Global Assessment Certificate Achievement as a Predictor of Meeting the ACT College Readiness Benchmarks

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The Global Assessment Certificate™ (GAC) program helps international students develop the academic knowledge, learning practices, and English language skills required to enroll at universities and earn a bachelor's degree (ACT, 2019). The GAC program includes three levels of instruction (Level I, Level II, and Level III), each entailing a combination of required and elective courses totaling 240 hours of classroom study plus 120 hours of independent study. Courses cover reading and writing skills, listening and speaking skills, mathematics, science, computing, business, social science, psychology, study skills, research skills, problem solving, team collaboration, oral presentation, and time management. Students who achieve passing grades at each level earn the Global Assessment Certificate, which supports enrollment at GAC Pathway Universities, including 75 in the United States (ACT, 2019). Most Pathway Universities offer GAC graduates up to one year of credit, which allows them to complete their degrees faster and with less expense.

This report describes research that evaluated GAC achievement as a predictor of ACT® assessment scores and meeting the ACT College Readiness Benchmarks. The ACT assessment is used to support college and university admissions decisions, and the ACT College Readiness Benchmarks are ACT scores associated with success in first-year, credit-bearing postsecondary courses (Allen, 2013).

Results from this study describe GAC student achievement on the ACT, illustrate how GAC grade point average (GPA) relates to ACT performance, and reveal the relationship between persistence through the GAC program and ACT scores. In general, GAC graduates performed well on the ACT compared to test-takers in the US. GAC grades were moderately strong predictors of ACT scores, which means that students who earned higher grades in GAC courses tended to earn higher scores on the ACT and were more likely to meet the ACT College Readiness Benchmarks. Moreover, students who completed higher levels of the GAC program tended to earn higher ACT scores. These findings are consistent with the notion that learning and achievement in the GAC program support academic preparedness for university studies.

Sample

GAC records were filtered to include only students who completed GAC Level III between 2014 and 2018. Those records included overall GPA and grades in GAC courses. To add ACT scores to the data set, GAC records were merged with ACT records using name and date of birth. ACT scores were found for 74.2% of the GAC graduates. Since this study was predictive in nature, students were included only if they took the ACT during or after their GAC Level III studies (96.8%). The final sample comprised

4,700 students who completed GAC Level III between 2014 and 2018. When multiple ACT scores were found, the record with the highest ACT Composite score was retained. GAC Level III lasted an average of eight months, and students took the ACT an average of four months before completing their GAC studies. Students were divided similarly between GAC completion years (21.9% in 2014, 19.7% in 2015, 21.8% in 2016, 19.4% in 2017, and 17.1% in 2018). The sample was 50.9% female and 49.1% male. Students were distributed geographically as follows: 79.2% China, 14.7% Mexico, 5.0% Southeast Asia (primarily Indonesia), and 1.1% other.

Measures

The data analyzed in this study included GAC GPAs and scores from the ACT assessment. Overall GAC GPA on a 0.0–4.0 scale reflected grades earned in all GAC courses taken in Levels I, II, and III. This study evaluated overall GAC GPA as a predictor of the ACT Composite score, which is the average of the English, math, reading, and science scores. Note that all ACT scores are reported on a 1–36 scale. Subsequent analyses examined the relationship between GAC grades in a content area and a related ACT score. For those analyses, three additional GAC GPAs were calculated. The GAC English language arts (ELA) GPA was based on grades in GAC academic English courses focusing on reading and writing skills. Grades in GAC mathematics courses were aggregated to calculate a GAC math GPA. Similarly, a GAC science GPA was based on grades in GAC science courses. In this study, the GAC ELA GPA predicted ACT English and ACT reading scores, the GAC math GPA predicted ACT math scores, and the GAC science GPA predicted ACT science scores.

This study also evaluated GAC GPAs as predictors of meeting the ACT College Readiness Benchmarks. Each Benchmark indicates the ACT score associated with a 50% chance of earning a B or higher grade in a related first-year, credit-bearing course at a typical two-year or four-year postsecondary institution in the US. For example, students earning a score of 18 on ACT English have a 50% chance of earning a B or higher grade in English Composition I. Likewise, the ACT Math Benchmark (22) is related to college Algebra grades, the ACT Reading Benchmark (22) is related to social science grades, and the ACT Science Benchmark (23) is related to biology grades. One study identified 23 as the ACT Composite score associated with a 50% chance of earning a 3.0 or higher first-year GPA (Allen & Radunzel, 2017).

Descriptive Statistics

Table 1 provides GAC GPA and ACT descriptive statistics. The study sample is shown in four separate groups based on the data available for each analysis. For example, the first analysis related overall GAC GPA to ACT Composite scores, and there were 4,700 students with both data values. Not all GAC students elected to take a science course, so there were only 4,222 students with both GAC science GPA and ACT science.

One trend apparent from Table 1 was that GAC GPAs were low compared to high school GPAs of typical university-bound students. Indeed, for students in this sample, the average self-reported high school GPA of 3.58 (based on ACT registration data) was substantially higher than the average overall GAC GPA of 2.48. GAC grading standards are known to be strict, and the average grade across GAC courses was 77.7%, which translated to a C+ grade or 2.3 GPA on the GAC grading scale. Considering this result, university admissions officers should account for GPA scale differences when reviewing GAC GPA and high school GPA. The lower section of Table 1 shows the distributions of GAC GPAs for the larger sample of GAC graduates (including those without ACT scores). The average GAC GPAs of the study sample were within 0.07 of the larger sample, suggesting that the study sample was representative of GAC graduates in terms of GAC grades.

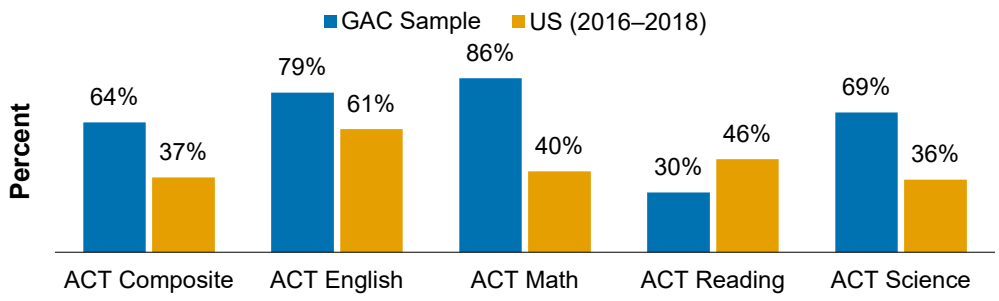
Table 1. GAC GPA and ACT Descriptive Statistics

Group	Variable	N	Mean	SD	25th %ile	Median	75th %ile
Study Sample	GAC Overall GPA	4,700	2.48	0.66	2.00	2.60	3.00
	ACT Composite	4,700	23.9	4.6	21.0	24.0	27.0
	GAC ELA GPA	4,695	2.16	0.69	1.63	2.10	2.63
	ACT English	4,695	21.9	5.4	19.0	22.0	26.0
	ACT Reading	4,695	19.2	4.9	16.0	19.0	22.0
	GAC Math GPA	4,688	2.63	0.86	1.97	2.73	3.33
	ACT Math	4,688	29.2	5.9	26.0	31.0	34.0
	GAC Science GPA	4,222	2.29	0.78	1.65	2.30	2.95
	ACT Science	4,222	25.1	5.3	22.0	25.0	29.0
All 2014–2018 GAC Level III Completers	GAC Overall GPA	9,485	2.45	0.66	2.00	2.30	3.00
	GAC ELA GPA	9,428	2.12	0.69	1.60	2.10	2.63
	GAC Math GPA	9,398	2.56	0.90	1.87	2.63	3.30
	GAC Science GPA	8,255	2.22	0.77	1.60	2.15	2.80

The average ACT Composite score for the sample was 23.9, which compared favorably to the US average of 20.9 based on the high school graduating classes of 2016, 2017, and 2018 (ACT, 2018). The higher average ACT Composite for GAC students was largely driven by higher average ACT math and ACT science scores. The GAC students averaged 29.2 and 25.1 on ACT math and ACT science, respectively. The respective averages on ACT English and ACT reading were 21.9 and 19.2. Overall, GAC students demonstrated relatively high achievement in math and science on the ACT compared to English and reading, which might be expected of non-native English speakers. For comparison, the US averages were 20.2 on ACT English, 20.6 on ACT math, 21.3 on ACT reading, and 20.8 on ACT science.

Figure 1 shows the percentages of GAC students who met the ACT College Readiness Benchmarks. Among US examinees, 37% met the ACT Composite Benchmark, 61% met the ACT English Benchmark, 40% met the ACT Math Benchmark, 46% met the ACT Reading Benchmark, and 36% met the ACT Science Benchmark. Compared to the reference group of US high school graduates, the GAC percentages were 27% higher for ACT Composite, 18% higher for ACT English, 46% higher for ACT math, and 33% higher for ACT science. In contrast, the percentage of GAC students meeting the ACT Reading Benchmark was 16% lower than the reference group.

Figure 1. Percentages Meeting ACT College Readiness Benchmarks



GAC GPA as a Predictor of ACT Scores

Associations between GAC GPAs and ACT scores were examined for this study. Analyses revealed the following statistically significant correlations: .47 between GAC overall GPA and ACT Composite, .47 between GAC ELA GPA and ACT English, .46 between GAC math GPA and ACT math, .43 between ACT ELA GPA and ACT reading, and .45 between GAC science GPA and ACT Science. Figure 2 illustrates these positive associations. Specifically, average ACT score increased consistently as GAC GPA increased.

Figure 3 shows the relationship between GAC GPA and the probability of meeting the ACT College Readiness Benchmarks. Consistent with the positive correlations between GAC GPA and ACT, the probability of meeting a given Benchmark increased as GAC GPA increased. Figure 3 is based on the logistic regression parameters reported in Table 2. From these parameters, it is possible to identify the GAC GPA associated with a .50 probability (50% chance) of meeting the corresponding ACT College Readiness Benchmark. These values are provided in the rightmost column of Table 2. For example, students with a GAC overall GPA of 1.91 had a 50% chance of earning an ACT Composite score of 23 or higher. The GPAs corresponding to .50 probabilities varied in accordance with GAC student performance on the ACT relative to the Benchmarks. Most GAC students (86%) met the ACT Math Benchmark; therefore, the GAC math GPA associated with a 50% chance of meeting the Benchmark was only 0.62. In contrast, a GAC ELA GPA of 3.00 was associated with a 50% chance of meeting the ACT Reading Benchmark, which was achieved by only 30% of the study sample.

Note: A .50 probability was used in these analyses to maximize classification consistency. That is, if GAC GPA was used to predict who would meet the corresponding ACT College Readiness Benchmark, the GPAs listed in Table 2 would provide the most accurate predictions.

Figure 2. Average ACT Score versus GAC GPA

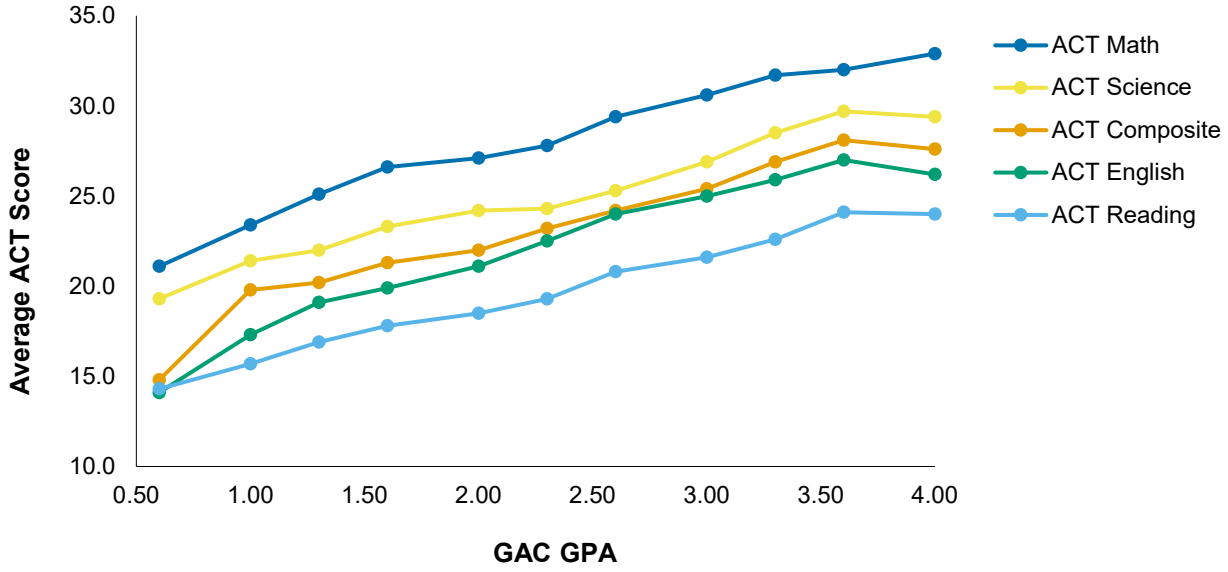


Figure 3. Probability of Meeting ACT College Readiness Benchmarks as a Function of GAC GPA

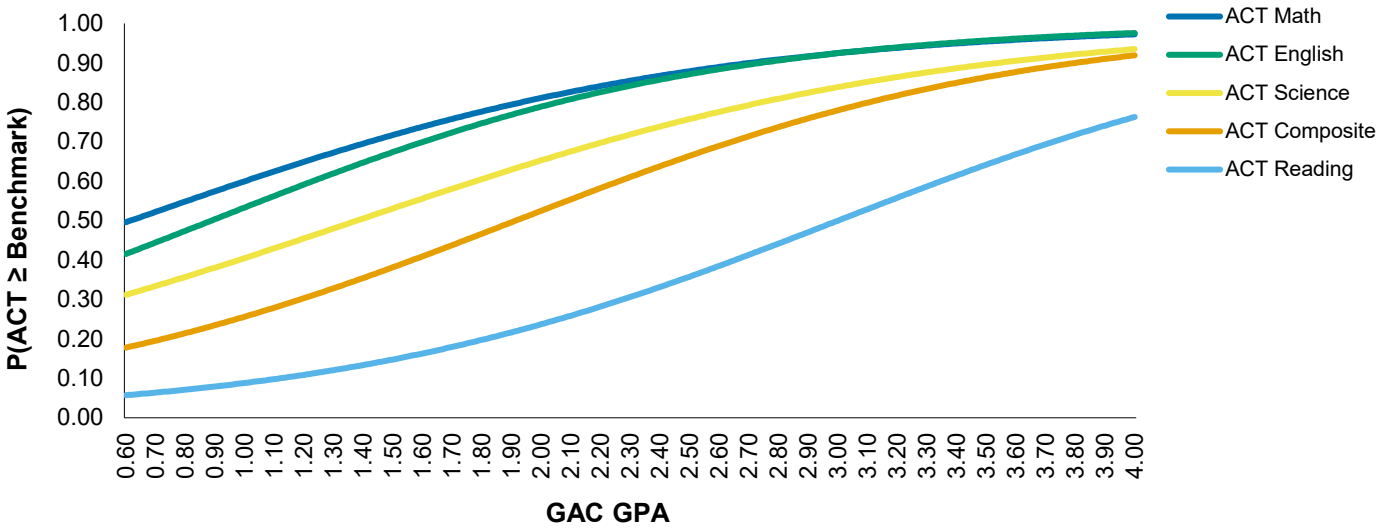


Table 2. Logistic Regression Coefficients and GAC GPA Associated with 50% Chance of Achieving the Benchmark

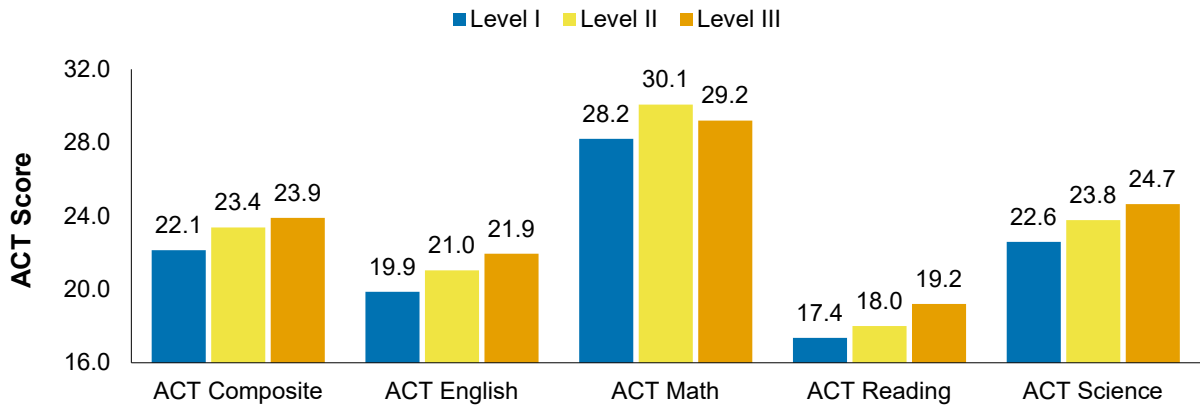
Predictor	ACT Score	College Readiness Benchmark	Logistic Regression		GAC GPA Associated with .50 Probability
			Intercept	Slope	
GAC Overall GPA	Composite	23	-2.23	1.17	1.91
GAC ELA GPA	English	18	-1.05	1.19	0.89
GAC Math GPA	Math	22	-0.65	1.05	0.62
GAC ELA GPA	Reading	22	-3.50	1.17	3.00
GAC Science GPA	Science	23	-1.40	1.02	1.38

GAC Persistence and ACT Scores

If the GAC program is effective for improving academic preparedness for university studies, then students who persist through the GAC program should perform better on the ACT. Analyses of GAC persistence included additional data from students who partially completed the GAC program. Of the GAC students who completed Level I between 2012 and 2016, 14.0% did not continue in the program, 24.8% stopped after completing Level II, and 61.3% completed Level III (as of 2018).

To see how GAC persistence related to average ACT scores, additional data were analyzed from a group of 2,624 students who began but did not complete the GAC program and who took the ACT. Figure 4 shows average ACT scores according to highest GAC level completed. The Level III results in Figure 4 reflect the same 4,700 students as the preceding analyses. Generally, students who completed higher levels of the GAC program earned higher average ACT scores. The only exception was ACT Math, which did not show a consistently increasing trend. In all other cases, the average differences between Level I and Level III and between Level II and Level III were statistically significant according to analysis of variance post hoc tests ($p < .001$). For ACT Composite, English, reading, and science, average differences between completing Level I and completing Level III ranged from 1.8 to 2.1 points on the 1–36 ACT scale. Those average differences each corresponded to an effect size of 0.38 standard deviations.

Figure 4. Average ACT Scores by Highest GAC Level Completed



Conclusions

The GAC program is designed to prepare students for success in university studies. This research evaluated that notion in three ways: by summarizing the performance of GAC graduates on the ACT assessment, by estimating the strength of the relationship between GAC grades and ACT scores, and by examining the relationship between GAC persistence and ACT scores. Compared to US high school graduates who took the ACT, GAC graduates performed relatively well on the ACT, especially in math and science. The only exception was that GAC graduates scored an average of 2.1 points lower on ACT reading than the US reference group. Likewise, a substantial percentage of GAC graduates met or exceeded the ACT College Readiness Benchmarks. Again, ACT reading was an exception, with only 30% of GAC graduates meeting the ACT Reading Benchmark. This finding likely reflected reading comprehension challenges associated with learning English.

With correlations ranging from .43 to .47, GAC GPAs exhibited a moderately strong relationship with ACT scores in a related content area. Likewise, logistic regression analyses revealed positive, statistically significant relationships between GAC GPA and the probability of meeting the ACT College Readiness Benchmarks. Finally, students who completed higher levels of the GAC program tended to earn higher ACT scores, which suggests that persistence through the GAC program could be related to higher levels of preparedness for university studies.

In all, findings support the notion that learning and achievement in the GAC program is associated with performance on the ACT assessment—an important factor in US college and university admissions decisions (Clinedinst & Koranteng, 2017). A substantial body of research supports the value of ACT scores as predictors of academic success at universities (ACT, 2017). Thus, achievement in the GAC program should reflect preparedness for university studies and predict academic success in university courses. However, ACT validity evidence and the ACT College Readiness Benchmarks are based primarily on data from native English speakers in the US. Thus, the conclusions of this study depend on the extent to which ACT scores and meeting the ACT College Readiness Benchmarks are useful predictors of university grades for international students whose native language is not English. Fortunately, this notion can be empirically evaluated, and several follow-up studies are planned to examine the relationship between GAC achievement and university outcomes such as enrollment, persistence, and degree attainment.

References

ACT. (2017). *The ACT technical manual.* Iowa City, IA: ACT. Retrieved from https://www.act.org/content/dam/act/unsecured/documents/ACT_Technical_Manual.pdf

ACT. (2018). *National distributions of cumulative percents for ACT test scores: ACT-tested high school graduates from 2016, 2017 and 2018* [table]. Retrieved from https://www.act.org/content/dam/act/unsecured/documents/MultipleChoiceStemComposite.pdf

ACT. (2019). *Global Assessment Certificate Program (GAC)* [website]. Retrieved from https://www.act.org/content/act/en/products-and-services/act-international-programs/global-assessment-certificate-programs.html

ACT. (2019). *Pathway Universities* [website]. Retrieved from https://www.act.org/content/act/en/products-and-services/act-international-programs/pathway-universities.html

Allen, J. (2013). *Updating the ACT College Readiness Benchmarks.* Iowa City, IA: ACT. Retrieved from https://www.act.org/content/dam/act/unsecured/documents/ACT_RR2013-6.pdf

Allen, J., & Radunzel, J. (2017). *Relating ACT Composite score to different levels of first-year college GPA.* Iowa City, IA: ACT. Retrieved from http://www.act.org/content/dam/act/unsecured/documents/R1645-act-composite-to-fygpa-2017-05.pdf

Clinedinst, M., & Koranteng, A. M. (2017). State of college admission. *Arlington, VA: National Association for College Admission Counseling.* Retrieved from https://www.nacacnet.org/globalassets/documents/publications/research/soca17final.pdf