

**GOALS and STRATEGIES**

**Goals**
- Improve Student Success
- Improve Teaching and Learning for 1st year STEM Courses

**Challenges**
- No common first-year curriculum among 16 undergraduate programs (other than technical writing, calculus, and general chemistry)
- Low historical Retention Rates (average over 2000—04)
  - 2nd Year Retention Rates = 58.7% to STEM
  - 3rd Year Retention Rates = 40.5% to STEM
  - 4th Year Retention Rates = 32.6% to STEM
- Diverse academic background of entering 1st-time, 1st year CEAS students as demonstrated by 1st semester Math Placement

**Strategies**
- Placed 278 students into learning communities in 2005-06, 314 students in 2006-07, and 359 students in 2007-08, and 457 in 2008-09
- Learning Communities: place ~20 students in the same 3-to-5 courses together to promote connection and study groups
- Learning Communities based on majors (Civil and Construction Engineering, Electrical and Computer Engineering, Chemical/Paper, Undecided) or math placement (calculus, pre-calculus, algebra)
- Chemical Engineering: Tech. Communication, Chemistry I, Intro. to Chemical Engr., Math (Calculus, Pre-Calculus)
- Electrical and Computer Engineering: Tech. Communication, Digital Logic, Chemistry I, Math (Calculus, Pre-Calculus)
- Undecided: Tech. Communication, Intro to Design, Math (Calculus, Pre-Calculus, Algebra II), and Chemistry (Calc/Pre-Calc)

**RESULTS**

- Building Connections: % of Positive Responses to FYEE Components - (Agree or Strongly Agree)

<table>
<thead>
<tr>
<th>Item</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know at least 6 other LC students</td>
<td>87</td>
<td>78</td>
<td>79</td>
<td>71</td>
</tr>
<tr>
<td>I have studied with other LC students</td>
<td>74</td>
<td>63</td>
<td>73</td>
<td>59</td>
</tr>
<tr>
<td>I know where to get tutoring for core classes</td>
<td>54</td>
<td>54</td>
<td>70</td>
<td>62</td>
</tr>
<tr>
<td>I have used a tutor for one or more core classes</td>
<td>32</td>
<td>44</td>
<td>31</td>
<td>25</td>
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</tbody>
</table>

- Higher Successful Completion Rates of critical 1st year STEM courses (grade =/>C) - statistically significant at α = 0.05
  - Calculus I (Science/Engineering) - Fall 06; Calculus I (General) - Spring 06, Fall 06, Fall 07
  - Pre-Calculus - Fall 05, Spring 06, Fall 06, Fall 07
  - Algebra II - Fall 06, Fall 07
  - Chemistry I - Fall 05, Fall 06, Fall 07
  - Physics I - Spring 07, Spring 08
  - Technical Communication - Fall 06, Fall 07
  - Engineering Graphics - Fall 05, Fall 06

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<tr>
<td>Retention to STEM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005-06 Cohort</td>
<td>68.0</td>
<td>60.0</td>
<td>54.3</td>
<td>40.6</td>
</tr>
<tr>
<td>2006-07 Cohort</td>
<td>70.1</td>
<td>60.0</td>
<td>54.5</td>
<td>42.3</td>
</tr>
<tr>
<td>2007-08 Cohort</td>
<td>66.3</td>
<td>58.7</td>
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**2nd Year, 3rd, and 4th Year Retention Rates**

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<td>FYEE Comparison</td>
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- **2004-05 average, 2007-08 CSRDE WMU-STEM Retention Survey, WMU Office of Student Academic and Institutional Research**
- **2000-03 average of combined 4-year graduation and continuation to 5th year, 2007-08 CSRDE WMU-STEM Retention Survey, WMU Office of Student Academic and Institutional Research**

**IMPACT and CHALLENGES**

**Institutional Policy**
- Increased collaboration between academics and student life and Vice President of Student Affairs joined the STEP Advisory Board
- STEP In-semester Progress Report success has led to the adoption of University-wide mid-term grade reporting policy
- Students allowing parental access to academic records allows STEP-PI to enlist the parents’ assistance to support student success
- CEAS Task Force created to improve learning in critical engineering science courses - pilot program in Statics implemented in all 2008 shows 10% improvement in students who successfully completed course
- Tutoring Center name changes to “Student Success Center” to reduce stigma
- WMU is a partner of a multi-institutional effort to improve mathematics education for engineering students - funded by NSF-CCLI Phase 3 project

**Continuing Work**
- Faculty Protocol to engage Residence Life to check on students who miss successive classes will be revised based on feedback from pilot program in Fall 2008; revised protocol will be implemented in Fall 2009 in a course with large enrollment
- Build relations with departments to create customized learning communities
- Implement Supplemental Instruction in critical engineering science gateway courses
- Raise awareness among faculty about the Millennial students and faculty role in student success
- Address critical engineering science classes to improve 3rd year retention