Teaching Methods at Single Sex High Schools

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Educ 400: Senior Research Project
Educational Studies Program
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Background

- Attended an all-girls high school
- Brother attended an all-boys high school
- Psychology Major
Literature

• Research states that boys and girls have biological differences in the brain:
Boys

- Decreased lateralization (less communication between hemispheres)
- Smaller frontal lobes (increased impulsiveness)
- Less sensitive sensory receptors
- Increased Testosterone (spatial tasks; aggressive and kinesthetic propensity)
Girls

- Increased lateralization
- Better developed left hemisphere
- Larger Hippocampus (memorization ability)
- More sensitive sensory receptors
- Decreased Testosterone
Seen in Brain Scans:

Figure 1:

Figure 2:
Research shows that because of these biological differences, boy’s and girl’s ideal learning environment is different:

<table>
<thead>
<tr>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Competition-based</td>
<td>- Language reasoning</td>
</tr>
<tr>
<td>- Vibrant/Fast interaction</td>
<td>- Collaboration (group discussion)</td>
</tr>
<tr>
<td>- Short-term targets</td>
<td>- Challenge (not competition)</td>
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<tr>
<td>- Spatial mechanical manipulation</td>
<td>- Warm, soft environment fostered by teacher</td>
</tr>
<tr>
<td>- Kinesthetic (movement; learning by doing)</td>
<td>- Memorization tasks</td>
</tr>
<tr>
<td>- Slight criticism from teacher</td>
<td></td>
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</tbody>
</table>
Research Question:

How closely are teaching methods at single sex high schools correlated with the cognitive differences between each sex?
Method

• Electronic survey administered to full-time teaching faculty at 2 all girls and 1 all boys boarding high schools
• A total of 58 people completed the survey
  - 28 girl’s school, 30 boy’s school
• Survey asked teachers to rate the frequency with which they used certain teaching methods
• Teaching methods were then analyzed with a t-test analysis of means
Teaching Methods Measured

- Volume of Voice
- Visual Aids
- Media
- Language and Comprehension based instruction
- Handouts
- Kinetic Learning
- Experiential Learning
- Socratic Method

- Structure
- Collaboration
- One-on-one
- Peer Instruction
- Multiple Stimuli
- Competition and Peer Grading
- Formality
- Association with real world
- Rote memorization
Results

• The frequency rating used was a 5-point scale, where 1 = often (daily), 3 = sometimes (once a month), and 5 = never

• Two of the 17 measures were significant, but each in the opposite direction predicted:
  - Formality: $t (54) = 2.568, p = .013$
  - Memorization: $t (54) = -3.506, p = .001$

• The hypothesis that teaching methods would correlate with sex differences was refuted on two levels:
  1) Lack of significance
  2) If significant, opposite predicted direction
Teacher Comments

• Open-ended questions
• Comments paralleled prediction:

<table>
<thead>
<tr>
<th>Boys School Teachers</th>
<th>Girls School Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>“unpredictable and fast-moving”</td>
<td>Use of Socratic Method</td>
</tr>
<tr>
<td>“authoritative”</td>
<td>Group work and collaboration</td>
</tr>
<tr>
<td>Relation to life experience (sports)</td>
<td>“Gentle”</td>
</tr>
<tr>
<td>Critique</td>
<td>“Encouraging”</td>
</tr>
</tbody>
</table>

• Disparity between open ended self report and categorized self report is not unique to this study (IBSC Teaching Boys Study, 2009)
Analysis

• Quantitative measures were insignificant
• Qualitative measures paralleled previous research (IBSC, 2009)
• Insignificance may be due to:
  1) Sample size (approaching significance)
  2) School demographic
• Participation in seminars?
Conclusion

• Trends can be identified that support teaching methods conducive to cognitive differences and learning styles
• No significant conclusions can be made about the significance of teaching methods in single-sex classrooms
References