Minutes of March 9, 2011 CEAS-STEP Advisory Board Meeting

***Present*:**

Advisory Board Members: Tim Greene (Chair), Diane Anderson, Tony Vizzini, Bill Cobern, Len Ginsberg, Paul Engelmann, Ekk Sinn

STEP Project Team: Edmund Tsang, Laura Darrah, Ikhlas Abdel-Qader, Cynthia Halderson, Carey Schoolmaster, and Anetra Grice.

Briefing Report

I. Performance (GPA) in First-Year STEM Courses for Fall 2011 Cohort

Courses	**STEP**	**Comparison**
CHEM 1100 (General Chemistry I)	**2.54**	2.27
MATH 1230 (Calculus II)	**2.81**	1.65
MATH 1220 (Calculus I)	2.70	1.93
MATH 1700 (Calculus I)	2.05	1.74
MATH 1180 (Pre-Calculus)	1.94	1.81
MATH 1110 (Algebra II)	1.86	1.50
MATH 1100 (Algebra I)	1.77	**2.28**
IME 1020 (Technical Communication)	2.60	2.45
IME 1420 (Engineering Graphics)	**3.02**	2.77

Bold means statistically significant at $\alpha = 0.05$

In addition, national and WMU data shows living on campus has a positive impact on student grades. Since 2006, the average Fall Semester GPA of CEAS students living in Engineering House/ Bigelow Hall is higher when compared to non-EH/Bigelow CEAS students. For Fall Semester 2007 and 2010, the increase was statistically significant for all populations: CEAS first-year students as defined by Banner and all CEAS students living in resident halls. The 2010 results correspond to the launching of the Engineering Peer Mentor program in EH/Bigelow Hall, and the EPM program could be a contributing factor.

Average Fall Semester GPA Comparisons of all First-Year CEAS Students

	Fall 2006		**Fall 2007**		**Fall 2008**		**Fall 2009**		**Fall 2010**	
	Students	**GPA**	**Students**	**GPA**	**Students**	**GPA**	**Students**	**GPA**	**Students**	**GPA**
EH/Bigelow	88	2.69	146	2.79*	179	2.75	176	2.79	173	2.62*
Non-EH/Bigelow	295	2.64	187	2.48	267	2.71	195	2.61	250	2.38
All	383	2.65	333	2.61	446	2.73	371	2.70	424	2.48

* Difference is statistically significant at $\propto \leq 0.05$

Average Fall Semester GPA Comparisons of all On-Campus CEAS Students

	Fall 2006		Fall 2007		Fall 2008		Fall 2009		Fall 2010	
	Students	GPA	Students	GPA	Students	GPA	Students	GPA	Students	GPA
EH/Bigelow	101	2.74	170	2.82*	213	2.75	226	2.79	226	2.68*
Non-EH/Bigelow	425	2.70	298	2.62	389	2.74	364	2.67	401	2.46
All	526	2.54	468	2.71	602	2.69	590	2.74	627	2.72

* Difference is statistically significant at $\propto \leq 0.05$

II. Baseline Retention/Graduation of Prior STEP Cohorts (2005-2009)

			2005 Cohort 262 students	2006 Cohort 303 students	2007 Cohort 306 students	2008 Cohort 349 students	2009 Cohort 315 students
% MATH ACT =/< 23			30.4	28.0	20.9	24.8	29.6
CSRDE[1]	WMU Baseline[2]	Retention to CEAS					
69%	57.4%	2nd Year	68.0%	70.1%	66.3%	67.5%	66.0
53%	42.3%	3rd Year	54.3%	52.8%	52.0%	52.1%	
NA	32.7%	4th Year	44.5%	48.8%[6]	43.3%		
NA	32.8%[4]	5th Year	44.6%[5]	45.0%[8]			
40.7%[3]	32.3%[4]	6th Year	41.6%[7]				

[1] Data is for all institutions (Highly Selective, Selective, Moderately Selective, Less Selective) as reported in the 2005-06 Consortium for Student Retention Data Exchange (CSRDE). WMU is a "Moderately Selective" institution. 2nd year retention and 6th-year graduation rate for "Moderately Selective" institution is 62% and 24%, respectively.
[2] CSRDE STEM Retention Survey, WMU Office of Student Academic & Institutional Research, data averaged 2000-05.
[3] 37.4% graduated in a STEM field in 6 years with another 3.3% returned the 7th year for a combined 40.7%.
[4] WMU Office of Student Academic & Institutional Research, data averaged 2000-03 [2].
[5] 9.5% of the 2005 Cohort has graduated with CEAS degrees and 35.1% are continuing in the 5th year for a combined 44.6%.
[6] 48.8% returned to CEAS, plus another 2 students from this cohort have graduated with CEAS degrees.
[7] 14.9% continued in CEAS in 6th year + 26.7% graduated with CEAS degree for a combined 41.6%.
[8] 32.4% continued in CEAS in Year 5 + 12.6% graduated with CEAS degrees for a combined 45.0%

III. Fall Survey of 2010 Cohort – Highlights and History

Prepared by Cynthia Halderson, Science and Mathematics Program Improvement (SAMPI), Mallinson Institute for Science Education, March 2011

As part of the external evaluation of the STEP Learning Community collaboration program, funded by the National Science Foundation, participating students were surveyed in late fall 2010 about their first-semester experiences in the university and the program. In total, 371 students were placed into 18 learning communities. Completed surveys were received from 297 students, an 80% response rate. Highlights from the Fall Survey results follow.

Respondent Description

Students were asked to identify gender, residence, first-generation college status, and whether and how many hours they worked. Summary information follows.

Table 1. Student Characteristics

Female	First-Generation	Engineering House	Employed
28 9%	65 22%	117 39%	59 20%

- The percent of female respondents was the same as in the first-year student population.
- The percent of first-generation college students has declined from a high of 28% in 2005.
- Male students were somewhat more likely than women to be first-generation college students – 23% compared to 14% – but the difference was not statistically significant.
- A slightly higher percentage of female students than males live in Engineering House – 46% to 39%.
- There was no statistically significant difference in the ACT Math scores of Engineering House residents as compared to those in other residence halls.
- Female students were statistically significantly more likely to be employed (57%) than male students (16%). Mean weekly hours of work were comparable – 13.4 for women to 12.6 for men.

Student Experiences and Outcomes

Table 2. Ease of Transition Tasks

Response scale was 1 = very difficult; 3 = about average; 5 = going smoothly.

	2006	2007	2008	2009	2010
"Life" management: eating and sleeping regularly; doing laundry; paying bills on time, etc.	3.8	4.0	4.1	3.8	4.1
"School" management: getting to classes regularly and on time; keeping up with studies	3.5	3.7	3.7	3.7	3.7
Making new acquaintances: meeting and talking with people in social situations	3.8	4.1	4.0	4.0	4.0
Meeting other students: identifying people to check in with about classes, study with, attend co-curricular activities with	3.8	3.9	3.9	3.9	3.9

- The difference between female and male students' 2010 mean ratings of "school management" was statistically significant. Women rated it 4.0 compared to men's mean rating of 3.7.
- Two statistically significant differences were found between mean ratings of students living in Engineering House and those living in other on-campus residences. EH residents gave higher mean ratings to life management (4.3 vs. 4.0) and school management (3.8 to 3.6).

Table 3. Most Challenging Courses of First Semester

Survey Year	Mathematics	Chemistry	Engineering
2007	56%	24%	7%
2008	57%	27%	9%
2010	57%	22%	8%

- Challenging first-year courses remain quite consistent.

- Also consistent was the relatively small percentage of students who seek tutoring for those courses.

Table 4. Students' Academic Habits
Compare the following student profiles, taken from the 2010 Fall Survey.

Which of these helped you be successful?				*Which of these kept you from being successful?*			
Item:	**A**	**B**	**C**	**Item:**	**A**	**B**	**C**
Attended class regularly	x		x	Didn't attend class regularly		x	
Managed my time well	x			Poor study skills		x	
Helpful professor(s), mentor		x		Noisy residence environment			
Did all reading, homework	x			Didn't study enough	x	x	x
Motivation, persistence				Friends, sports, social activity	x		x
Helpful TA, tutor, resources	x	x		Didn't know how to get help			
Studied w/ other students	x	x		Poor time management		x	x
Support from family, friends	x			TV, video games, Facebook	x		x
Biggest challenges:	EngSci	EngSci Chem	IME 1020	Passing all courses:	yes	no	yes
Got tutoring for:	Math EngSci	Math Chem	Chem				

Table 5. Indicators of Student Involvement and Success

Indicators	**Registered with BroncoJOBS**	**Participate in engineering-related RSOs**	**Passing all courses**
positive responses	183 62%	81 27%	243 82%

- Male and female students were equally likely to have registered for BroncoJOBS and to be passing all courses.
- However, 61% of women reported participating in engineering-related student organizations compared to 24% of men.

Table 6. Outcomes of STEP Participation
Response scale was 1 = Strongly disagree; 3 = Uncertain; 5 = Strongly Agree.

	2005	**2006**	**2007**	**2008**	**2010**
I know at least 6 STEP students in my classes.	4.4	4.0	4.2	3.8	4.4
I have studied with other STEP students.	3.8	3.5	3.8	3.5	3.9
I participated in one or more activities my mentor has invited me to.			3.1	2.6	3.4
I know where to get tutoring for core courses.	3.5	3.7	3.7	3.7	4.0
I have used a tutor.	2.5	2.8	2.5	2.3	

- In 2010, 129 students (43%) reported using a tutor for one or more courses.
- Women were more likely to know where to get tutoring than men (4.5 to 4.0).
- Statistically significant differences were found in three items when students living in Engineering House were compared to engineering students in other on-campus residences.

- EH students were more likely to report studying with other STEP students (4.1 vs. 3.8), knowing where to get tutoring (4.3 to 3.9), and having used the Student Success Center in Bigelow Hall (3.2 to 1.8).

Table 7. Value of STEP Learning Community Components

Response scale was 1 = low value; 5 = high value.

Component	2005	2006	2007	2008	2010
a. cohort/group enrollment	3.7	3.6	3.8	3.7	3.8
b. finding a study group	3.5	3.5	3.5	3.5	3.6
c. faculty mentor	3.1	3.5	3.4	3.5	3.5
d. co-curricular activities	3.1	3.4	3.2	3.2	3.2
e. tutoring	3.1	3.2	3.2	3.3	3.3
f. living in Engineering House (n=117 in 2010)				3.9	4.2

- Statistically significant differences were found in three items when students living in Engineering House were compared to engineering students in other on-campus residences.
  - Students in EH rated more highly the value of cohort/group enrollment (4.1 to 3.7), co-curricular activities (3.5 to 3.1), and tutoring (3.6 to 3.2).

Table 8. Enrollment Plans for Spring 2011 Semester

Plan	Return to current program, major	Return to different program, same college	Return to WMU but different college	Other: Leave WMU or undecided
#, %	241 81%	24 8%	17 6%	14 5%

Discussions

1. How can we provide a tutoring experience for students so they will be familiarized and therefore more likely to use content tutoring in a later date?
2. Can we implement something similar to Paid Shoppers to gain the student's perspective of tutoring services and their experience with the Student Success Center?
3. Can we require students to take part in content tutoring? For example, get an instructor to adopt the policy that requires a student to go to tutoring sessions if his/her grade falls below "C."
4. Students may not know how to study. How can STEP help students learn how to study?

IV. *Progress Reports of STEP-UP Retreats*

Two retreats were held in June 2010 and January 2011 to kick-off and assess progress in Year 1 programs, respectively. Dr. Diane Anderson, Co-PI and V.P. for Student Affairs, gave an oral progress report of the retreats, in particular the issues that emerged during the January 2011 retreat – see Planning discussions below.

Planning and Discussions

I. Emerging Issues: At-Risk Students/Academic Habits/Student Participation

Background: The following emerging issues were identified at the January 2011 STEP Retreat:

1. **At Risk Group Conversation**

Trigger post-its

- Tutoring – student says "I know where to find [academic] help but don't know what to ask – I'm so confused."
- Follow up with "at-risk" students

Define "at-risk" student – focusing on first-year student

- Academic preparation/performance
- Academic performance changes radically

Identifiers

- 1st grades
- Midterm grades
- Fall grades
- ACT scores
- Math placement
- Enrolled in special programs – e.g., Bridge program
- 1st generation student*
- Financial parameters – little or no financial support from others*
  * Is there a way to capture this info? Who would have it?

Interventions

- Attendance initiative – involves Res Life, CEAS staff to follow up
- 1st grade information – academic advisor follow up
- Res Life professional staff conversations with students based on midterm and fall grades
- Referrals (ie. IME 1020)
  - Need to design a better follow up process that is sensitive to the student-student dynamic (student comfort with EPMs knowing sensitive academic information)
    - ✓ Faculty mentors having Instructor of Record access for their students
    - ✓ Assigned mentee groups for EPMs
  - Subset of fall cohort
  - Bridges participants
  - Add spring participants based on fall grades
  - Is there a natural saturation of how many mentees each EPM can have?
  - How are off campus students at risk connected?
    - ✓ Mandatory tutoring – math, writing
  - Hard to ask a professor to require tutoring (based on test scores) – maybe an option to enroll in a special program and "mandatory" component are part of the program
- How can faculty mentors be used with interventions?

Other

- Interventions need math's involvement
- Students need more awareness of midterm grades and how to find them – something faculty mentors can be involved with – meet with mentees, show how to look up grades, discuss grades?
- Impact of Fall Welcome – students are here 8 days before class – establishes social connections as a norm vs. academics; does it place the right importance on academics?

2. Academic Habits Group Conversation

Trigger post-its

- Apply the insights learned of students' life cycles in resident halls to develop strategies to improve academic habits
- Set expectations: 1 credit hour = ~3 hours of studies outside the classroom
- Apply the RA training experience to help students develop academic habits

Recommendations

- Lessons learned from RA Training -- activities to help students develop academic habits must be team-based to promote a bonding experience; fun/social to promote enthusiasm; have rewards – better grades
- One can procrastinate during the first-semester/first-year, but it won't work during sophomore year; promote group homework assignment (e.g., in physics, instructor assigns a weekly group homework)
- Media Campaign about "1 credit hour = ~3 hours of studies outside the classroom" need to use technologies appropriate to the target group – Twitter; viral video; message be to be "non-aggressive" – students have a rebellious nature and they would act the other way to prove the message "wrong"

3. Increase Student Participation Group Conversation

Trigger Post-It

- What are our successes in getting students to attend?
- How do we involve more students in each of our outreach activities?
- How can we extend "Bridges" to more students?
- More involvement of CEAS in EH/RA programming
- What are the reasons students don't participate in co-curricular activities?
  - Interfere study time?
  - Not interesting?
  - Doesn't help grades
- Emphasize career, personal, interpersonal development

Recommendations

- How do we set expectations for student participation for incoming students and their parents
- What are the skills and competencies for any/all "engineers"? Can these be delivered by first-year instructors?
- Students did not understand why they need to participate
- Relationship between success (grades) and participation
  - Value in "double dipping" for participation
  - Key is that something that is "required"
  - Food
  - Coordination (funneling communication)
  - "Expectations" set for students
  - Can we focus on the ones who do show up?

<u>Planning Questions</u>:

- What other stakeholders should be included in the discussions as STEP moves forward in Year 2 to address the emerging issues?

- What WMU policies/practices might be impacted as STEP moves forward in Year 2 to address the emerging issues?
- What insight does the Advisory Board have to share, and what strategies would the Advisory Board recommend to the project staff?
- ???

Discussions:

1. Since CEAS first-year students are group into cohorts/learning communities in which they take the same three-to-five courses together, can we use CRN to pull Cognos report on early/mid-term grade for a cohort of students? This would make it easier for the STEP Principal Investigator to pull the results and share them with the faculty mentors, than the current Cognos report for individual student.
2. Can we provide tutoring online to mesh with the habits and tendencies of the current generation of students?
3. Because first-year students are still carrying the habits of high school in college, how can we mimic the high-school learning environment during the student's initial months at college and slowly help them develop a new set of habits and values more amenable to success in college? For example, it is possible to extend the classroom period to include recitation or problem-solving session?
4. Summer Bridges to CEAS Success: Take advantage of the regional campuses of WMU (e.g., at Oakland Community College) and offer the Bridges program to students in the eastern part of the state.

II. Sustainability of STEP I

Background: At the August 2010 CEAS-STEP Advisory Board Meeting, it was recommended that the STEP Principal Investigator, Edmund Tsang, seek funding from foundations and corporations to sustain the learning community component of the first STEP grant (NSF expects institutions to sustain the best practices identified during the grant). The Provost Office has provided one-time funds in 2009 and 2010 to CEAS to support faculty members mentoring the learning communities and to cover some of programming costs.

With help from Maryann Lavender of the Development Office, proposals were submitted to Black and Veatch and to Lockheed-Martin in December 2010 and January 2011, respectively. However, Tsang did not feel he has a good grasp on what the corporations were looking for, because the guidelines were vague and because Tsang was not included in the discussion between Ms. Lavender and the corporations.

In 2010, the WMU Bookstore stopped the practice of allowing units within the university to piggy-back on its student planner. Consequently, the 2010 CEAS-STEP Student Planner was printed using an outside vendor and it did not carry any advertisement. [Previous STEP Student Planners carried advertisements because the arrangement was STEP supplied a section to be added to the WMU Bookstore student planner.] It was suggested that we sell advertisements in the 2011 CEAS-STEP Student Planner to generate revenues to support the STEP program.

Planning Questions:

- Should we solicit advertising in the 2011 CEAS-STEP Student Planner?

- If the answer is "affirmative," what guidelines should govern the solicitation and placement of the advertisements?
- ???

Discussions

1. The Advisory Board recommends sponsorship instead of advertisement to generate funds to support STEP: e.g., find a corporate sponsor for the STEP Student Planner.
2. Identify engineering companies that participate in Career Fair and/or offer co-op/internship to CEAS students, and ask them to sponsor a page of the student planner.
3. CEAS Dean Tony Vizzini will speak with the Development Office about more involvement of STEP Principal Investigator in preparing proposals to corporations or foundations.
4. Use multiple approaches to generate revenues.

III. Joint Recruiting with Community College

Background: In February 2011, the CEAS Curriculum Committee approved a proposal to revise the admissions requirement to the College. Under the new proposal, to be effective in Fall Semester 2012, students with MATH ACT 18 or lower will no longer be admitted to CEAS and they will be admitted to Exploratory Advising. Upon successful completion of MATH 1110 with a grade of "B" or better, the student may apply to join CEAS. The change in admissions requirement will be communicated to high schools by the CEAS Student Outreach and Recruitment Coordinator, who will also communicate multiple pathways to CEAS for students with different levels of preparation in mathematics.

CEAS was motivated to revise the admissions requirement because significant resources from the first STEP grant had been directed to students with MATH ACT 18 or lower with little significant results. Furthermore, the admissions revision is aligned with the guiding principles of CEAS admission: supports truth in advertising; maintains admission standard and improves the reputation of CEAS; and continues to provide access to students of all social and economic background.

We have previously discussed how to leverage the joint admissions program that WMU-CEAS has with Kellogg Community College and Muskegon Community College for joint recruiting. A pathway to CEAS involving one of our community college partners could be attractive to high school students with less preparation in mathematics.

Planning Questions:

- What other stakeholders from WMU should be involved in planning and implementing joint recruiting with community colleges?
- What WMU resources can we leverage to jointly recruit high school students with community college partners?
- ???

Discussions:

1. High-school counselors from Battle Creek area invited CEAS in 2009 to learn about the Joint Admissions Program between CEAS and Kellogg Community College.
2. WMU stakeholders that should be involved: Keith Hearit, Vice Provost for Enrollment Management, and Residence Life to offer the options of campus living.

3. CEAS Dean Tony Vizzini to convene a meeting with WMU stakeholders and relevant community college personnel.