THE ROLE OF AGE AND GENDER IN THE STUDENTS' ACHIEVEMENT IN ENGLISH

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Abstract

The purpose of this study was to determine if age and gender influence on the students' achievement in high school English. This study utilized the student's grade point average (GPA) for English during high school years to measure achievement. The data for this study came from the National Assessment of Educational Progress (NAEP) High School Transcript Study (HSTS) 2005. The study described the graduating high school students in the U.S. by age, gender and their academic achievement in English. The study compared the English achievement between age groups and gender. The comparison revealed that there were statistically significant differences in GPA scores; however, the effect sizes were small. .

Index Terms- Achievement, Age, Assessment, English, Gender

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I. INTRODUCTION

There have been many studies conducted to determine the affect of several demographic variables on student achievement. This study looked specifically at age and gender. The results from prior studies about the effect of age on academic achievement are mixed. Coleman, Campbell, Hobson, McParland, Mood, Weinfield, York (1966) and White's (1982) studies showed that as students become older, the correlation between age and school achievement diminishes. According to White (1982) schools provide equalizing experiences, and thus the longer students stay in the schooling process, the more the impact of age on student achievement is diminished. In addition, as the students move up the age there would more students drop out of school, thus reducing the magnitude of the correlation.

On the other hand, results from longitudinal studies have contradicted White's results, by demonstrating that there is a gap in student achievements as students get older (Duncan, Brooks-Gunn, & Klebanov, 1994; Walker, Greenwood, Hart, & Carta, 1994), if not widen (Pungello, Kupersmidt, Burchinal, & Patterson, 1996).

Significant researches have indicated that gender plays a part in the student academic achievement. For example, researchers have found significant differences between male and female students in science achievement. In a meta-analysis of 77 studies conducted between 1980 and 1991 among middle and high school students, DeBaz (1994) found a significant gender effect favoring males in overall science achievement. In an analysis of data from the National Educational Longitudinal Study (NELS: 88), Lee & Burkam (1996) found a large advantage for males on the physical science subtest and a modest advantage for females on the life science subtest. Using data from the National Assessment of Educational Progress (NAEP) for students in grades seven and 11, Blosser (1990) concluded that male students were more likely than female students to report having attempted to fix electrical or mechanical devices. Conversely, females were more likely than males to have attempted diagnosing problems with an unhealthy plant or animal.

However, certain studies indicated that gender differences generally are small or non-existent. Hedges and Newell (1995) found that in science, boys outperform girls, but in reading and writing girls have the advantage. A study by Meece and Jones (1996) which examined the fifth-and sixth-grade students enrolled in a science class revealed that no gender differences in students' standardized test scores.

Coley (2001) studied gender differences within ethnic groups of varying ages and it revealed more similarities than differences. On most measures, gender differences did not vary much from one ethnic group to another. Coley's (2001) found that 1) females scored higher than males in reading and writing across all ethnic and age groups. This gap widened for most groups as the students progressed through school; 2) there was no gender gap for any group of 8th and 12th graders in math achievement; and 3) twelfth grade Hispanic females outscored like aged Hispanic males in social studies achievement. The other groups demonstrated no gender difference in social studies achievement.

II. PURPOSE AND OBJECTIVES OF THE STUDY

The purposes of this study were to describe and investigate the influence of age and gender on the students' achievement in English. The rationale for the study was to determine if age and gender contribute to the academic achievement of high school students in English. The results of the study attempted to provide evidence for the value of age and gender as predictors to students' achievement in English.

Specific objectives formulated to guide the researchers include: 1) To describe graduating high school students in the U.S by their age and gender. 2) To describe academic achievement of graduating high school students as measured by their English GPA scores. 3) To compare achievement, as measured by English GPA scores, of graduating high school students by their age and gender.

III. ACHIEVEMENT AND HIGH SCHOOL GPA

Measuring achievement is a significant part of the education process and informs educators of student ability and progress toward educational goals. It is also the primary gauge used by educators to guide the advancement of students through the education process (National Research Council, 1999). A substantial component of any education program is assessment, aimed at measuring student performance. A common measure the U.S high school students' academic achievement is the grade point average (GPA). High school subject GPA provides the status of student performance and provides documentation for course competency, mastery and gains. Their purpose is to indicate how effectively educational programs are meeting their goals for student learning. McEwen (2004) simplified that the results of assessments should indicate how effectively educational programs are achieving their goals for student learning. As such, they should inform the educator and should lead to improvements in the teaching/learning environment.

High school subject GPA is also important as predictors of performance at other levels of education (Kuncel, Credé, & Thomas, 2005). Two studies conducted during the 1960's were early evidence of the importance of high school grades as predictors of academic success. Irvine (1966), who conducted a five-year study of University of Georgia students, concluded that high school grade point average was the best single predictor of persistence. Ivey (1966) highlighted that high school rank was the most effective predictor of success in college. Although there has been considerable variability among studies with regard to the predictive value of variables that relate to college success, there is enough consistency to warrant that high school scholarship has been found to be the best single predictor of college success (Thomas & Stanley, 1969). Studies on high school GPA by Ramist (1984) and Willingham and Breland (1982) concluded that GPA is one of the best predictors of college grades. Based on these findings, this study used subjects' GPAs to determine the achievement of business education high school students

IV.   METHOD

a.   Population and Sample.

The target population for this study is all public and private high school students in the U.S. The frame for this study is defined as all students enrolled in public and private high schools in the U.S. All public and private high schools in the United States with one or more graduates in 2005 were eligible for HSTS 2005. The accessible population is defined as all graduating high school students enrolled in public and private high schools in the U.S in 2005 and had valid scores in the database of NAEP. The subjects for this study were the samples of the defined accessible population. Students with disability were eliminated from this study to have appropriate comparison groups in the event that one group of handicapped students enrolled in them that may skew results.

The National Assessment of Educational Progress (NAEP) High School Transcript Study (HSTS) 2005 consisted transcripts from about 640 public schools and 80 private schools. These transcripts constituted a nationally representative sample of 26,000 high school graduates, representing approximately 2.7 million 2005 high school graduates.

b. Instrumentation.

The instrument used for this research was a disc containing data sets from NAEP HSTS 2005. An Electronic Code Book (ECB); restricted-use data on high school courses; student and school demographics; and technical information for using, analyzing and interpreting the

data, are included on the CD-ROM. The variables of the investigation were copied directly from the data sets into SPSS. The variables transferred from this archival database were: age, gender, ethnicity, socio economic status as measured by highest parent educational status, private school student or public school student status, business education student or non-business education student status, and GPA in science.

c. Data Analyses.

Descriptive statistics were used to describe the data for objectives 1 and 2. Independent t-tests were used to conduct the analyses for objective 3. The alpha level was set a priori at .05. The effect sizes for the t-tests were interpreted according to Cohen's (1988) guidelines.

V.   FINDINGS AND DISCUSSION

A. Age and gender distribution.

Objective 1 was to describe the students' age and gender distribution.

a. Age.

The data available to compute age were the month and year of the respondents' birth and the month and year of respondents' graduated. Thus, the age measurements were computed to the nearest years by subtracting their birth dates from the date of their graduation. The mean age of the graduating students was 18.41 years of age. The youngest student was 15.75 years and the oldest was 28.5 years of age. For further analysis, the researcher divided the respondents into four age groups. These categories were selected by the researcher and included: 15 – 16 years, 17 – 18 years, 19 – 20 years, and 21years and above. Table 1 illustrates the data regarding the respondents' age distribution. The largest number of respondents were in the age group of 17 - 18 years (n = 21,951, 91.7%). The second largest group was the 19 - 20 age group, with (n = 1,460, 6.1%) of the respondents indicating their age in this group. The smallest number of respondents were in the age group of 21 years and above (n = 431, 1.8%).

Table 1. Description of age distribution for high school seniors for NAEP High School Transcript Study 2005 in the U.S.

Age Group in Years	Min	Max	Mean	Frequency	%
Student Age	15.75	28.5	18.41		
15 – 16				96	0.4
17 – 18				21,951	91.7

19 – 20		1,460	6.1
21 and above		431	1.8

Note. n = 23,938.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, NAEP High School Transcript Study 2005.

b. Gender.

There were (n = 12,591, 52.6%) females compared to (n = 11,347, 47.4%) males drawn from the samples. Table 2 illustrates the data regarding gender of the respondents.

Table 2. Description of gender distribution for high school seniors for NAEP High School Transcript Study 2005 in the U.S.

Gender	Frequency	%
Female	12,591	52.6
Male	11,347	47.4

Note. n = 23,938.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, NAEP High School Transcript Study 2005.

B. Academic achievement in English.

Objective 2 was to describe the academic achievement of graduating school students as measured by their English GPA scores. There were 23,933 valid English GPA scores in the data set. Table 3 illustrates the data regarding the achievement of all students on mathematics as measured by their GPA. The highest GPA score on English was 4.000.

Table 3. Description of Student Achievement Levels on English for graduating high schools students in 2005 in the U.S.

Achievement Level (GPA)	Min	Max	Mean	Frequency	%
GPA Score	0.560	4.000	2.856		
B or Better (3.000 – 4.000)				11,631	48.6
Between C and B (2.000 – 2.999)				9,454	39.5
Below C (0.000 – 1.999)				2,848	11.9

Note. n = 23,933.

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Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, NAEP High School Transcript Study 2005.

The lowest GPA score was 0.560. The mean GPA score of all students on English was 2.856. Students with GPA less than 2.000 accounted for (n = 2,848, 11.9%) of respondents. There were (n = 9,454, 39.5%) students who had GPA between 2.000 to 2.999 and (n = 11,631, 48.6%) students who had GPA 3.000 or greater.

C. Comparison of English GPA scores between age and gender groups.

The third objective was to compare mathematics achievement as measured by English GPA scores by students' age and gender. The researchers acknowledge that the numbers of students in groups based on age are not similar proportionately and that this is a limitation of this analysis. The comparisons utilized t-test procedures with an alpha level set a' priori at 0.05. Cohen's d was computed on scores that were statistically different to measure effect size and interpreted using Cohen's (1988) effect size descriptors for two independent groups.

a. Comparison of achievement based on age.

Table 4 illustrates the age groups were collapsed into two categories. There were (n = 22,047, 92.1%) students who were in the age group "below 19" and (n = 1,891, 7.9%) students were in the age group "19 and above".

Table 4. Age groups collapsed into two categories for high school seniors for NAEP High School Transcript Study 2005 in the U.S.

Age Group in Years	Frequency	%
Below 19	22,047	92.1
19 and above	1,891	7.9

Note. n = 23,938.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, NAEP High School Transcript Study 2005.

Comparisons for differences in the mean GPA scores in English and the variable age were made following collapse and recoding of the levels of age group into "Below 19" and "19 and above " categories. This maneuver was performed in an effort to reduce the danger of achieving spurious results after descriptive statistics revealed that the other age group categories "15.00 – 16.99" (n = 96, 0.4%) and "21 and above" (n = 431, 1.8%) had much lesser respondents as compared with "17.00 – 18.99" age group (n = 21,951, 91.7%).

Table 5. Comparison of mean GPA scores in English between age groups for high school seniors for NAEP High School Transcript Study 2005 in the U.S.

Subject	Below 19		19 and above		t	p > t	Cohen's d
	Mean (m)	SD	Mean (m)	SD			
English	2.886	0.721	2.503	0.709	16.47	<.001	0.53

Note. Below 19: n = 22,049; 19 and above: n = 1,891.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, NAEP High School Transcript Study 2005.

Table 5 illustrates that an independent t-test analysis revealed "Below 19" age group students had higher English GPA scores than the scores of "19 and above" age group students. "Below 19" students had a statistically significantly t-test (t = 16.47) for higher mean GPA score (m = 2.886) than "19 and above" age group students (m = 2.503). The statistical differences existed between the GPAs of "Below 19" students and "19 and above" students revealed an effect size Cohen's d (d = 0.53) which corresponds to moderate effect size.

b. Comparison of achievement based on gender.

Table 6 illustrates that an independent t-test analysis revealed female students had higher English GPA scores than the score of their male counterparts. Female students had a statistically significantly t-test (t = 36.71) for higher mean GPA score (m = 3.023) than male students (m = 2.670). The statistical differences existed between the GPAs of female students and male students revealed an effect size Cohen's d (d = 0.52) which corresponds to moderate effect size.

Table 6. Comparison of mean GPA scores in English between gender for high school seniors for NAEP High School Transcript Study 2005 in the U.S.

Subject	Female		Male		t	p > t	Cohen's d
	Mean (m)	SD	Mean (m)	SD			
English	3.023	0.683	2.670	0.731	36.71	<.001	0.52

Note. Female: n = 12,591; Male: n = 11,347.

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, NAEP High School Transcript Study 2005.

VI.   CONCLUSION

The majority graduating high school students in the U.S were between 17-18 years old and female. This is based on the finding that graduating high school students in 2005, the age of 91.7% of the students were between 17-18 years and the gender of 52.6% of the students were female.

Most graduating high school students had better than C grade in English. This conclusion is based on the finding that 21,085 (88.1%) students had GPA 2.000 and above. Conversely, 2,848 (11.9%) had lower than C grade or GPA less than 2.000.

"Below 19" age group students had higher GPA scores in English than the scores of "19 and above" age group students. This conclusion is based on the finding that the mean difference with statistical significance (t = 16.47, p <0.001) was found between the two groups and Cohen's d (d = 0.53) revealed a moderate effect size. This result is consistent with Coleman, et al. (1966) and White's (1982) studies, which showed that as students become older, the correlation between age and school achievement diminishes.

Female students had higher GPA scores in English than the scores of their male counterparts. This conclusion is based on the finding that the mean difference with statistical significance (t = 36.71, p <0.001) was found between the two groups and Cohen's d (d = 0.52) revealed a moderate effect size.

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