Executive Summary

Assessment of AP Participation and Academic Success at Texas A&M University

Prepared for the
Texas Center for Advanced Placement (AP) / International Baccalaureate (IB) Initiatives,
A Cooperative Partnership of the
Texas Education Agency and the Texas A&M University System

By the Center for Mathematics and Science Education
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October 2003
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Executive Summary

The purpose of this study was to assess Advanced Placement participation and academic success of students at Texas A&M University. The establishment of benchmark data regarding AP students in terms of selected characteristics and performance scores and the relationships and differences of these attributes to academic success at Texas A&M University was the focus of this research.

Specifically, three areas of inquiry were examined:

1. The extent of AP participation for Texas A&M University freshmen.
2. The extent of significant differences in characteristics and performance scores for students within the AP participation group.
3. The extent of significant differences in characteristics and performance scores for students who differed in terms of AP participation (AP vs. Non-AP).

Data for this study was obtained from the Student Information Management System of Texas A&M University for the school year 2001-2002. The population for this study was comprised of 6513 Texas A&M University freshmen. The obtained data was fractionated based on Advanced Placement course credit and resulted in two groups consisting of 3088 students who received some form of AP course credit and 3425 students who did not receive course credit by AP examinations. Only students with complete information in terms of fall and spring grade point ratios and full-time course loads of 12 or more class credits were utilized in this study. This resulted in a data set of 5896 participants. The AP group consisted of 2913 students while the Non-AP group contained 2983 students.

Eight performance scores were extracted from the obtained data set and utilized in the analyses. SAT, ACT, TASP, TASPW, TASP, FGPR, SPGPR, SSGPR (high school performance indicators that the students possessed before coming to Texas A&M University) and FGPR, SPGPR, SSGPR (university indicators of first year academic performance at Texas A&M University) comprised the 8 performance variables. Students were classified by 5 characteristic variables - group, gender, ethnicity, class size and class rank.

Highlights

- **AP Participation**
  
  Almost 50% of the freshmen for the Fall 2001-2002 had some form of AP credit.

- **AP Student Group**

  The most frequent form of AP credit was for English.
  
  Within AP English, students earning an AP score of 5 did academically better than students scoring a 4 and the students with the latter score outperformed students scoring a 3.
• **Relationships and Differences**
  
  **Relationships**
  
  Between Performance Variables
  
  *In the total sample, the degree of linear relationship for the performance variables was consistent. Measures of first year university academic success tended to group together and the indicators of high school academic ability tended to overlap with each other.*
  
  Between Characteristic and Performance Variables
  
  *The relationships between the characteristic variables and performance factors ranged from near zero to almost high. The higher degrees of association were observed for the variable of Group.*
  
  **Differences**
  
  **Group**
  
  *Based on the overall analyses conducted in this project, students at Texas A&M University who received AP credit academically outperformed Non-AP students. When AP and Non-AP students were classified in terms of SAT ability, the AP students still outperformed the Non-AP students.*
  
  **Gender**
  
  *Males exhibited significantly different means from females in terms of SAT scores, however, females outperformed their male counterparts in terms of grade point ratios attained during their first year at Texas A&M University.*
  
  **Ethnicity**
  
  *African American, American Indian and Hispanic students were underrepresented in this study. Their AP and high school performance scores were generally lower than the other ethnic categories.*
  
  **Class Size**
  
  *Students from larger class size environments comprised a greater portion of the AP Group than students from medium and small class sizes. Students from larger class sizes generally outperformed the other students. The students from medium and small class sizes exhibited equivalent performance scores.*
  
  **Class Rank**
  
  *In terms of indicators of high school and first year academic ability at Texas A&M University, students possessing better high school class ranks outscoed those with lower class rankings.*
Results Summary

- **AP Participation**
  
  *Almost 50% of the freshmen for the Fall 2001-2002 had some form of AP credit.*

Figure 1. Percentages in terms of Group

![Group Participation Pie Chart]

Participation in terms of Group and the other four characteristic variables are presented in Table 1.

<table>
<thead>
<tr>
<th>Characteristic Variable</th>
<th>Level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>AP</td>
<td>2913</td>
<td>49.4%</td>
</tr>
<tr>
<td></td>
<td>Non-AP</td>
<td>2983</td>
<td>50.6%</td>
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<td>Gender</td>
<td>Female</td>
<td>3084</td>
<td>52.3%</td>
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<tr>
<td></td>
<td>Male</td>
<td>2812</td>
<td>47.7%</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>African American</td>
<td>157</td>
<td>2.7%</td>
</tr>
<tr>
<td></td>
<td>Hispanic</td>
<td>611</td>
<td>10.4%</td>
</tr>
<tr>
<td></td>
<td>Native American</td>
<td>32</td>
<td>.5%</td>
</tr>
<tr>
<td></td>
<td>Asian/Pacific Islander</td>
<td>196</td>
<td>3.3%</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>4870</td>
<td>82.6%</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>30</td>
<td>.5%</td>
</tr>
<tr>
<td>Class Size</td>
<td>Small</td>
<td>1966</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>1969</td>
<td>33.4%</td>
</tr>
<tr>
<td></td>
<td>Large</td>
<td>1961</td>
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<td>1531</td>
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<tr>
<td></td>
<td>2nd Quartile</td>
<td>1428</td>
<td>24.2%</td>
</tr>
<tr>
<td></td>
<td>3rd Quartile</td>
<td>1456</td>
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<td></td>
<td>4th Quartile</td>
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<td>Level</td>
<td>Frequency</td>
<td>Percent</td>
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<td>-------------------------</td>
<td>-------</td>
<td>-----------</td>
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<tr>
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<td></td>
<td>Non-AP</td>
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<td>Non-AP</td>
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<td></td>
<td>Non-AP</td>
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<td></td>
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<tr>
<td>Medium</td>
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<td>Non-AP</td>
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<td></td>
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<td>AP</td>
<td>1092</td>
<td>33.3</td>
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<td></td>
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<td></td>
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<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; Quartile</td>
<td>AP</td>
<td>819</td>
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<tr>
<td></td>
<td>Non-AP</td>
<td>712</td>
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<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; Quartile</td>
<td>AP</td>
<td>726</td>
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<td>Non-AP</td>
<td>702</td>
<td></td>
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<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; Quartile</td>
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<td>714</td>
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<td></td>
<td>Non-AP</td>
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<td>4&lt;sup&gt;th&lt;/sup&gt; Quartile</td>
<td>AP</td>
<td>654</td>
<td>25.1</td>
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<tr>
<td></td>
<td>Non-AP</td>
<td>827</td>
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</table>
• **AP Student Group**

_The most frequent form of AP credit was for English. The frequencies for English and the other subject matter areas are given in Table 3._

Table 3. Frequencies for Extent of AP Course Credit

<table>
<thead>
<tr>
<th>Subject</th>
<th>Frequencies</th>
<th>Percent</th>
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<tbody>
<tr>
<td><strong>English</strong></td>
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</tr>
<tr>
<td>AP English Credit</td>
<td>1470</td>
<td>50.46</td>
</tr>
<tr>
<td>No AP English Credit</td>
<td>1443</td>
<td>49.54</td>
</tr>
<tr>
<td><strong>Mathematics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AP Math Credit</td>
<td>408</td>
<td>14.01</td>
</tr>
<tr>
<td>No AP Math Credit</td>
<td>2505</td>
<td>85.99</td>
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<tr>
<td><strong>Foreign Language</strong></td>
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<tr>
<td>AP Flng Credit</td>
<td>199</td>
<td>6.83</td>
</tr>
<tr>
<td>No AP Flng Credit</td>
<td>2714</td>
<td>93.17</td>
</tr>
<tr>
<td><strong>Chemistry</strong></td>
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<td></td>
</tr>
<tr>
<td>AP Chem Credit</td>
<td>157</td>
<td>5.39</td>
</tr>
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<td>No AP Chem Credit</td>
<td>2756</td>
<td>94.61</td>
</tr>
<tr>
<td><strong>Physics</strong></td>
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<td></td>
</tr>
<tr>
<td>AP Phys Credit</td>
<td>144</td>
<td>4.94</td>
</tr>
<tr>
<td>No AP Phys Credit</td>
<td>2769</td>
<td>95.06</td>
</tr>
<tr>
<td><strong>Biology</strong></td>
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</tr>
<tr>
<td>AP Biol Credit</td>
<td>136</td>
<td>4.67</td>
</tr>
<tr>
<td>No AP Biol Credit</td>
<td>2777</td>
<td>95.33</td>
</tr>
<tr>
<td>Other AP Credit</td>
<td>399</td>
<td>13.70</td>
</tr>
</tbody>
</table>

*Within AP English, students earning an AP score of 5 did academically better than students scoring a 4 and the students with the latter score outperformed students scoring a 3.* The frequencies and percents for AP English scores are presented in Table 4 and the university performances associated with the AP scores are given in Table 5.

Table 4. Summary of AP Scores in terms of English

<table>
<thead>
<tr>
<th>AP Score</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>759</td>
<td>51.6</td>
</tr>
<tr>
<td>4</td>
<td>535</td>
<td>36.4</td>
</tr>
<tr>
<td>5</td>
<td>176</td>
<td>12.0</td>
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</table>

Table 5. Means for AP English Categories for FGPR, SPGPR & SSGPR

<table>
<thead>
<tr>
<th>AP English Category</th>
<th>FGPR</th>
<th>SPGPR</th>
<th>SSGPR</th>
</tr>
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<tbody>
<tr>
<td>3</td>
<td>3.03</td>
<td>3.03</td>
<td>3.25</td>
</tr>
<tr>
<td>4</td>
<td>3.25</td>
<td>3.23</td>
<td>3.38</td>
</tr>
<tr>
<td>5</td>
<td>3.46</td>
<td>3.41</td>
<td>3.62</td>
</tr>
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</table>

There were significant differences in the means for FGPR and SPGPR presented in Table 5.
• **Relationships and Differences**

**Relationships**

Between Performance Variables

*In the total sample, the degree of linear relationship for the performance variables was consistent. Measures of first year university academic success tended to group together and the indicators of high school academic ability tended to overlap with each other.*

Table 6.
Total Group Correlation* Matrix

<table>
<thead>
<tr>
<th></th>
<th>FGPR</th>
<th>SPGPR</th>
<th>SSGPR</th>
<th>SAT</th>
<th>ACT</th>
<th>TASPR</th>
<th>TASPW</th>
<th>TASPIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>FGPR</td>
<td>1.000</td>
<td>.526</td>
<td>.305</td>
<td>.060</td>
<td>.002</td>
<td>.046</td>
<td>-.088</td>
<td>.081</td>
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<tr>
<td>SPGPR</td>
<td>1.000</td>
<td>.741</td>
<td>.364</td>
<td>.654</td>
<td>.524</td>
<td>.508</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSGPR</td>
<td>1.000</td>
<td></td>
<td>.364</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACT</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TASPR</td>
<td>1.000</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>TASPW</td>
<td>1.000</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TASPIM</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The closer to 1.00 the higher degree of relationship between two variables.

**Between Characteristic and Performance Variables**

*The relationships between the characteristic variables and performance variables ranged from near zero to high. The higher degrees of association were observed for the variable of Group.*

**Differences**

The means for all of the performance variables in terms of Group and Group by Characteristic Variables are summarized in Table 7.
Table 7. Means for SAT, ACT, TASPR***, TASPW, TASPM, FGPR, SPGPR, & SSGPR*** for 2001-02 Freshmen at Texas A&M University

<table>
<thead>
<tr>
<th>Characteristic Variable</th>
<th>TAMU SAT</th>
<th>TAMU ACT</th>
<th>Texas (1999-00)* SAT</th>
<th>TAMU ACT</th>
<th>TASPR</th>
<th>TASPW</th>
<th>TASPM</th>
<th>FGPR</th>
<th>SGPR</th>
<th>SSGPR</th>
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<tbody>
<tr>
<td>All (n=5896)</td>
<td>1166.92</td>
<td>24.89</td>
<td>990</td>
<td>20.3</td>
<td>258.02</td>
<td>240.80</td>
<td>257.93</td>
<td>2.83</td>
<td>2.84</td>
<td>3.06</td>
</tr>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AP (n= 2913)</td>
<td>1218.20</td>
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<td>260.31</td>
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<td>2.99</td>
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<td>257.16</td>
<td>2.66</td>
<td>2.69</td>
<td>2.88</td>
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(Table 7. continued)

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<th>Texas (1999-00)*</th>
<th>TAMU</th>
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<td>SAT</td>
<td>ACT</td>
<td>SAT</td>
</tr>
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<tr>
<td>Small (n=1966)</td>
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<td>Large (n=1961)</td>
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<td></td>
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<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; Quartile (n=1428)</td>
<td>1146.08</td>
<td>24.49</td>
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<td>257.08</td>
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<td>255.68</td>
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<td>3&lt;sup&gt;rd&lt;/sup&gt; Quartile (n=1456)</td>
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<td>24.34</td>
<td>257.12</td>
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<td>Non-AP</td>
<td>1101.12</td>
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<td>256.04</td>
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<td>4&lt;sup&gt;th&lt;/sup&gt; Quartile (n=1481)</td>
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<tr>
<td>Non-AP</td>
<td>1129.99</td>
<td>23.56</td>
<td>257.05</td>
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</tbody>
</table>

*Results of College Admissions Testing in Texas for 1999-2000 Graduating Seniors
**Mexican American and other Hispanic
*** TASP and SSGPR data are based on smaller sample sizes because of exemptions or non-participation.
Group

Based on the overall analyses conducted in this project, students at Texas A&M University who received AP credit academically outperformed students in the Non-AP Group.

Table 8.
Group Means for High School and University Performance Variables for 2001-02 Freshmen at Texas A&M University

<table>
<thead>
<tr>
<th>Group</th>
<th>SAT</th>
<th>ACT</th>
<th>TASPR</th>
<th>TASPW</th>
<th>TASPW</th>
<th>FGPR</th>
<th>SPGPR</th>
<th>SSGPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP (n= 2913)</td>
<td>1218.20</td>
<td>26.21</td>
<td>260.31</td>
<td>241.98</td>
<td>260.01</td>
<td>2.99</td>
<td>2.99</td>
<td>3.25</td>
</tr>
<tr>
<td>Non-AP (n= 2983)</td>
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<td>23.71</td>
<td>257.16</td>
<td>240.36</td>
<td>257.16</td>
<td>2.66</td>
<td>2.69</td>
<td>2.88</td>
</tr>
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</table>

Figure 2. Means for SAT and ACT for Group

Figure 3. Means for FGPR and SPGPR for Group
When AP and Non-AP students were classified in terms of SAT ability, the AP students still outperformed the Non-AP students.

AP and Non-AP students were categorized into two groups, those meeting and exceeding a benchmark score of 1110 and those scoring below the benchmark score of 1110. The means for the SAT Categories are given in Table 9 and presented graphically in Figures 5-8.

Table 9. Means for Group by SAT Categories

<table>
<thead>
<tr>
<th>Performance Score</th>
<th>Group</th>
<th>SAT Category</th>
<th>Below benchmark</th>
<th>Met benchmark</th>
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</thead>
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<td>FGPR</td>
<td>AP</td>
<td>2.62 (n=721)</td>
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</tr>
<tr>
<td></td>
<td>Non-AP</td>
<td>2.53 (n=1598)</td>
<td>2.81 (n=1385)</td>
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<td>SPGPR</td>
<td>AP</td>
<td>2.70 (n=721)</td>
<td>3.08 (n=2192)</td>
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<tr>
<td></td>
<td>Non-AP</td>
<td>2.59 (n=1598)</td>
<td>2.81 (n=1385)</td>
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<tr>
<td>SSGPR</td>
<td>AP</td>
<td>3.08 (n=83)</td>
<td>3.30 (n=246)</td>
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</tr>
<tr>
<td></td>
<td>Non-AP</td>
<td>2.78 (n=199)</td>
<td>3.01 (n=164)</td>
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Figure 5. Means for FGPR and SPGPR for Group by SAT Categories
Figure 6. Means for SSGPR for Group by SAT Categories

Figure 7 indicates that for those students who met the SAT benchmark, AP students outperformed No AP students. Within those students who did not meet the benchmark (Figure 8) AP students also outperformed No AP students.

Figure 7. Means for FGPR and SPGPR for Group at Met Benchmark

Figure 8. Means for FGPR and SPGPR for Group at Below Benchmark
Gender

Males exhibited significantly different means from females in terms of SAT scores, however, females outperformed their male counterparts in terms of grade point ratios attained during their first year at Texas A&M University.

Table 10.
Gender Means for High School and University Performance Variables for 2001-02 Freshmen at Texas A&M University

<table>
<thead>
<tr>
<th>Gender</th>
<th>SAT</th>
<th>ACT</th>
<th>TASPR</th>
<th>TASPW</th>
<th>TASPM</th>
<th>FGPR</th>
<th>SPGPR</th>
<th>SSGPR</th>
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<tr>
<td>Female (n= 3084)</td>
<td>1140.92</td>
<td>24.75</td>
<td>257.24</td>
<td>242.55</td>
<td>255.86</td>
<td>2.85</td>
<td>2.90</td>
<td>3.11</td>
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<tr>
<td>Male (n= 2812)</td>
<td>1195.35</td>
<td>25.06</td>
<td>258.93</td>
<td>238.71</td>
<td>260.44</td>
<td>2.80</td>
<td>2.77</td>
<td>3.00</td>
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Figure 9. Means for SAT and TASPW for Gender

Figure 10. Means for FGPR and SPGPR for Gender
Ethnicity

African American, American Indian and Hispanic students were underrepresented in this study. Their performance scores were generally lower than the other ethnic categories.

Table 11. Ethnicity Means for High School and University Performance Variables for 2001-02 Freshmen at Texas A&M University

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>SAT</th>
<th>ACT</th>
<th>TASPR</th>
<th>TASPW</th>
<th>TASPIM</th>
<th>FGPR</th>
<th>SPGPR</th>
<th>SSGPR</th>
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<td>255.20</td>
<td>236.29</td>
<td>254.63</td>
<td>2.58</td>
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<td>3.07</td>
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<td>266.33</td>
<td>240.00</td>
<td>244.67</td>
<td>2.90</td>
<td>2.74</td>
<td>3.17</td>
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<tr>
<td>Asian/Pacific Island</td>
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<td>25.19</td>
<td>248.37</td>
<td>230.00</td>
<td>274.30</td>
<td>2.91</td>
<td>2.81</td>
<td>3.06</td>
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<td>1177.78</td>
<td>25.25</td>
<td>259.67</td>
<td>243.24</td>
<td>259.72</td>
<td>2.86</td>
<td>2.86</td>
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<td>224.67</td>
<td>3.00</td>
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</table>

Figure 11. Means for SAT and ACT for Ethnicity
Figure 12. Means for TASPR and TASPW for Ethnicity

- Ethnicity: African American, Hispanic, Native American, Asian/Pacific Island, White, Other
- Mean TASPR: 248, 253, 266, 248, 253, 266
- Mean TASPW: 253, 255, 260, 253, 253, 260

Figure 13. Means for TASPM and FGPR for Ethnicity

- Ethnicity: African American, Hispanic, Native American, Asian/Pacific Island, White, Other
- Mean TASPM: 248, 255, 260, 274, 243, 254
- Mean FGPR: 3.10, 3.00, 2.91, 2.90, 2.58, 2.54

Figure 14. Means for SPGPR and SSGPR for Ethnicity

- Ethnicity: African American, Hispanic, Native American, Asian/Pacific Island, White, Other
- Mean SPGPR: 2.57, 2.69, 2.74, 2.81, 2.65, 2.56
- Mean SSGPR: 3.40, 3.20, 3.06, 3.17, 3.06, 3.07
Class Size
Students from larger class size environments comprised a greater portion of the AP Group than students from medium and small class sizes. Students from larger class sizes generally outperformed the other students. The students from medium and small class sizes exhibited equivalent performance scores.

Table 12. Class Size Means for High School and University Performance Variables for 2001-02 Freshmen at Texas A&M University

<table>
<thead>
<tr>
<th>Class Size</th>
<th>SAT</th>
<th>ACT</th>
<th>TASPR</th>
<th>TASPW</th>
<th>TASPM</th>
<th>FGPR</th>
<th>SPGPR</th>
<th>SSGPR</th>
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<td>Small (n=1966)</td>
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<td>257.01</td>
<td>240.81</td>
<td>255.54</td>
<td>2.77</td>
<td>2.80</td>
<td>3.02</td>
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<tr>
<td>Medium (n=1969)</td>
<td>1152.75</td>
<td>24.51</td>
<td>259.01</td>
<td>240.63</td>
<td>257.30</td>
<td>2.77</td>
<td>2.78</td>
<td>3.07</td>
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<td>Large (n=1961)</td>
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<td>257.96</td>
<td>241.07</td>
<td>262.66</td>
<td>2.93</td>
<td>2.94</td>
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Figure 15. Means for SAT and ACT for Class Size
Figure 16. Means for TASPM and FGPR for Class Size

![Graph showing means for TASPM and FGPR across class size categories.]

Figure 17. Means for SPGPR for Class Size

![Graph showing means for SPGPR across class size categories.]

Class Rank

In terms of indicators of high school and first year academic ability at Texas A&M University, students possessing better high school class ranks outscored those with lower class rankings.

Table 13.
Class Rank Means for High School and University Performance Variables for 2001-02 Freshmen at Texas A&M University

<table>
<thead>
<tr>
<th>Class Rank</th>
<th>SAT</th>
<th>ACT</th>
<th>TASPR</th>
<th>TASPW</th>
<th>TASPM</th>
<th>FGPR</th>
<th>SPGPR</th>
<th>SSGPR</th>
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<td>(n=1456)</td>
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<td>257.12</td>
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<td>259.32</td>
<td>2.75</td>
<td>2.78</td>
<td>2.91</td>
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<td>1169.19</td>
<td>24.57</td>
<td>258.64</td>
<td>240.15</td>
<td>258.33</td>
<td>2.65</td>
<td>2.64</td>
<td>2.87</td>
</tr>
</tbody>
</table>

Figure 18. Means for SAT and ACT for Class Rank
Figure 19. Means for FGPR and SPGPR for Class Rank

Figure 20. Means for SSGPR for Class Rank