TECHNICAL NOTES

Sampling and weighting

The sample design for the NAEP 2005 High School Transcript Study (HSTS) was designed to achieve a nationally representative sample of public and private high school graduates in the Class of 2005. For public schools, the HSTS sample was the twelfth-grade public school sample for the 2005 NAEP mathematics and science assessments; that is, the HSTS sample included every eligible sampled NAEP 2005 twelfth-grade public school that was contacted for the HSTS, whether or not they actually participated in the NAEP assessments. For private schools, the HSTS sample was a subsample from the NAEP 2005 twelfth-grade private school sample for the mathematics and science assessments. This subsampling process was carried out because private schools were oversampled in NAEP 2005. For HSTS, the sample design called for the private schools' sample size to be proportionate to their share of eligible students.

For NAEP-participating schools, only schools that assessed students in the main NAEP study mathematics or science tests were eligible for the HSTS. Within these schools, the HSTS used the same NAEP mathematics and science student samples. For schools that were selected for NAEP but did not participate, graduates were randomly selected. Approximately 94 percent of the HSTS sampled students were enrolled in schools that also participated in the NAEP assessments. Around 63 percent of the participating HSTS students also participated in the NAEP.

All estimates were weighted using sampling weights to provide unbiased estimates of the national population. Two types of HSTS weights, NAEP-linked weights and HSTS sample weights, were used in the analysis of these data. NAEP-linked weights were designed for analyses involving NAEP assessment scores or NAEP-based data such as student questionnaire data. These analyses only included transcripts from graduates who participated in a NAEP mathematics or science assessment. HSTS sample weights were designed for all aggregations that did not rely on NAEP-based data, and they encompassed all of the transcripts in the study.

School and student participation rates

To ensure unbiased samples, NCES established participation rate standards for national studies that must be met in order for the results to be reported without a nonresponse bias analysis. Participation rates for the original sample needed to be at least 85 percent for both schools and graduates. Although the weighted graduate within-school response rate was about 99.7 percent, the NAEP HSTS school response rate (84.2 percent) fell slightly below this NCES standard. A nonresponse bias analysis was conducted on public schools and private schools to determine whether the school characteristics from nonresponding schools showed significant differences from the responding schools. The characteristics that were analyzed in public schools included region, school location, grade enrollment, minority school (high/low), and percent minority for each of the races. The significant differences in public schools were found in region, school location, and percent minority. A similar analysis was conducted on private schools that included school type (i.e., Catholic, conservative Christian, Lutheran, nonreligious private, other private). Among private schools, significant differences were found in school type. Nonresponse weighting adjustments were used to correct for these differences among public and private schools. Although the differences found between respondents and nonrespondents are small for both public and private schools, it is unlikely that nonresponse weighting adjustments completely accounted for the differences.

Target population

The target population for HSTS 2005 included all students in public and private schools in the United States who were enrolled in twelfth grade in 2004–05 and who graduated in 2005. The HSTS collected a nationally representative sample of over 26,000 transcripts (from over 29,000 students in the sample), representing approximately 2.7 million 2005 high school graduates. The selected students excluded from the study included ineligibles, nongraduates, and students having incomplete transcripts. For each graduate, transcript information was collected for the ninth through the twelfth grade. Transcripts were collected from about 640 public schools and 80 private schools.

Analytical sample

To be consistent with previous published analyses of the NAEP HSTS data, almost all of the analyses presented in this report only included graduates with regular or honors diplomas. However, the analysis of the type of diplomas that graduates with disabilities received included those graduates who received special education diplomas or certificates of completion. Students who did not graduate or who had less than 3 years of transcript data were excluded from all of the analyses. The criteria for inclusion in the analyses in this report were established to ensure that the transcripts were complete and valid. They also restricted the analyses to those high school graduates with 16 or more earned Carnegie credits and a nonzero number of English Carnegie credits. Some of the analyses in the report focused on NAEP and high school achievement. These analyses were conducted on subsets of the sample. They were limited to the eligible graduates from the HSTS who had also participated in the NAEP assessments (approximately 17,000 of the graduates in the HSTS sample). Curriculum-level analyses, comparisons of seniors with underclassmen, and analyses of the highest mathematics and science courses completed by the course taken in the freshman year were limited to graduates with transcript data in all 4 years.

Variance estimation

Graduate estimates based on the HSTS were subject to sampling error because they were derived from a sample, rather than the whole population. Sampling error was measured by the sampling variance, which indicated how much the

population estimate for a given statistic was likely to change if it had been based on another equivalent sample of individuals drawn in exactly the same manner as the actual sample. Since the HSTS used a complex sample design with two-stage sampling and unequal selection probabilities, along with complex weighting procedures, standard textbook formulas could not be used for estimating variances. Instead, variances were estimated using jackknife replication methods (Krewski and Rao 1981). This estimation involved constructing a number of subsamples (replicates) from the full sample and computing the statistic of interest for each replicate. Measuring the variability among the replicates leads to an accurate estimate of variance for the full sample.

Interpreting statistical significance

Comparisons over time or between groups were based on statistical tests that considered both the size of the differences and the standard errors of the two statistics being compared. When an estimate—such as an average score—had a large standard error, a numerical difference that seemed large may not be statistically significant (i.e., a null hypothesis of no difference could not be rejected with sufficient confidence). Differences of the same size may or may not have been statistically significant for different comparisons depending on the size of standard errors involved. In the tables and charts of this report, the symbol (*) was used to indicate that a score or percentage in a previous assessment year was significantly different from the comparable measure in 2005 or to indicate that, within the current year, differences between groups (such as scores of White and Black graduates) were significantly different.

Any differences between scores or percentages discussed in this report are statistically significant at the 0.05 level. No adjustments are made for multiple comparisons.

Nonsampling error

As in any statistical study, the HSTS estimates are subject to nonsampling errors as well as sampling errors. For example, the appropriate CSSC code for classifying courses is not always clear because of insufficient or inaccurate information provided by schools leading to measurement error.

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