

The ACT NCRC as an Indicator of Skills Needed for Success in Work-Based Learning and Industry-Specific Credentialing Programs

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GPS Education Partners is a community-based nonprofit organization and the only manufacturing-specific, statewide Department of Workforce Development Youth Apprenticeship Program in Wisconsin. During 1–2 years of study at GPS, students meet high school graduation requirements, receive industry-specific and job-specific training and technical certifications, and experience work-based learning through apprenticeships. This report describes a research collaboration between GPS and ACT that examined the relationships between ACT® WorkKeys® performance and outcomes for GPS students. Analyses revealed that WorkKeys correlated with academic outcomes like reading ability level and math course-taking patterns. WorkKeys was also related to Manufacturing Skill Standards Council (MSSC) Certified Production Technician (CPT) certificate attainment and course attendance. In all, WorkKeys appeared to provide useful signals of the foundational workplace skills required for success in a work-based learning program like GPS.

Sample and Descriptive Statistics

The sample analyzed in this study comprised 94 GPS students who graduated in spring 2018. The sample was predominantly male (91.5%), White (81.9%), and spent two years studying at GPS (72.3%). Table 1 provides descriptive statistics for several achievement variables including ACT WorkKeys—an assessment of foundational workplace skills taken by all high school juniors in the state of Wisconsin. GPS re-administers WorkKeys to their senior students prior to graduation, and all results reported here reflect testing during senior year (February–March 2018). WorkKeys scale scores, which range from 65–90, were transformed to the level scores shown in Figure 1. Students who achieved certain levels of WorkKeys performance in ACT® WorkKeys® Applied Math, Workplace Documents, and Graphic Literacy were awarded an ACT® WorkKeys® National Career Readiness Certificate® (NCRC®).¹ In the study sample, NCRC levels were distributed as follows: 28.7% Bronze, 33.0% Silver, 24.5% Gold, and 7.4% Platinum.

The average MSSC CPT exam scores in Table 1 all exceed the corresponding passing scores, which ranged from 73–76. GPS students had an average ACT Composite score of 16.3, and their average Lexile Level was 1155. For reference, the national average ACT Composite score was 20.8 for the 2018 graduating class,² and the typical Lexile range for 11th and 12th graders is 1130–1440.³ During their senior year, GPS students were absent from class an average of 8.3 days and absent from their apprenticeships an average of 4.3 days.

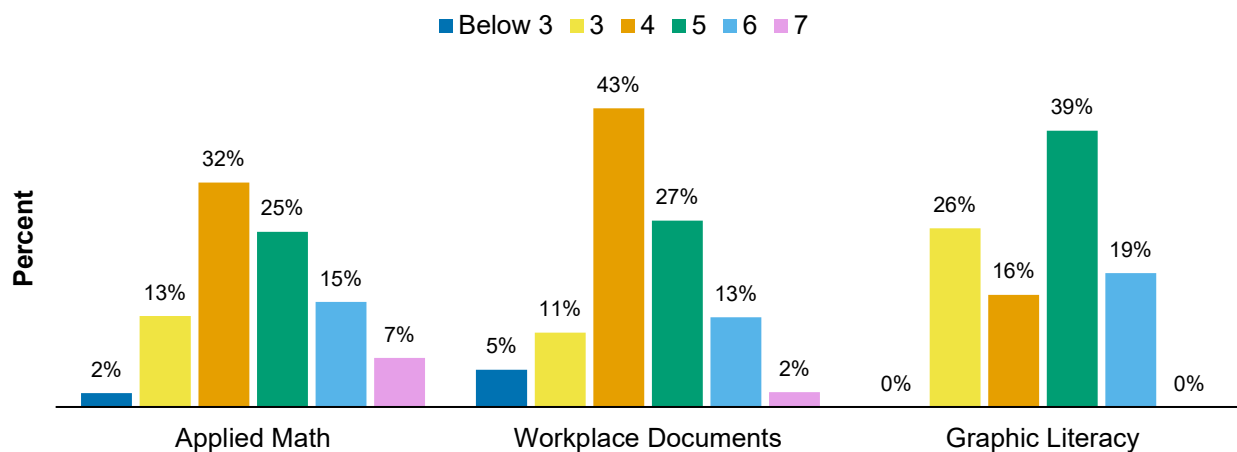


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Table 1. Descriptive Statistics

Variable	N	Mean	SD	25th Percentile	Median	75th Percentile
WorkKeys Applied Math	94	79.3	4.2	76.0	79.5	82.0
WorkKeys Workplace Documents	94	78.9	4.0	77.0	79.0	81.0
WorkKeys Graphic Literacy	94	78.3	3.3	75.3	78.0	81.0
CPT Safety	94	84.3	5.2	80.0	85.0	89.0
CPT Quality Practices & Measurement	91	82.7	5.2	79.0	82.0	86.0
CPT Manufacturing Processes & Production	66	81.4	5.7	76.0	80.0	86.0
CPT Maintenance Awareness	62	79.7	5.0	75.0	79.0	83.0
ACT Composite	85	16.3	3.5	14.0	16.0	18.0
Lexile Reading Ability Level	93	1155	229	990	1155	1330

Figure 1. Distributions of WorkKeys Level Scores



Academic Achievement

Achievement on WorkKeys should correlate positively with other indicators of achievement in similar content areas. For example, GPS students earning higher Workplace Documents level scores tended to have higher Lexile reading ability levels. Indeed, the correlation between Workplace Document scale scores and Lexile levels was .538 ($p < .001$), indicating a moderately strong, positive relationship. Moreover, GPS students with higher Applied Math level scores were more likely to take higher-level math courses during their senior year. Specifically, the percentage whose highest course was Technical Math (level 1A or 2), rather than Math for the Trades (level 1 or 2), increased from 0% to 35.4% to 46.8% to 63.6% as Applied Math level score increased from 3 to 6. Conversely, students whose highest course was Technical Math scored an average of 4.3 points higher on Applied Math than students whose highest course was Math for the Trades (a statistically significant difference of 1.2 standard deviations).

MSSC Certified Production Technician Attainment

As a credential for foundational workplace skills, the NCRC might serve as the base for a system of stackable credentials. That is, individuals who demonstrate foundational skills on WorkKeys should be more likely to succeed in industry-specific credentialing programs like the MSSC CPT. As shown in Table 2, WorkKeys had consistently positive correlations with the CPT exams, which indicated that students with higher WorkKeys scores tended to earn higher CPT exam scores. However, the correlation was not always statistically significant. Applied Math correlated significantly only with CPT Safety ($r = .24, p < .05$). Workplace Documents correlated significantly with CPT Safety ($r = .32, p < .05$) and CPT Manufacturing Processes & Production ($r = .33, p < .01$). Graphic Literacy correlated significantly only with CPT Safety ($r = .28, p < .01$). None of the WorkKeys Assessments correlated significantly with CPT Quality Practices & Measurement or CPT Maintenance Awareness. Note that high, positive correlations between WorkKeys and CPT exams were not necessarily to be expected, in part because the assessments measured very different constructs.

Table 2. Correlations between WorkKeys and CPT Exams

	Applied Math	Workplace Documents	Graphic Literacy
CPT Safety	.24*	.21*	.28**
CPT Quality Practices & Measurement	.06	.18	.03
CPT Manufacturing Processes & Production	.14	.33**	.14
CPT Maintenance Awareness	.09	.16	.11

* $p < .05$, ** $p < .01$, *** $p < .001$

Considering the small magnitude of the correlations in Table 2, strong associations between NCRC level and average CPT exam score were not expected. Indeed, the average CPT exam score tended to increase as NCRC level increased from Bronze to Platinum, but it did not increase consistently from one level to the next, especially for CPT Maintenance Awareness (Figure 2). Further analyses focused on the relationship between NCRC level and CPT pass rate for students who attended GPS for two years (most one-year students did not take all of the CPT exams). The pass rate for CPT Safety and CPT Quality Practices & Measurement were both 100%, so there could be no relationship between NCRC level and pass rate. The pass rates for CPT Manufacturing Processes & Production and CPT Maintenance Awareness were 86.8% and 77.9%, respectively. In both cases, a generally increasing pass rate trend was apparent (Figure 3). Overall, 82.4% of two-year students earned the CPT certification, and students earning higher NCRC levels were more likely to earn the CPT certification. In all, results indicate that students with higher NCRC levels were more likely to pass CPT exams and earn the certification, which is consistent with the notion that WorkKeys measures foundational skills that are important for success in industry-specific certification programs.

Figure 2. Average CPT Exam Score by NCRC Level

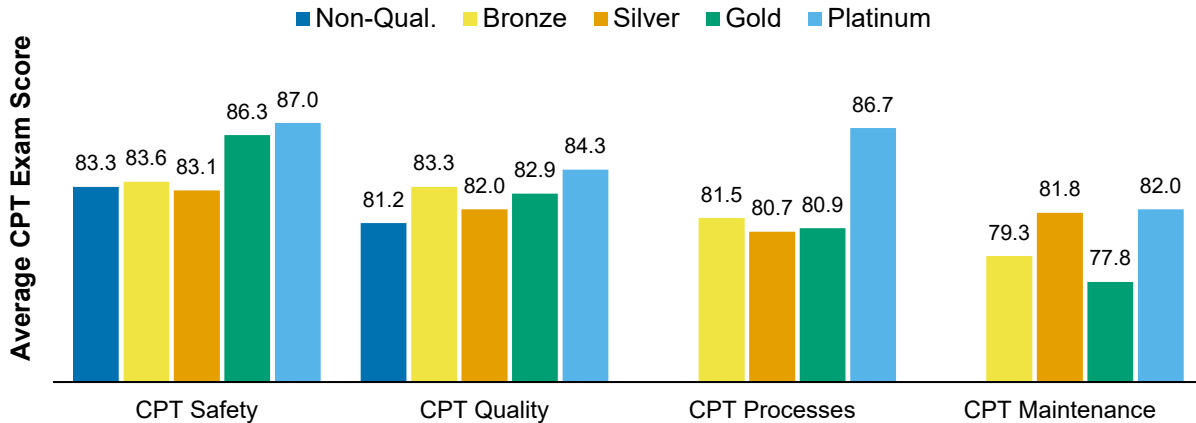
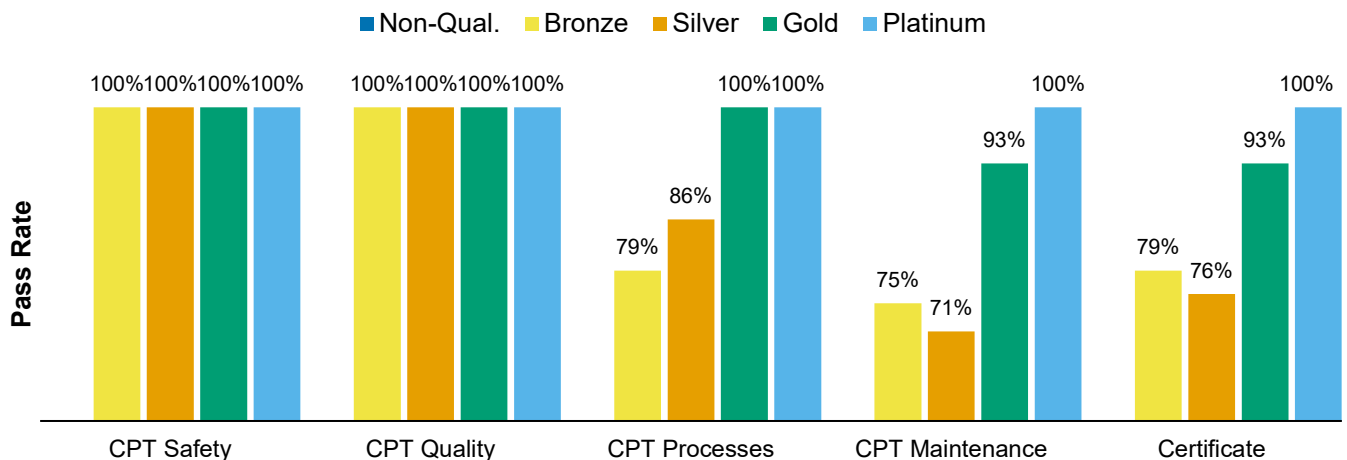


Figure 3. CPT Exam Pass Rate by NCRC Level



Note: Results for non-qualifiers were suppressed due to very small sample size (less than 5 students).

Additional Analyses

Results from several additional analyses are summarized here.

- WorkKeys performance had a small positive association with apprenticeship pay rate. However, pay rate was connected to passing CPT exams, so this relationship was expected considering the positive association between WorkKeys and CPT exam scores.
- Another analysis indicated that students who did not qualify for an NCRC had 5–8 more class absences on average. Otherwise, there was not a clear association between NCRC level and either class absences or work absences.
- A final analysis compared WorkKeys scores for students with different plans after graduation (e.g., manufacturing, military, etc.). The only notable trend was that the 13 students who entered full-time postsecondary studies had average WorkKeys scores that were 1–2 points higher than other students.

Conclusions

Through collaboration with GPS Education Partners, ACT Research analyzed GPS student data to examine the relationship between ACT WorkKeys and work-based learning outcomes. Students who performed better on WorkKeys Applied Math were more likely to take higher level math courses at GPS, and Workplace Document scores had a moderately strong association with Lexile reading ability levels. Students who performed better on WorkKeys tended to score higher on their MSSC CPT exams, and they were more likely to earn the CPT certification. Of the WorkKeys Assessments, Workplace Documents was the best predictor of MSSC CPT exam scores. In all, GPS students who performed well on WorkKeys were more likely to have positive academic and certification-related outcomes. Thus, results from the study are consistent with the notion that WorkKeys measures foundational workplace skills required for success in programs like GPS Education Partners, which offer work-based learning through apprenticeships.

Notes

1. ACT. (2014). *ACT National Career Readiness Certificate*. Iowa City, IA: ACT. Retrieved from <http://forms.act.org/certificate/pdf/NCRC-InformationFlyer.pdf>. Examinees must attain level 3 or higher on the three NCRC assessments to earn Bronze, 4 or higher to earn Silver, 5 or higher to earn Gold, and 6 or higher to earn Platinum.
2. ACT. (2018). *The condition of college and career readiness: National*. Iowa City, IA: ACT. Retrieved from <https://www.act.org/content/dam/act/unsecured/documents/cccr2018/National-CCCR-2018.pdf>
3. <https://lexile.com/parents-students/measuring-growth-lexile-measures/evaluating-performance-by-grade/>