Minutes of March 25, 2010 Meeting of WMU-STEP Advisory Board

1. Present: Dr. Diane Anderson, Dana Butt, Laura Darrah, Dr. Paul Engelmann, Dr. Len Ginsberg, Dr. Tim Greene (Chair), Cynthia Halderson, Dr. Dan Litynski, Dr. Ekk Sinn, Dr. Edmund Tsang.

2. Report on STEP I Results – see Briefing Report on STEP I Project in Appendix I.
   Discussions:
   a) Tim Greene asked how the CEAS Advising Office is using and responding to Mid-Term Grade Reports – The Advising Office has run a report on all first-year CEAS students in Spring Semester 2010 and identified those with a mid-term grade lower than a "C." There students are required to sign a release form acknowledging the consequence of being on academic probation. The form further states that if the student fails any of the prerequisite course(s), s/he will need to drop any affected courses from the next semester's schedule and to see the academic advisor again to revise the course schedule. The CEAS Advising Office will continue this practice of using the mid-term grade report for advising students.
   b) Paul Engelmann mentioned the frustration of CEAS instructors in using Banner to report first-work grade and mid-term grade. He requested the Provost Office to work with the Registrar's Office to create two columns on Banner – one for first work and the other for mid-term grade -- for instructors to report student work.
   c) In order for Student Affairs to share any disciplinary action regarding a student, the current release form that students sign during orientation to release "academic" records needs to be changed to "educational" records.
   d) While the early intervention initiative in IME 1020 did not seem to impact student performance in Technical Communication or in the fall semester, Laura Darrah stated it has allowed Residence Life staff to discuss issues that are important to student development. Paul Engelmann mentioned Engineering Peer Mentors (EPM) will be created in the new STEP IB program, and the EPM's may be more appropriate and more responsive to contact the students, since they live in the residence halls.
   e) STEP Advisory Board recommended continuing the practice of tracking students and contacting them, when an instructor reported a student is not attending classes. The Board also recommended to Edmund Tsang to delegate this task to another person in the project team.

3. STEP IB Planning – see STEP IB Planning Document in Appendix II.
   Discussions:
   a) To assist and prepare the STEP Advisory Board for the 3rd Year Review, Tim Greene suggested to the project team that it brings 2-3 questions on strategies and program directions to future board meetings for the Advisory Board to act upon.
   b) Tim Greene asked Dan Litynski and his staff from the Office of Vice President for Research to identify potential funding sources from foundations to sustain the STEP I efforts. Greene suggested inviting a representative from a foundation to attend the next STEP Advisory Board meeting.
   c) Since a target population for the STEP IB project is transfer students, the Advisory Board identified a potential barrier to success for transfer students, which is a mismatch between course(s) taught at a community college that is/are prerequisite to a WMU course.
   d) The STEP Advisory Board approved adding the Chair of Mathematics to the STEP Advisory Board and replacing external member, Dr. Penny Gilmore, with a member with background in engineering and applied sciences. Tim Greene said he will be meeting with provosts from MAC next week, and he requested a description of the external board member's responsibility so he can help the project recruit an external board member.

Appendix I - Briefing Report on STEP I Project

a. Total Number of Students Involved and Overall Retention Results

The total number of students impacted by the STEP project exceeded the number described in the original proposal.

	2004 cohort	2005 cohort	2006 cohort	2007 cohort	2008 cohort	2009 cohort	Total
Proposed in STEP Grant	72	96	120	240	360	NA	888
Actually Placed	19 (9 CEAS + 10 A&S)	277 (262 CEAS + 15 A&S)	316 (303 CEAS + 13 A&S)	362 (306 CEAS + 56 A&S)	444 (354 CEAS + 90 A&S)	461 (327 CEAS + 134 A&S)	1,879

The overall retention of the STEP students exceeded the WMU baseline retention described in the original proposal and compares favorably with national retention data. Because of the small sample size of the 2004 cohort, the retention results were not included in the comparison.

CSRDE[1]	WMU Baseline[2]	Retention	2005 Cohort	2006 Cohort	2007 Cohort	2008 Cohort
69%	57.4%	2nd Year	68%	70%	66%	66%
53%	42%	3rd Year	54%	55%	52%	
NA	33%	4th Year	46%	48%[6]		
40.7%[3]	32%[4]	5th Year	45.1%[5]			

[1] Data is for <u>all</u> institutions (Highly Selective, Selective, Moderately Selective, Less Selective) as reported in the 2005-06 Consortium for Student Retention Data Exchange (CSRDE) [1]. WMU is a "Moderately Selective" institution. 2nd year retention and 6th-year graduation rate for "Moderately Selective" institution is 62% and 24%.
[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% [1].
[4] WMU Office of Student Academic & Institutional Research, data averaged 2000-03.
[5] 9.4% of the 2005 Cohort has graduated and 35.7% are continuing in the 6th year for a combined 45.1%.
[6] 48.0% returned to STEM, plus another 2 students from this cohort have graduated with B.S. degrees in STEM.

b. Policies and Procedure Institutionalized

1. Creation of learning communities: A formal procedure has been established with the chemistry, mathematics, physics, and departments in the College of Engineering and Applied Sciences to save seats that would allow students to enroll in the same 3-to-5 classes together in Fall and Spring Semester of their first year at WMU. Such practice has streamlined the summer orientation and registration process in CEAS, and it allows the faculty and staff advisors to concentrate resources to enhance the overall experience for the incoming first-time, first-year students. It has also led to an increase in the percent of first-time first-year CEAS students who have met with academic advisors from Fall to Spring and from Spring to the Fall semester of the following year.

2. The practice of STEP students signing a release form to allow the STEP Principal Investigator to share in-semester progress with faculty mentors beginning in Fall Semester 2006 had led to an institution-wide mid-term grade reporting policy. It has also resulted in a policy in which students can grant their parents or guardians access to their financial, registration, and/or academic records.

3. An early intervention initiative involving the collaboration between CEAS and Residence Life was piloted in Fall Semester 2008 and again in Fall Semester 2009. Instructors of IME 1020, "Technical Communication," follow an established procedure to request the assistance of Residence Life staff to intervene on behalf of students who missed consecutive classes. The results of this early intervention

initiative are summarized in the table at the end of this report. This initiative has led to another pilot in Fall Semester 2009 in IME 1420, "Engineering Graphics," which uses students' Bronco card and a card-reader to take class attendance. The graphic user interface and software were designed by two Computer Science seniors as a part of the capstone design project. The results of the IME 1420 pilot were presented to the CEAS Executive Committee and they were well received. CEAS is currently investigating how to incorporate the IME 1420 effort to allow faculty teaching in the large lecture halls to take class attendance beginning Fall Semester 2010.

c. Partnership Established

1. Engineering House: The Engineering House (EH) in Bigelow Hall was created in Fall Semester 2006, and participation in EH has increased to 171 students in Fall Semester 2009.

2. WMU is a partner in a multi-institutional effort to increase the number of underrepresented ethnic minorities receiving undergraduate degrees in STEM. The Michigan-Louis Stoke Alliance for Minority Participation (MI-LSAMP) is funded by a grant from NSF from 2005-2010.

3. WMU is also a partner of a multi-institutional effort to improve engineering mathematics education funded by a NSF CCLI-Phase 3 grant from 2008-2011. A pilot section of ENGR 1990, "Engineering Mathematics," has been implemented in Fall Semester 2009 and Spring Semester 2010, and will continue in 2010-2011. The results of the pilot will be presented to CEAS faculty in Fall Semester 2011.

d. Publications Generated by Current STEP I Project

The original STEP I project has resulted in eight refereed conference proceedings publications involving 12 CEAS faculty and staff, three WMU staff members, and eight undergraduates.

1. E. Tsang, L. Darrah, P. Engelmann, C. Halderson, and D. Butt, "Work In Progress - Academic and Student Affairs Collaboration to Enhance Student Success in Engineering and Applied Sciences," Proceedings of Frontiers In Education Conference, Oct. 18-21, 2009, San Antonio, TX, CD-Rom, Session W2G.
2. E. Tsang and C. Halderson, "Create Learning Communities to Enhance Success for Students with Diverse Academic Preparation Background," Proceedings of Frontiers In Education Conference, Saratoga Springs, NY, October 22-25, 2008, CD-Rom, Session S1D, Paper 1771.
3. A. Eaton, B. Richmond, K. Warners, J. Cook, E. Tsang, B. Aller, and A. Kline. "Designing and Utilizing an Apparatus to Study the Ray Properties of Light," Proceedings of Spring Conference of American Society for Engineering Education North Central Section, Wright State University, Dayton, OH, March 29-30, 2008.
4. E. Tsang, B. Aller, T. Place, A. Kline, T. Moon, F. Severance, and C. Halderson, "Refining a Rubric for Evaluating Lifelong Learning and Career Awareness in a First-year Learning Community," Proceedings of Frontiers In Education Conference, Milwaukee, WI, October 10-13, 2007, Session F4A, Paper 1527.
5. E. Tsang, C. Halderson, and K. Kallen, "Work In Progress: Western Michigan University's Effort to Increase Retention of First-Time, First-Year Engineering and Applied Sciences Students," Proceedings of Frontiers In Education Conference, Milwaukee, WI, October 10-13, 2007, Session S1A, Paper 1425.
6. P. Pagano, A. Rossman, K. Vasilnek, B.M. Aller, A.A. Kline, E. Tsang, and E. Brabandt, "First-Year Experience and Beyond: Using the Engineering Design Process to Support Learning and Engineering

Skill Development," Proceedings of Annual Conference of American Society for Engineering Education**,** Honolulu, Hawaii, June 24-27, 2007, Session 2653. (level of contribution: 10%)

7. E. Tsang, C. Halderson, I. Abdel-Qader, B. Aller, S. Butt, A. Kline, D. Miller, T. Place, S. Yehia, and K. Kallen, "Assessment of Faculty Mentoring Strategies of Student Learning Communities at Western Michigan University College of Engineering and Applied Sciences," Proceedings of Frontiers In Education Conference, San Diego, CA, Oct. 28-31, 2006, Session S3E.
8. T. Place, B. Aller, and E. Tsang, "Evaluating and Improving Student Opportunities in a First-Year Learning Community: Lifelong Learning and Career Awareness," Proceedings of Frontiers In Education Conference, San Diego, CA, Oct. 28-31, 2006, Session M1E.

**Authors/co-authors who are undergraduates are underlined

Summary of Early Intervention in IME 1020 Involving Residence Life

Semester	Total # Referrals	# Instructor Making Referral	Total # Students Referred	# of Students with One Referral	Number of Students with 2 or More Referrals	Average IME 1020 GPA of All Referred Students	Average IME 1020 GPA of Students with One Referral	Average Fall Semester GPA of All Referred Students	Average Fall Semester GPA of Students with 1 Referral	# Return Next Spring
Fall 08	18	8	14	11	3	1.14[a]	1.39[b]	1.08[c]	1.39[d]	10
Fall 09	17	7	11	9	2	1.45[e]	1.61	1.45	1.56	10

[a]Three students withdrew from IME 1020 from this group
[b]Two students withdrew from IME 1020 from this group
[c] One student withdrew all classes from this group
[d] One student withdrew all classes from this group
[e]One student withdrew IME 1020 from this group

Appendix II - STEP IB: Effective Academic and Student Affairs Collaboration to Enhance Student Success in Engineering and Applied Sciences

This 5-year STEP IB grant is one of three new NSF awards to support student learning and success.

- *Increasing Opportunities and Improving Outcomes for Undergraduate Students in Engineering and Applied Sciences* – This program will award eight (8) scholarship of $6,000 each to first-time, first-year CEAS students in Year One, and support them as they progress in their academic career at WMU. This program will also add eight new awards to first-year CEAS students in Year Two for a total of at least 86 scholarships during the 5-year period of grant. Funding began December 2009.
- *Meeting the Challenge: the Michigan Louis Stokes Alliance for Minority Participation* – This 5-year grant builds on the original MI-LSAMP grant from 2005-2010. The new grant will establish partnership with Michigan community colleges and with the Atlanta University Center's Dual Degree Engineering Program to increase the number of B.S. STEM degrees awarded to underrepresented minorities. Recommended for funding to begin September 1, 2010.

STEP IB Project Goals, Outcomes, and Benchmarks

Goal #1: CEAS students in Engineering House (EH) and other Special Housing Options (SHO) develop academic skills and habits (note-taking and exam-taking skills, appreciation and use of tutoring and other support services), life skills (desire to seek programs for self-improvement, time management, balance of academic and social lives, managing stress, participation in co-curricular activities and professional engineering societies; professional conduct), and sense of connection (connect with fellow students, faculty, CEAS, and WMU) necessary for success in CEAS.

The outcomes for Goal #1 are: Students in EH/SHO

- Score at a higher level than non-EH/SHO students on co-curricular activity reports as assessed by the Evaluation Rubric based on Bloom's learning taxonomy.
- Use resources such as tutoring at a higher rate than non-EH/SHO students.
- Have a greater sense of connection to both CEAS and WMU than non-EH/SHO students.
- Have a higher GPA and are retained at a higher rate to CEAS than non-EH/SHO students.

Benchmark for Success: By the end of the 5-year project, the 2nd year retention to CEAS will be 75%; 3rd year retention to CEAS will be 65%, and 6-year graduation will be 55%. For community college transfer students, 2nd year retention to CEAS will be 10% higher than the baseline historic rate of 64% (averaged from 2006-2008).

Goal #2: Expand the pool of CEAS faculty and Student Affairs staff who actively collaborate to create structure and programming to enhance CEAS student success.

The outcomes for Goal #2 are:

- Create a strategic plan for collaboration so that each individual understands the other's cultural, philosophical, and programmatic strategies; the opportunities and strategies for collaboration; and indicators of success for formative and summative assessment.
- Expand the number of CEAS faculty and Student Affairs staff at WMU who actively collaborate to enhance CEAS student success.
- Evaluate the effects of active collaboration between CEAS and Student Affairs at WMU.

Benchmark for Success: Collaboration between CEAS and Student Affairs will expand to other units besides Residence Life (e.g., University Counseling and Testing Center, Career and Student Employment Services) and involve more CEAS and WMU-STEM faculty, staff, and administrators.

Goal #3: Recruit and retain increasing numbers of under-represented students -- females and under-represented minorities (URM) -- to CEAS.

The outcomes of Goal #3 are:

- Undergraduate enrollment of females and URM in CEAS increases to the national level.
- Retention and graduation rates in engineering and applied sciences of females and URM will be 10% higher than WMU's peer institutions.

Benchmark for Success: Enrollment of female and URM in CEAS increases by 10% each year such that they equal or exceed the national average by the end of project. Graduation rates of female and URM CEAS students are 10% higher than WMU's peer institutions as reported in CSRDE.

Planning Question:

1. NSF expects the best practices from the original STEP I grant be institutionalized and sustained internally. The new STEP IB grant will provide funds for new initiatives and off-set the costs of some student support programs. How can the STEP Advisory Board assist the program staff to find the additional dollars to sustain the retention efforts? (See breakdown of the STEP IB budget and programs on next page)

2. The Cognos Cube, built by John Hulsebus to support tracking student performance in the original STEP I grant, will not be maintained. A new request has been submitted to Office of Student Academic and Institutional Research. In the new STEP IB project, student performance and participation need to be tracked. What advice does the STEP Advisory Board have for the program staff to track student performance and participation?

Third Year Review

All Type 1A and Type 1B grants will be reviewed during their third year to determine whether satisfactory progress has been made, with continued funding contingent on the result of the third-year review. Third-year review questions include two questions for the advisory board:

- What is the relationship between the grant activities and the internal advisory board? How has the board been involved in assessing progress, addressing challenges or facilitating change, if needed, and addressing sustainability?

- What is the relationship between the grant activities and the external advisory board? How has the board been involved in assessing progress, addressing challenges or facilitating change, if needed, and addressing sustainability?

Planning Question

1. What support does the WMU-STEP Advisory Board need from the program staff to prepare for third-year review and to answer the review questions?

External Advisory Board Members

Two external members joined the WMU-STEP Advisory Board in 2006-07: Dr. Daina Briedis, Associate Professor of Chemical Engineering, Michigan State University, and Dr. Penny Gilmore, Professor of Chemistry and Biochemistry, Florida State University. During her first visit to WMU to participate in the WMU-STEP Advisory Board meeting in 2007, Dr. Gilmore gave a presentation to the Mallinson Institute for Science Education on action research in a chemistry classroom, and she was provided an honorarium for her presentation. Dr. Gilmore asked for an honorarium to participate in the 2008 STEP Advisory Board meeting, even though the invitation to her and Dr. Briedis to join the board indicates the participation will be *pro bono*.

Planning Questions:

1. Should a new external advisory board member replace Dr. Gilmore? Perhaps someone with an engineering and applied sciences background?

2. Should the Chair of WMU's mathematics department be invited to join the WMU-STEP Advisory Board?

STEP IB Program Implementation

$$ - New Dollars *$$ -- Off-Set Dollars* *$$ -- Need Continued Support*

Programs	Target Population	Start Date	Personnel	Budget
• Engineering House/Special Housing Option	All Students (Universal Programs)	9/1/2010 (onward)	Darrah*/Tsang♦	1 DOSA GA Yr. 1-5
• Engineering Peer Mentor, including Student Success Center	All Students (Universal Programs)	9/1/2010	Engelmann♦/Darrah*	• 5 Engineering Peer Mentors @ $4,015 each for Year 1; 8 EPM for Years 2-5 • Training ($40/day x 2 days/EPM x 5 EPM in Yr. 2; 8 EPM for Years 2-5) • $500 in Year 1 for Programming ($750 Yr. 2-3; $1,000 Yr. 4-5)
• Residence Assistant Programming	All Students (Universal Programs)	9/1/2010	Eikelberg*/Wall*/Tsang♦	• Residence Life budget
• Faculty Mentor • Student Assistant s to Faculty Mentors	1st-Year Students Faculty mentors	9/1/2010 9/1/2010	Anderson*/Tsang♦ Project Manager	$30,000 10,000
• Early Intervention Initiative	1st-Year Students	9/1/2010	Tsang♦/Darrah*	No cost
• Career Advising	1st-Year Student	9/1/2010	Swartz♦/Albertson (Maggio)*	Swartz: ½ Summer month in Yr. 1; ¼ summer month in Year 2 to develop materials for incorporation in IME 1020
• Summer Bridge Program • Engineering Math – ENGR 1990	1st Year Algebra II Students 1st Year Algebra II Students not in Bridge Program	7/1/2010 9/1/2010	Kline♦/Aller♦ CEAS Instructor	• Kline: ½ summer month in Yr. 1-5 • Aller: ¼ Summer month in Yr. 1-5 • 1 hourly Graduate Student Yr 1 ($3,500) • Programming Cost: $7,000 in Yr. 1; 3% increase in subsequent years No cost – part of teaching load
• Alumni Mentoring	• Female/URM • Returning Sophomore • CC Transfer	• 9/1/2010 (onward) • 9/1/2011 (onward) • 9/1/2011 (onward)	Abdel-Qader♦/Albertson*	• Abdel-Qader: ½ summer month in Yr. 1-5 • ½ CEAS-GA • $500 in Year 1 for Programming ($750 Yr. 2-3; $1,000 Yr. 4-5)
• Career Preparation	• Returning Sophomore • Female/URM • CC Transfer	• 9/1/2010 (onward) • 9/1/2011 (onward) • 9/1/2011 (onward)	Albertson (Maggio)*/Sitkins♦	• Sitkins: ½ summer month Yr. 1; ¼ summer month Yr 2; 1/8 summer month Yr. 3-5 • ½ CEAS-GA
• Engineering Experience	• Transfer • Returning Sophomore • Female/URM	• 9/1/2011 (onward) • 9/1/2012 (onward) • 9/1/2012 (onward)	Sitkins♦/Engelmann♦	• Sitkins: ¼ summer month Yr. 2; 1/8 summer month Yr. 3-5 • ½ CEAS-GA • $750 in Yr 2-3; $1,000 in Yr. 4-5 for programming

• Transfer Student Host	• CC Transfer	• 9/1/2010 (onward)	Conant♦/Wall*	1 Undergraduate Student Assistant • Summer – 20 hrs/wk x 10 wks x $15/hr • Academic Yr – 15 hrs/wk x 28 wks x $8.50/hr
• Recruiting (CC + High Schools)	• Female + URM	9/1/2010 (onward)	Conant♦/Ikhlas Abdel-Qader♦	• $8,000 to produce recruiting materials • $3,000 in Yr. 1-5 for operating
• Evaluate Student Essay Using Rubric	• 1st-Year student	9/1/2010 (onward)	Place/♦Aller♦	• Place: 1 summer month Yr. 1-5 • Aller: ¼ summer month Yr. 1-5
• Overall Project Administration and Reporting	• National Science Foundation • Advisory Board	• Yr.1-5	Tsang♦	• Program Manager @ $20,000, 3% increase subsequent year • 1 Undergraduate Student Assistant ○ Summer – 20 hrs/wk x 10 wks x $15/hr ○ Academic Yr – 15 hrs/wk x 28 wks x $8.50/hr
• Data Management		•	Tsang/Halderson	• 1 CEAS GA
• Project Management Team Bi-annual Retreat	• Project Management Team	• Yr. 1-5	Tsang♦/Darrah*/Project Manager	• $15/persons x 15 persons x 2; increase 25% each subsequent year
• Computers for Engineering House		• 9/1/2011	Tsang	• $10,000
• Project Evaluation – SAMPI Subcontract		• Yr. 1-5	Halderson	• $18,200 Yr 1; 3% increase each subsequent year
• Professional Development	• CEAS/DOSA	• Yr. 1-5	Tsang♦/Darrah*	• $4,000 in Yr. 1-5
• CEAS/DOSA Active Collaboration	• CEAS/DOSA	• Yr. 1-5	Tsang♦/Darrah/Engelmann♦/Anderson /Project Manager	• $15/person x 15 persons x 6 events/yr in Yr. 1-5
• Fall Welcome/STEP Kick Off /E-Week/March Outing/STEP Student Handbook STEP t-shirt/ • End-of-Year Celebration	• 1st Year Students	• Yr. 1-5	Tsang♦/Engelmann♦/Conant♦/Darrah */Eikelberg*	• $7,500 • 2 Summer Undergrad Student Assistant @ 20 hrs/wk x 10 wks x $15/hr • 3 Academic Yr Undergrad Student Assistant @ 15 hrs/wk x 28 wks x $8.50/hr • $500 in Year 1; $750 in Yr. 2-3; $1,000 in Yr. 4-5
• Create learning communities templates	• 1st Year Students	• Fall and Spring Semester, Yr. 1-5	Tsang/Advising Staff	• Part of work load

* DOSA (Division of Student Affairs); ♦ CEAS