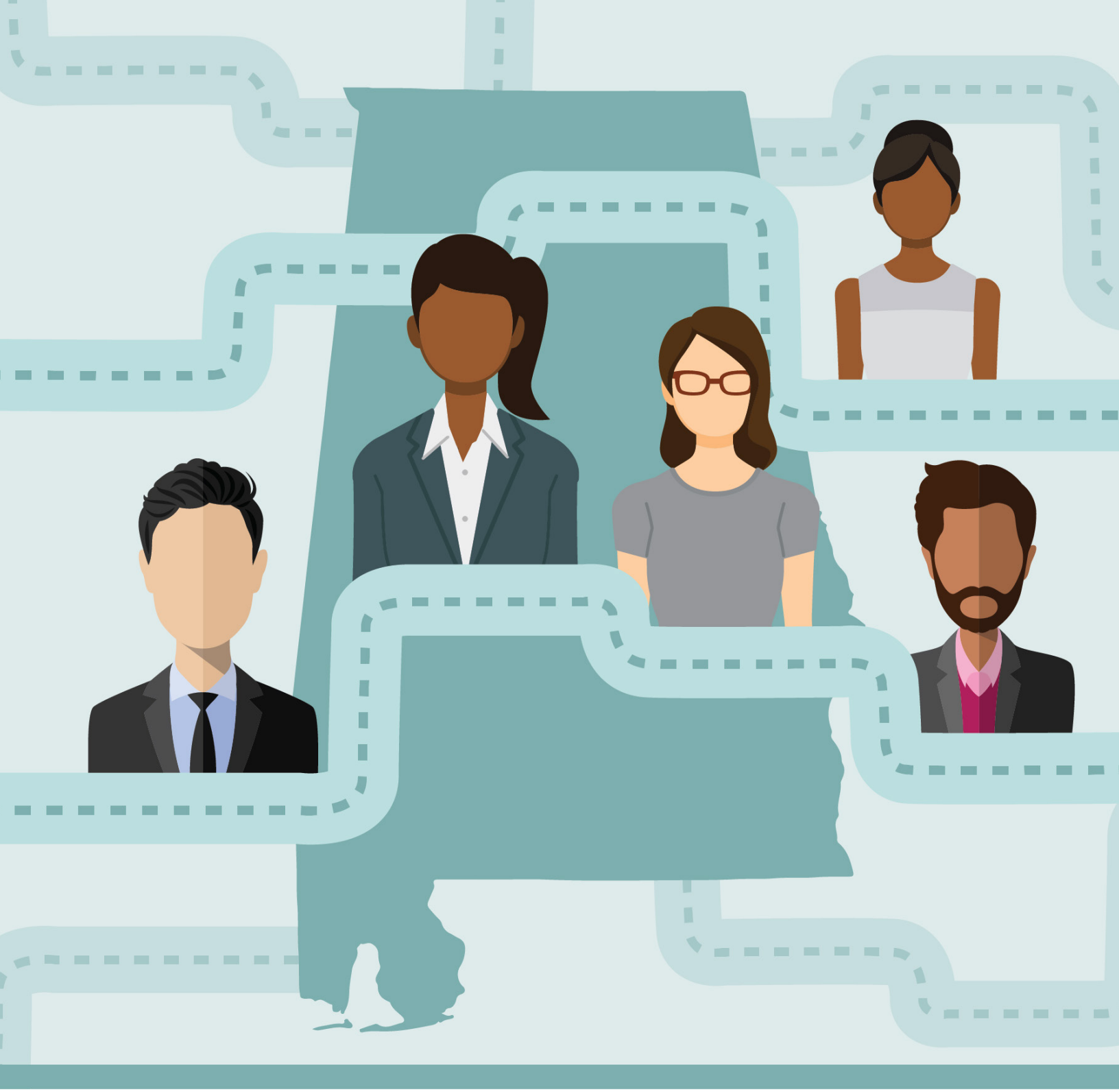

Promoting Career Readiness in Alabama High Schools

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Conclusions

A short survey was sent to Alabama high schools with greater-than-expected ACT® WorkKeys® performance with the goal of identifying effective practices for promoting career readiness. Six of the 10 schools contacted responded to the survey. All respondents integrate career readiness into their regular curricula, whether through co-op programs, dual-credit initiatives, or certification programs. All responding schools use WorkKeys-specific test preparation materials and set aside class time for students to engage with those materials. Many of the responding schools have relationships with businesses in their communities and communicate hiring requirements from these businesses to their students. These relationships are additionally fostered through career fairs.

So What?

This study highlights the importance of clear communication in fostering career readiness. Students exhibit higher motivation on achievement tests when they understand the value of an assessment and are able to familiarize themselves with the exam prior to testing. Increased communication regarding the work requirements of local employers can further contribute to career readiness.

Now What?

While several of the interventions described by survey respondents would require significant time and effort (e.g., integrating career programs into regular curricula), many of the practices outlined in this report would be, in terms of time and effort, easy to implement. Communicating the work requirements of local employers could be done directly through networking with local businesses who hire high school graduates or indirectly through organizing a career fair. Supplying links to practice test content and scheduling practice WorkKeys tests could help students improve their scores. Even taking WorkKeys once for practice would likely help students understand which areas they need to study and, at the very least, teach students how to better manage their time when taking the assessment. Integrating ACT® WorkKeys® National Career Readiness Certificate® (NCRC®) levels into school honor rolls would likely increase test motivation. These simple actions and others outlined in this report can help high schools develop more career-ready high school students.

Introduction

Many career and technical education (CTE) students in Alabama high schools take the ACT® WorkKeys® Applied Math, Workplace Documents, and Graphic Literacy Assessments to measure their foundational workplace skills. Moreover, students can earn an ACT® WorkKeys® National Career Readiness Certificate® (NCRC®), which certifies skills to potential employers and postsecondary training programs (ACT, 2014). Consequently, the Alabama State Department of Education (ALSDE) has partnered with ACT Research to share data and explore relationships between educational programs and the foundational workplace skills measured by WorkKeys.

This report focuses on Alabama high schools with greater-than-expected WorkKeys performance. That is, compared to other schools enrolling students with similar demographics and scores on the ACT® test, these schools exhibited higher average WorkKeys scores. Ten such schools were contacted to find out how they promote WorkKeys performance and career readiness more generally. The hope is that these schools can provide insights to other high schools in Alabama on increasing their WorkKeys scores.

Method

Statistical analyses estimated average WorkKeys performance, relative to expectations, for 351 high schools in Alabama (see Appendix for additional details). The result was not a simple ranking of schools in terms of WorkKeys performance. Rather, these analyses identified schools whose WorkKeys performance was particularly good compared to other schools with students having similar levels of academic achievement and similar demographics (e.g., gender, ethnicity). The ALSDE contacted 10 schools with greater-than-expected WorkKeys performance to ask the following questions:

1. Does your school have any special programs to help get students career ready?
2. How do your students prepare to take WorkKeys?
3. How do you communicate the value of taking WorkKeys and earning a WorkKeys NCRC?
4. Is WorkKeys recognized by local employers or postsecondary training programs?

An administrator, teacher, or counselor from six of the 10 schools (60% response rate) responded to the request and consented to be named in this report. The following Alabama high schools are represented:

- Booker T. Washington High School
- Clarke County High School
- Douglas High School

- Phil Campbell High School
- Ramsay High School
- Thomasville High School

Results

Career Readiness Programs

In terms of career readiness programming, the surveyed schools most often reported providing flexible initiatives wherein students can go beyond standard high school coursework to prepare for careers. Several schools mentioned co-op programs where students work part-time while still taking classes. Some schools also mentioned dual-credit opportunities at local universities and community colleges. Finally, two schools mentioned coursework through which students earn work-based certifications.

Another program, mentioned by two schools, was the Kuder Navigator program, which is an online education and career planning system. Several other career programs were mentioned at least once and are as follows:

- Smart Work training program
- Ready to Work program
- Jobs for Alabama Graduates (JAG)
- Future Teachers of Alabama (FTA)
- Future Business Leaders of Alabama (FBLA)
- Family, Career, and Community Leaders of Alabama (FCCLA)

The majority of respondents also mentioned conducting career fairs. The mention of career fairs cut across several of the survey questions, as career fairs serve multiple purposes related to career readiness (e.g., networking, communicating the value of WorkKeys, encouraging test-taking motivation, understanding how local employers do (or do not) use WorkKeys for hiring). Lastly, Douglas High School mentioned providing additional career services for students with disabilities, such as mock interviews, job shadowing, and internships.

Preparing for WorkKeys

Student performance on the WorkKeys Applied Math, Workplace Documents, and Graphic Literacy Assessments is reported using level scores that correspond to specific knowledge and skills required in a broad range of occupations. ACT® WorkKeys® Curriculum provides a placement exam, instructional modules, practice exercises, and quizzes to evaluate mastery of Applied Math, Workplace Documents, and Graphic Literacy at Levels 3, 4, 5, 6, and 7. Students who score at a level of 3 or higher on all three tests earn a Bronze NCRC.[1]

All the survey respondents mentioned using formal training materials such as WorkKeys Curriculum to help students prepare to take WorkKeys. ALSDE has set up an account with ACT where online WorkKeys Curriculum materials are available for any public high school in Alabama. Prior research indicates that even brief engagement with WorkKeys Curriculum is associated with higher WorkKeys scores (Steedle & Hawk, 2020). Additionally, all respondents dedicate regular class time to preparing students for the WorkKeys assessment. Several of the high schools use multiple class periods each week exclusively for WorkKeys test preparation. Two of the respondents administer multiple practice tests throughout the school year. Booker T. Washington High School uses the practice tests diagnostically to place students in study groups for customized instruction. Similarly, Thomasville High School uses ACT scores to place students into study groups.

The Value of WorkKeys

Students exhibit higher motivation on achievement tests when they understand the importance or value of an assessment. Schools reported many ways that they communicate the value of WorkKeys to their students. Here are a few examples:

- Booker T. Washington High School invites back college students and employed graduates to share their experiences and discuss the value of WorkKeys testing. Booker T. Washington also categorizes their honor roll using NCRC distinctions (i.e., Bronze, Silver, Gold, and Platinum).

- Clarke County High School provides students with a link to the ACT® Work Ready Communities website (https://www.workreadycommunities.org/), which lists local employers that recognize WorkKeys.

- As an incentive, Douglas High School offers exemption from all semester exams for any one semester for any student who passes all parts of WorkKeys (i.e., Applied Math, Graphic Literacy, and Workplace Documents).

- Teachers at Phil Campbell High School inform students about how employers use the WorkKeys NCRC to evaluate applicants who come directly from high school and those from college.

- Ramsay High School provides graduating seniors with certificates and honors recognition for their performance on WorkKeys, which is similar to Booker T. Washington.

- Thomasville High School communicates to students that over 350 of Alabama's employers use the WorkKeys NCRC as part of their hiring process.

WorkKeys Recognition

All survey respondents said that WorkKeys is recognized by local employers. Clarke County High School also mentioned that their local community college uses WorkKeys test scores for all of its technical programs. There were several other anecdotes from survey respondents that warrant mention:

- Booker T. Washington High School said that many students return after graduation to request a copy of their scores because local employers are offering jobs for applicants with certain scores.

- Clarke County High School mentioned that the Southwest Alabama Workforce Development Council is working to get all counties in the region recognized as ACT Work Ready Communities (https://www.workreadycommunities.org/).

- Phil Campbell High School works closely with local businesses to make students aware of qualifications required to gain employment.

Additional Resources

To learn more ways that high schools promote career readiness, please refer to a prior research study conducted with data from Arkansas high schools (Steedle & Girdler, 2020). High schools in Alabama, in Arkansas, and across the nation should have opportunities to learn from each other in pursuit of their shared goal of helping students achieve educational and workplace success.

Appendix: Statistical Analysis

Data

WorkKeys data for this study were extracted from the ACT WorkKeys examinee database, which includes records from Alabama high schools that tested during the 2018–2019 academic year. The WorkKeys examinee data were merged with ACT examinee data from spring 2018 statewide testing using name, date of birth, and zip code. Information about Alabama high school characteristics was gathered from publicly available data sets from the ALSDE website.

Analysis

High schools were included in analyses if they had 20 or more students with complete records (ACT scores, WorkKeys scores, ethnicity, and gender). This resulted in a sample of 44,337 students from 351 high schools. Descriptive statistics for students and schools were calculated for demographics and assessment scores. These data were used to fit a series of hierarchical linear models (with students nested in schools). Model fitting was repeated for each of the following combinations of assessments: ACT mathematics as a predictor of WorkKeys Applied Math, ACT reading as a predictor of WorkKeys Workplace Documents, and ACT science as a predictor of WorkKeys Graphic Literacy. Model 1 (shown below) is the unconditional model with no predictor variables. Model 2 adds student-level predictors (ACT score, non-White indicator, female indicator), and Model 3 adds school-level predictors (mean ACT, percentage non-White, percentage female, and percentage eligible for free or reduced-price lunch). Note that percentage eligible for free or reduced-price lunch was only known at the school level (not for individual students). Model 4 includes the predictors with consistently significant coefficients in Models 2 and 3 (for at least two of the three analyses). Finally, the school-level residuals were estimated based on Model 4 to

indicate WorkKeys performance relative to expected. The residuals were transformed to standard deviation units, and the school-level residuals from all three analyses were merged into a single data set. The average residual was calculated for each school, and the data were sorted to identify the schools with the highest average residuals.

Model 1

$$WK_{ij} = \beta_{0j} + r_{ij}$$

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

Model 2

$$WK_{ij} = \beta_{0j} + \beta_{1j}ACT_{ij} + \beta_{2j}NonWhite_{ij} + \beta_{3j}Female_{ij} + r_{ij}$$

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

Model 3

$$WK_{ij} = \beta_{0j} + \beta_{1j}ACT_{ij} + \beta_{2j}NonWhite_{ij} + \beta_{3j}Female_{ij} + r_{ij}$$

$$\beta_{0j} = \gamma_{00} + \gamma_{01}\overline{ACT_j} + \gamma_{02}Pct\_NonWhite_j + \gamma_{02}Pct\_Female_j + \gamma_{02}Pct\_FRPL_j + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

Model 4

$$WK_{ij} = \beta_{0j} + \beta_{1j}ACT_{ij} + \beta_{2j}NonWhite_{ij} + \beta_{3j}Female_{ij} + r_{ij}$$

$$\beta_{0j} = \gamma_{00} + \gamma_{01}\overline{ACT_j} + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

Results

Student Descriptive Statistics

The sample was 50.8% female, 30.7% Black, 55.4% White, and 6.2% Hispanic/Latino (Table 1). As shown in Table 2, mean ACT scores ranged from 17.8 (mathematics) to 18.7 (reading). The mean WorkKeys scale scores were 78.5 for Applied Math, 79.8 for Workplace Documents, and 79.3 for Graphic Literacy. WorkKeys performance is also reported by level scores ranging from 3 to 7. The mean WorkKeys scale scores corresponded to level scores of 4, 4, and 5, respectively. Note that scale scores (rather than level scores) were used in most analyses because they provide more fine-grained indicators of student achievement. By attaining certain level scores, students can earn a WorkKeys NCRC at the Bronze, Silver, Gold, or Platinum level. Of the Alabama high school students, 23.5% earned Bronze, 38.4% earned Silver, 17.2% earned Gold, and 12.5% earned Platinum (Table 1).

The distributions of ACT and WorkKeys scores are shown in the diagonal elements of Figure 1. The off-diagonal elements show scatter plots of ACT scores and WorkKeys scores and corresponding correlations, all of which were statistically significant ($p < .001$). The correlations between ACT scores (English, mathematics, reading, and science) and WorkKeys scores ranged from 0.61 to 0.76. The correlation between ACT mathematics and Applied Math was the strongest.

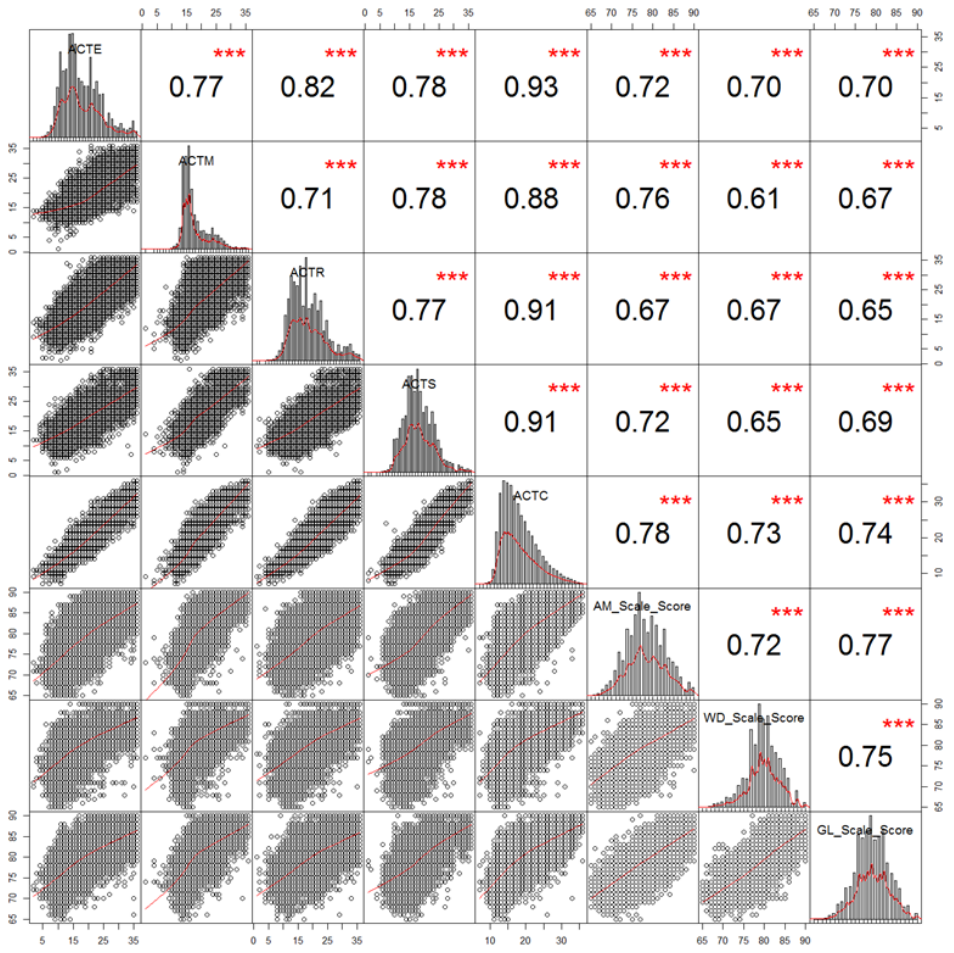
Table 1. Student Level Distributions of Gender, Ethnicity, and NCRC Level

Variable	Level	N	Percentage
Gender	Female	22,510	50.8%
	Male	21,827	49.2%
Ethnicity	Black/African American	13,591	30.7%
	American Indian/Alaska Native	354	0.8%
	White	24,547	55.4%
	Hispanic/Latino	2,765	6.2%
	Asian	620	1.4%
	Native Hawaiian/Other Pacific Islander	51	0.1%
	Two or more races	1,818	4.1%
	PNR/Missing	591	1.3%
NCRC level	Non-Qual.	3,697	8.3%
	Bronze	10,424	23.5%
	Silver	17,031	38.4%
	Gold	7,645	17.2%
	Platinum	5,540	12.5%
	Total sample size	44,337	

Table 2. Student Level ACT and WorkKeys Descriptive Statistics

Variable	Mean	SD	25th Percentile	Median	75th Percentile
ACT English	18.0	6.2	13	17	22
ACT mathematics	17.8	4.4	15	16	20
ACT reading	18.7	5.9	14	18	22
ACT science	18.4	5.0	15	18	22
ACT Composite	18.3	4.9	15	17	21
Applied Math	78.5	4.6	75	78	82
Workplace Documents	79.8	3.9	77	80	82
Graphic Literacy	79.3	4.0	77	79	82

Figure 1. Correlation Matrix of ACT and WorkKeys Assessment Scores



School Descriptive Statistics

Table 3 provides descriptive statistics for the distributions of demographic variables across schools. These variables include sample size, percentage female, percentage ethnicity, percentage eligible for free or reduced-price lunch (FRPL), percentage of

teachers with a master's degree, the overall college and career readiness (CCR) percentage, the percentage demonstrating CCR on the ACT, the percentage demonstrating CCR on WorkKeys, and the Alabama graduation rate. Table 4 summarizes the distributions of mean ACT and WorkKeys scores across the 351 Alabama high schools in the sample.

Table 3. School Level Characteristic Distributions

Variable	Mean	SD	25th Percentile	Median	75th Percentile
Sample size	126.3	102.7	54	93	160.5
Female	50.6%	6.1%	47.2%	50.4%	53.9%
Native American	0.9%	2.1%	0.0%	0.0%	1.0%
Asian	0.8%	2.1%	0.0%	0.0%	1.0%
Black/African American	29.4%	31.5%	3.8%	18.2%	46.2%
Hispanic/Latino	5.9%	7.0%	2.1%	4.1%	7.2%
Pacific Islander	0.1%	0.2%	0.0%	0.0%	0.0%
Two or more races	4.0%	3.0%	2.0%	3.6%	5.3%
White	57.7%	30.3%	37.9%	66.7%	81.8%
FRPL	51.7%	17.0%	41.2%	52.9%	62.8%
Master's degree	55.7%	6.5%	52.2%	55.8%	58.9%
Overall CCR	72.4%	14.8%	65.3%	74.7%	82.4%
ACT CCR	48.6%	16.6%	38.2%	49.1%	59.4%
WorkKeys CCR	55.7%	15.6%	48.0%	57.2%	66.0%
Alabama graduation rate	89.4%	5.0%	86.9%	90.3%	93.3%

Table 4. School Level ACT and WorkKeys Descriptive Statistics

Variable	Mean	SD	25th Percentile	Median	75th Percentile
ACT English	17.3	2.4	15.9	17.2	18.6
ACT mathematics	17.2	1.7	16.2	17.2	18.0
ACT reading	18.1	2.1	17.0	18.1	19.2
ACT science	17.8	1.9	16.6	17.7	18.9
ACT Composite	17.7	2.0	16.6	17.7	18.7
Applied Math	78.1	1.8	77.2	78.4	79.3
Workplace Documents	79.5	1.3	78.8	79.6	80.4
Graphic Literacy	79.1	1.4	78.2	79.2	80.0

Hierarchical Linear Modeling

A series of four hierarchical linear models were fit to the data to evaluate various predictors of WorkKeys scores. Model 1 is the unconditional model, which includes no predictor variables. Fitting the unconditional model provided estimates of the between-school variance (τ_{00}) and pooled within-school variance (σ^2). These values indicated that between 10.8% and 14.8% of the variance in WorkKeys scores was between schools (the intra-class correlation). Model 2 included several student-level predictors of WorkKeys scores: ACT score, non-White indicator, and female indicator. Depending on the subject area, the inclusion of these variables accounted for 78.1–86.6% of the between-school variance (see reduction in τ_{00}) and 41.1–53.0% of the pooled within-school variance (see reduction in σ^2). The coefficients for ACT score, non-White, and female were each statistically significant in Model 2 for all three assessments.

Model 3 added several school-level predictors: mean ACT score, percentage of non-White students, percentage of female students, and percentage of students eligible for free or reduced-price lunch (based on ALSDE statistics, not the sample). For each subject area, the inclusion of these variables accounted for a very small percentage of the remaining between-school variance. Of those predictors, only mean ACT was statistically significant for two of the three assessments, so all others were omitted in Model 4. Model 4 included ACT score, non-White indicator, and female indicator as student-level predictors and mean ACT score as a school-level predictor. To some extent, the non-White indicator variable likely served as a proxy for other (unmeasured) variables correlated with ethnicity (e.g., socioeconomic status, educational opportunity, school resources, etc.). Model 4 was treated as the final model. Model parameter estimates allowed for estimation of the school-level residual (u_{0j}), which indicated average WorkKeys performance relative to expected. Each school had three residuals (one for each WorkKeys assessment). Those residuals were averaged to identify schools with greater-than-expected WorkKeys scores.

Table 5. HLM Parameter Estimates

Outcome	Symbol	Description	Model 1	Model 2	Model 3	Model 4
Applied Math	γ_{00}	Intercept	78.155***	65.593***	64.619***	64.053***
	γ_{10}	Student-level ACT mathematics		0.759***	0.762***	0.757***
	γ_{20}	Student-level non-White		−1.094***	−1.021***	−1.083***
	γ_{30}	Student level female		−0.185***	−0.185***	−0.186***
	γ_{01}	School-level mean ACT mathematics			0.053	0.091***
	γ_{02}	School-level % non-White			−0.010***	
	γ_{03}	School-level % female			0.005	
	γ_{04}	School-level % FRPL			0.004	
	τ_{00}	School intercept variance	3.115	0.417	0.310	0.401
	σ_2	Student residual variance	17.911	8.414	8.411	8.413
Workplace Documents	γ_{00}	Intercept	79.563***	71.983***	68.696***	70.096***
	γ_{10}	Student-level ACT reading		0.420***	0.419***	0.418***
	γ_{20}	Student-level non-White		−0.485***	−0.459***	−0.460***
	γ_{30}	Student level female		0.370***	0.376***	0.372***
	γ_{01}	School-level mean ACT reading			0.158***	0.105***
	γ_{02}	School-level % non-White			0.001	
	γ_{03}	School-level % female			0.001	
	γ_{04}	School-level % FRPL			0.006*	
	τ_{00}	School intercept variance	1.630	0.349	0.296	0.305
	σ_2	Student residual variance	13.472	7.931	7.929	7.930

Table 5. HLM Parameter Estimates—continued

Outcome	Symbol	Description	Model 1	Model 2	Model 3	Model 4
Graphic Literacy	γ_{00}	Intercept	79.075***	69.918***	68.273***	68.578***
	γ_{10}	Student-level ACT science		0.522***	0.521***	0.520***
	γ_{20}	Student-level non-White		−0.592***	−0.565***	−0.579***
	γ_{30}	Student level female		0.216***	0.218***	0.216***
	γ_{01}	School-level mean ACT science			0.082*	0.076***
	γ_{02}	School-level % non-White			−0.003	
	γ_{03}	School-level % female			0.002	
	γ_{04}	School-level % FRPL			0.003	
	τ_{00}	School intercept variance	1.910	0.419	0.397	0.399
	σ_2	Student residual variance	13.950	7.933	7.922	7.933

Notes

1. Silver NCRC = score of 4 or higher on all three tests; Gold NCRC = score of 5 or higher on all three tests; Platinum NCRC = score of 6 or higher on all three tests.

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