlated with high school graduation and college enrollment (Easton et al., 2017; Morris & McKenzie, 2022), district leaders should focus on 9th graders' academic and social transitional needs to increase the likelihood of longer term success for Arkansas students.

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