Academic and Student Affairs Collaboration to Enhance Student Success in Engineering and Applied Sciences

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Overview

• Background of WMU-CEAS
• Collaboration between Academic & Student Affairs
  ➢ Why
  ➢ How
• Preliminary Results
• Lessons Learned
Western Michigan University is a comprehensive university located in Kalamazoo, MI

Carnegie classification - doctoral research intensive

Classified as “Moderately Selective” in CSRDE

WMU Fall 2009 enrollment: 19,547 undergraduate and 5,029 graduate students

CEAS Fall 2009 enrollment: 2,091 undergraduate & 288 graduate students

CEAS offers 16 bachelor, 10 master, & five doctoral programs

Nine engineering, three engineering technology, and one computer science programs accredited by ABET
First-time first-year CEAS students come from diverse academic preparation backgrounds.

<table>
<thead>
<tr>
<th>1st Semester Math</th>
<th>2005(%)</th>
<th>2006(%)</th>
<th>2007(%)</th>
<th>2008(%)</th>
<th>2009(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculus II and higher</td>
<td>9.7</td>
<td>5.4</td>
<td>5.1</td>
<td>5.2</td>
<td>8.4</td>
</tr>
<tr>
<td>Calculus I</td>
<td>31.5</td>
<td>35.3</td>
<td>42.7</td>
<td>39.2</td>
<td>34.0</td>
</tr>
<tr>
<td>Pre-Calculus</td>
<td>24.9</td>
<td>31.0</td>
<td>31.1</td>
<td>29.8</td>
<td>27.6</td>
</tr>
<tr>
<td>Algebra II</td>
<td>23.4</td>
<td>17.7</td>
<td>13.7</td>
<td>18.9</td>
<td>22.0</td>
</tr>
<tr>
<td>Algebra I and lower*</td>
<td>10.5</td>
<td>10.6</td>
<td>7.5</td>
<td>6.9</td>
<td>8.0</td>
</tr>
</tbody>
</table>

*Includes students not taking any math in 1st semester*
WMU-CEAS

- Implemented learning community project in 2005 with support from NSF-STEP

<table>
<thead>
<tr>
<th>CSDRE¹</th>
<th>WMU Baseline²</th>
<th>Retention</th>
<th>2005 (262)</th>
<th>2006 (303)</th>
<th>2007 (306)</th>
<th>2008 (354)</th>
</tr>
</thead>
<tbody>
<tr>
<td>69</td>
<td>60.0</td>
<td>2ⁿ Year (%)</td>
<td>68.0</td>
<td>70.1</td>
<td>66.3</td>
<td>67.5</td>
</tr>
<tr>
<td>53</td>
<td>40.6</td>
<td>3ʳ Year (%)</td>
<td>54.3</td>
<td>52.8</td>
<td>52.0</td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td>33</td>
<td>4ᵗ Year (%)</td>
<td>44.5</td>
<td>48.8⁵</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40.7³</td>
<td>32</td>
<td>5ᵗ Year (%)</td>
<td>44.6⁴</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹For all institutions, 2005-06
²Averaged 2000-2004
³37.4% graduated in a STEM field in 6 years + 3.3% continued in 7ᵗ year
⁴35.1% continued in 5ᵗ year + 9.5% graduated with CEAS degrees
⁵48.8% returned to CEAS in Year 4 + 2 graduated with CEAS degrees
Academic & Student Affairs Collaboration

• Why?
  ➢ Students spend a significant amount of time outside the classroom
  ➢ Student’s cognitive and affective development are intertwined ➢ attitudes and values strongly influence behavior of learning
  ➢ Faculty can leverage the expertise of student affairs professionals to impact student’s affective development
Academic & Student Affairs Collaboration

• Why?
  ➢ Opportunities arose in 2006 in creation of special interest housing by Residence Life
  ➢ Engineering House grew from 41 first-time first-year CEAS students in 2006 to 171 in 2009
Academic & Student Affairs Collaboration

• How?

Barriers to academic & student affairs collaboration
  ➢ Differences in background and training
  ➢ Differences in language, culture, and theoretical bases
  ➢ Habit of isolation
  ➢ Differences in organizational structure, goals, priorities
  ➢ Poor communication and lack of mutual understanding
  ➢ Rare between STEM and student affairs

Academic & Student Affairs Collaboration

• How?

The Continuum of Collaborative Process

<table>
<thead>
<tr>
<th>Informing</th>
<th>Communication</th>
<th>Cooperation</th>
<th>Collaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g. sent e-mail re. dates of events, changes of policies, etc.</td>
<td>face-to-face meeting to share information but lack in-depth discussion, problem solving, or joint decision making</td>
<td>share info/resources to complete task, but emphasize getting along rather than tackle difficult issues</td>
<td></td>
</tr>
</tbody>
</table>

Academic & Student Affairs Collaboration

• How?

True Collaboration involves

- Understand each other’s culture, language, and organization characteristics and philosophical and programmatic approaches
- Mutually construct the vision, goals, and processes for student development
- Identify the roles of faculty and student affairs staff; and opportunities for collaboration
- Joint planning, implementation, and accountability; share resources

Some Examples and Preliminary Results

• 2008 Pilot: Faculty Protocol to Engage Residence Life when a student missed consecutive classes
• Nine CEAS faculty members made 21 referrals involving 17 students
• A majority of CEAS faculty felt intervention led to change in student attitude
• CEAS and Residence Life reviewed pilot to assess timeliness, responsiveness, and connecting student to appropriate campus services
• Revised tracking form for 2\textsuperscript{nd} implementation in Fall 2009
Some Examples and Preliminary Results

- Establish Engineering House survey procedure
- Early indicator of value-added by Engineering House: upward trend in student responses to survey

<table>
<thead>
<tr>
<th>Survey Item</th>
<th>2007 mean (n = 67)</th>
<th>2009 mean (n = 130)</th>
<th>t statistics</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>The general atmosphere is open and welcome</td>
<td>3.88</td>
<td>4.29</td>
<td>3.19</td>
<td>0.002</td>
</tr>
<tr>
<td>I often study with others who live in the house</td>
<td>3.42</td>
<td>3.75</td>
<td>1.73</td>
<td>0.084</td>
</tr>
<tr>
<td>I usually prefer to study alone</td>
<td>3.76</td>
<td>3.41</td>
<td>2.14</td>
<td>0.034</td>
</tr>
</tbody>
</table>

Scale: 1 = strongly disagree; 5 = strongly agree
Some Examples and Preliminary Results

• Embed assessment in RA programming
• RA’s submitted online retrospectives describing promotion, number in attendance, impression of program effectiveness toward objective, and recommendation for continuous improvement
• Results communicated to CEAS
CEAS Collaborate with Other Units in WMU

- Collaborate with Fall Welcome
- From communicating in 2008 to collaborating in 2009
- Two events in 2009:
  - Academic Etiquette
  - Explore CEAS
CEAS Collaborate with Other Units in WMU

- Academic Etiquette: Communication Strategies for Success
- 177 students participated to learn verbal and non-verbal communication
- Assignment: Write e-mail to introduce self to IME 1020 instructor
- Assessment:
  - 65 e-mail received by first day of class (38.4% participation)
  - 72.3% received perfect score (applied lessons learned)
  - “It helped me learn to communicate with professors.”
CEAS Collaborate with Other Units in WMU

- Explore CEAS: students given a “passport”
- Objective: become familiar with building, people, and programs
- 246 students participated
- Assessment (Scale: 1 = not at all; 5 = very much)
  - Familiar with building: 4.5
  - Faculty and staff helpful: 4.7
  - Learn out programs: 4.4
  - Find classroom and lab: 4.1
  - “I didn’t know what type of Engineering that I would like to be. The program helps me out a lot.”
  - “It got me more familiar with Parkview and its professors.”
Lessons Learned

• Relationship building takes time, effort, and patience
• CEAS has a better understanding of Residence Life, and vice versa (rhythm of semester, strengths, boundaries)
• Share and even champion other for resources
Acknowledgment

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