

Getting Engineering and Student Affairs to Speak the Same Language: Enhancing Student Success


PRESENTERS

Edmund Tsang, Ph.D.
Associate Dean
for Undergraduate Programs & Assessment
College of Engineering and Applied Sciences

Laura Darrah
Assistant Director
Residence Life


Western Michigan University

25th International Conference on The First-Year Experience; July 18, 2012



Presentation Overview


- Background and Motivation
- Examples of Collaboration: Results & Lessons Learned
 - Engineering House
 - Student Success Centers/Engineer Peer Mentors
 - Alumni Mentoring of Female Students
 - Career Integration in IME 1020
 - At-Risk Student Intervention Using Mid-Term Grade Report
 - Mandatory Math Tutoring Pilot
- Unfolding of CEAS-SA Collaboration & Assessment
- Summary, Institutional Impact and Future Work



Background

Western Michigan University


- Founded in 1903; located in Kalamazoo, MI
- Among 76 public institutions designated by the Carnegie Foundation for the Advancement of Teaching as research universities with high research activity
- One of national's top 100 public universities in U.S. News & World Report's annual ranking of American colleges and universities
- Offers 140 undergraduate, 67 master's, one specialist, and 29 doctoral programs
- Fall 2011 enrollment: 19,966 undergraduate; 5,079 graduate
- Degrees Awarded (2009-10): 3,820 Bachelor's; 1,334 Master's; 1 Specialist; 110 doctoral
- CSRDE: "Moderately Selective"



Background

College of Engineering and Applied Sciences

- 16 undergraduate (10 engineering, 3 engineering technology, 3 applied sciences); 9 master's; and 6 doctoral programs
- Accelerated masters programs
- Undergraduate programs accredited by CAC, EAC, and ETAC of ABET, Inc.
- 2011 Fall enrollment: 2,307 undergraduate and 364 graduate students
- Degrees awarded (2009-10): 303 Bachelor's, 110 Master's, and 13 Doctorate
- Average ACT-MATH for incoming first-year students = 25.2
- CEAS does not have a common first-year curriculum




Background

Division of Student Affairs

- 16 units servicing students, parents, faculty and staff, including:


➢ Bernhard Center (union)	➢ Residence Life
➢ Career & Student Employment	➢ Sindecuse Health Center
➢ Children's Place Learning Center (daycare)	➢ Student Activities
➢ Dining Services	➢ Student Conduct
➢ Parent and Family Programs	➢ University Recreation
- House 6,500 students in on-campus apartments and residence halls; 1,800 students living in a residential learning community
- Offer more than 320 student organizations
- Voluntary accountability using the Council for the Advancement of Standards in Higher Education (CAS) standards



Background

CEAS Retention Efforts


- Began in 2005 with a NSF-STEP award focusing on first-time first-year students
- ~85% of all students attending summer orientation are placed in cohorts where they are enrolled in the same 3-5 courses in fall and 2-4 courses in spring semesters
- Each cohort is assigned a faculty mentor, often an instructor-of-record of 1st- or 2nd-semester course
- Academic performance and retention are tracked using students' WINS
- Engineering House (EH) started in 2006 as a residential learning community (CEAS and Res Life)
- Increasing collaboration between CEAS-Res Life and other units of Student Affairs since 2008
- Collaborative efforts strengthened through joint planning and submitting a proposal to National Science Foundation in 2009



Motivation

"Improving the quality of the undergraduate experience at any institution is so complex and multifaceted that it demands cooperation by the two groups on campus that spend the most time with students: faculty members and student affairs professionals... [A] faculty cannot by itself accomplish the college's objectives for students' intellectual and personal development; it needs the cooperation of others who work with students where students spend the majority of their time – in employment settings, playing fields, living quarters, and so on."

-- Banta and Kuh, *Change*, March/April 1998




Examples of Collaboration

Engineering House (EH)

Directed by Laura Darrah, Peter Larr and Dr. Paul Engelmann


Objectives


- Create a community that emphasizes peer support, facilitates success in a challenging degree program, and fosters a positive environment for academic and social success
- Create an environment where residents learn from one another, take advantage of CEAS academic support mechanisms, and self-create the type of environment that is supportive to their unique needs
- Students engage in social and education activities that incorporate examples of engineering or engineering principles



EH – Who & How

- Open to any CEAS student who self-selects to live in EH
- 50% of the hall is reserved for CEAS students (but they average 65% of the occupancy)
- Resident Assistants (RAs) on the engineering floors are CEAS majors
- Engineering RAs do 2 extra programs/semester incorporating engineering principles, career preparation or academic success
 - Cardboard Canoe
 - Spaghetti Towers
 - Jeopengineering
 - Somebody Hire Me
 - Right Brain, Left Brain






EH – Preliminary Results

- Significant growth, especially in the number of upper-level CEAS students in EH (485% growth in 5 years)

	2006	2011
Freshmen	88	163
Sophomore	12	49
Junior	1	11
Senior/Grad		3
Total	101	226

- 632 CEAS students in the residence halls Fall 2011 (13% of total residence hall occupancy)
- 40% of CEAS students in the residence halls are upper-level students (2011-12)
- Bigelow's grown from housing 19% of all CEAS residence hall students in 2006 to 36% in 2011

- Overall increase in the number of CEAS students returning to campus for consecutive years
 - 130% increase in second year students
 - 126% increase in third year students



EH – Preliminary Results


- Average mean GPAs of EH vs. non-EH students are higher

	Fall 2006		Fall 2007		Fall 2008		Fall 2009		Fall 2010		Fall 2011	
	Students	GPA	Students	GPA	Students	GPA	Students	GPA	Students	GPA	Students	GPA
EH	88	2.69	146	2.79*	179	2.75	176	2.79	173	2.62*	162	2.55
Non-EH	295	2.64	187	2.48	267	2.71	195	2.61	250	2.38	217	2.49
All	383	2.65	333	2.61	446	2.73	371	2.70	424	2.48	379	2.51

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

	Fall 2006		Fall 2007		Fall 2008		Fall 2009		Fall 2010		Fall 2011	
	Students	GPA	Students	GPA	Students	GPA	Students	GPA	Students	GPA	Students	GPA
EH	101	2.74	170	2.82*	213	2.75	226	2.79	226	2.68*	225	2.52
Non-EH	425	2.70	298	2.62	389	2.74	364	2.67	401	2.46	393	2.53
All	526	2.54	468	2.71	602	2.69	590	2.74	627	2.72	618	2.53


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



EH – Lessons Learned

About the Program

- It's challenging to find the perfect mechanism for engaging students and faculty outside the classroom
- Attendance at events is an ongoing challenge, but those who come have positive feedback





EH – Lessons Learned

About Collaboration

- Consistent communication and responsiveness are key in early stages
- CEAS colleagues attending Res Life's August training increased understanding of Res Life's processes, philosophies and expectations; more involvement with programming aided understanding residence halls rhythms and the life of students out of class (volunteer environment, maturity, student cycles)
- It's unrealistic to maintain consistent CEAS interaction with the engineering RAs beyond August training and occasional collaborative programs
- Even long-term collaborators can have relationship issues if assumptions are made regarding scope of influence when new ideas have facility or other implications for other programs



Examples of Collaboration

Student Success Centers /Engineering Peer Mentors (EPMs) Directed by Laura Darrah and Dr. Paul Engelmann

Objectives

- Provide tutoring and academic support where students live and at times reflective of when students study
 - Ease of proximity will increase student use
- Support first-year students in their academic transition to WMU



SSC/EMP – Who & How

- SSCs open Sunday – Thursdays from 7 or 8 pm to 1 am
- Card readers used for attendance tracking
- EPMs required to live in the residence hall with a SSC
- Year 1
 - 1 SSC in EH
 - staff of 4 (2-3 EPMs, 1-2 content tutors)
 - average 40 hours tutoring/week
- Year 2
 - 3 SSCs – 1 in EH, Ackley (honors) and French (upper-level student complex)
 - staff of 10 (6 EPMs, 4 content tutors)
 - average 75 hours tutoring/week



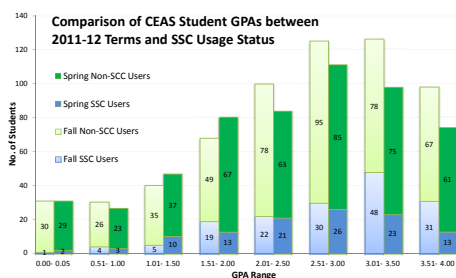
SSC/EMP – Preliminary Results

- Math is the most common reason CEAS students came to the SSC (Calc I and II highest use), followed by physics then chemistry
- CEAS students' frequency of SSC use:
 - 66% a few times/week
 - 12% less than 1/week
 - 12% use daily
- CEAS student's use the SSCs most often for:
 - 65% tutoring
 - 29% independent study
 - 25% group study



SSC/EMP – Preliminary Results

- Significantly struggling students do not come to the SSC at a high frequency (GPAs of 2.49 and below)




SSC/EMP – Preliminary Results

- Average term GPAs of SSC users continue to be higher than non-SSC users, especially for first-year students

	Freshman		Sophomore		Junior		Senior		Overall	
	GPA	#	GPA	#	GPA	#	GPA	#	GPA	#
Res Hall CEAS SSC Users	3.03*	96	2.67	49	2.26	13	2.50	2	2.85*	160
Res Hall CEAS non-SSC Users	2.34	283	2.40	106	2.68	44	2.91	25	2.42	458
All Res Hall CEAS Students	2.51	379	2.49	155	2.59	57	2.88	27	2.53	618

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




SSC/EMP – Lessons Learned

About the Program

- Staff growth increases supervision and changes employment expectations (e.g. GPA requirements)
- Observe student study habits to determine hours for each SSC
- “Regulars” who have a successful experience begin to bring in friends who are struggling
- Confidence in SSC staff is critical to repeat visitors

About Collaboration

- New initiatives need a higher degree of communication to guide the program, modify as you learn, and ensure everyone is on the same page
- As scale up issues emerge, joint decision making is essential to maintain program integrity
- When partners use different philosophies and operational procedures to address the same issue, education and compromise are needed



Examples of Collaboration


Career Integration in IME 1020

Directed by Dr. Edmund Tsang, Dr. Tom Swartz and Christopher Sell, with support from course instructors and Career and Student Employment Services staff

- ¾ of CEAS incoming first-time first-year students enroll in IME 1020, a Technical Communication course


Objectives

- Short term – Extend awareness of career preparation beyond first semester to second semester of Year 1
- Long term – Extend awareness of career preparation to Year 2




Career – Who & How

- Expose IME 1020 students to Career and Student Employment Services (CSEM)
 - Resume writing/critique, mock job-interview, etiquette dinner, etc.
 - BroncoJOBS, an online tool to browse and apply for on- and off-campus jobs and internships, and upload resume and cover letters
- CSES staff/peer tutors/GAs make presentations to 16 sections of IME 1020 in fall 2011
- IME 1020 students apply to participate in “STEP Into Your Career” in November 2011
- “STEP Into Your Career” applicants receive invitation for a resume workshop/industry panel in January 2012
- Resume workshop/industry panel held in February 2012



Career – Preliminary Results

- 301 students enrolled in IME 1020 in fall 2011
- 172 students (57.1%) submitted application to participate in “STEP Into Your Career”
- 172 students (57.1%) received e-mail invitation to attend resume workshop/industry panel
- 0 student (0%) attended resume workshop/industry panel spring 2012




Career – Lessons Learned

About the Program

- Not all CSES staff/peer tutors/GAs brought STEP Into Your Career application form; solution is IME 1020 Coordinator gives application form to instructors to hand out during CSEM presentation
- Students did not make the connection about career preparation between a CSES presentation in fall in IME 1020 and invitation to participate in resume workshop in spring semester; solution is to use peers (CEAS co-op or interns)

About Collaboration

- Regular conversation between IME 1020 and CSEM coordinators ensures smooth logistics and consistent message to students
- With minimal collaborative formality, CSES can add value to IME 1020 learning outcomes and IME 1020 can provide a venue to CSES to carry out its mission



Examples of Collaboration

At-Risk Student Intervention using Midterm/Term Grade Reports

Directed by Dr. Edmund Tsang, Dr. Paul Engelmann, Sandra Blanchard, Rebecca Sheffers, Sarah Hagen, Laura Darrah, and Peter Larr

Objectives

- Proactively identify at-risk students early on so interventions have highest likelihood to improve student success
- Provide personalized advice for academic success and regular follow up with identified students
- Students who are still struggling at midterms are referred to an advisor to either drop a class or re-examine major fit



At-Risk Students – Who & How

Who

- Focused on first-year, continuing second year and first-semester transfer students with a fall term GPA range of 1.50-1.99 who reside on campus

How

- Required meeting with GA (first-year and transfer students) or Associate Dean (second year students) within the first 6 weeks of spring semester; ongoing follow up connections
- Personalized recommendations for academic habit changes are given after the initial diagnostic meeting
- Students with a “C” or below spring midterm grade required to meet with CEAS advising staff



At-Risk – Preliminary Results

- Met with 46 students (68% response rate)
- On average all improved their GPAs.

- First-year students who did not respond to the meeting request (intervention) saw a decrease in GPAs

Student Type	Intervention	No Intervention
Freshmen	0.274 n=18	-0.363 n=12
Continuing	0.658 n=24	0.804 n=4
Transfer	0.768 n=4	0.349 n=6

- Even with these improvements, several students who fell on the lower end of the spectrum most likely did not move out of good academic standing



At-Risk – Lessons Learned

About the Program

- Program design must take into consideration staffing and time constraints
- Evaluate what are the best GPA ranges to target where the intervention will have the maximum impact
- Still working on the best communication approach with students to increase likelihood of responding to the meeting request
- Addressing the narrow window between midterm grades released and the last drop date for class



At-Risk – Lessons Learned

About Collaboration

- It takes longer to plan with a large group, but the end result is the perfect hybrid of best practices and new ideas
- Success happens when everyone is equally invested in the outcome
- Lessons learned about tools or resources available can aid future requests to Institutional Research for information, or other new initiatives



Examples of Collaboration

Mandatory Math Tutoring Pilot *Directed by Dr. Edmund Tsang, Laura Darrah, Dr. Annegrett Paul, Dr. Christine Horsmon and Dr. Jay Treiman*

Objectives

- Increase math proficiency of CEAS students
- Students who attend tutoring will learn a positive academic habit and continue it moving forward
- Create a stronger partnership with the Department of Mathematics




Mandatory Math – Who & How

Who

- One section each of Pre-Calc and Calculus I included in the pilot
- CEAS students form a majority of the pilot sections' roster

How


- Instructors required students with 65% or below on homework, quizzes or exams to attend tutoring in the SSC
- Bi-weekly data of who attended tutoring provided to faculty for tracking



Math – Preliminary Results

Mandatory Math Pilot Sections GPA and SSC Use Comparison			
Math 1180 – Pre-Calculus		Math 1700 – Calculus	
44	Course Enrollment	33	Course Enrollment
22	Total # unique SSC visitors	19	Total # unique SSC visitors
2.29	Average GPA	2.57	Average GPA
2.45	Average GPA of SSC users	2.47	Average GPA of SSC users
2.12	Average GPA of non-SSC user	2.78	Average GPA of non-SSC user
0.33	Difference in GPA	-0.31	Difference in GPA
50%	Percentage of mandatory section that visited an SSC	58%	Percentage of mandatory section that visited an SSC

- Largest impact on Pre-Calc class
- Requiring tutoring increased SSC usage significantly compared to non-mandatory sections (69% of Pre-Calc students and 79% of Calc students attending the SSC came from mandatory tutoring sections)
- The habit of using the SSC did not continue into spring (35% of pilot students used the SSC in the spring)




Math – Preliminary Results

- There is a positive distinction between the GPA of the mandatory sections and the non-mandatory sections of the courses

Fall 2011 Grade Distribution Among all Pre-Calc and Calc I Sections			
	# Students	Average Course GPA	Passed
Pre-Calc 1	44	1.63	20 (45.5%)
Pre-Calc 2	38	2.11	18 (47.4%)
Pre-Calc 3 – Pilot Section	44	2.28	29 (65.9%)
Calc 1	30	1.92	18 (60.0%)
Calc 2 – Pilot Section	38	2.23	27 (71.1%)
Calc 3	39	2.06	23 (59.0%)
Calc 4	34	1.93	18 (52.9%)


– Variables not factored in: time of day of the class, instructor



Math – Lessons Learned

About the Program


- Students did not respond to a punitive model for using/not using the SSC (one class stated that to gain the 0.5% required re-doing the assignment perfectly, and students said it was not worth their time or the points).
- There are multiple ways to teach solving the same problem, which sometimes impacted perceived SSC staff credibility or created stress for the student seeking assistance
- Several times SSC staff would feel pressured that the students' grade was dependent on them.
- Exploring if Supplemental Instruction is a better model to provide tutoring, with the SSC as added support
 - SI tutors sit in on the class and provides a set number of tutoring hours



Math – Lessons Learned

About Collaboration

- Give the math faculty academic freedom for how to implement the concept in their class
- Important to follow through with SSC usage data
- Be responsive to concerns when shared, especially when new players are at the table
- Use data from Year 1 to solicit continued support and recruit for a Year 2 pilot
 - Based on Year 1 success and looking at course pass/fail rates, invited an Algebra II instructor to join the pilot
- Partners involved may shift
 - Calc I faculty still considering continuing with the pilot
 - Pre-Calculus instructor interested in continuing




Examples of Collaboration

Alumni Mentoring: Women in Engineering Mentoring Network (WEMN) *Directed by Dr. Ikhlas Abdel-Qader*

Objectives

- Connect first-year and sophomore female engineering students with female mentors who have taken similar paths
- Help female students learn the skills and be aware of potential road bumps to be successful in college and in engineering careers
- Create a resource for female students that will provide them with answers about any academic and career questions from WMU women alumni professional engineers in the area who have succeeded in starting a professional career in engineering



WEMN – Who & How

Mentors

- Kalamazoo-area female professional engineers who are also WMU alumni
- One mentor is not a WMU alumni

Mentees

- Year 1: First-year female students
- Year 2: First-year and Sophomore female students
- Year 3: Juniors added to some mentoring groups



WEMN – Who & How

- Mentors are invited to become a mentor in August
- Students are invited to apply in September
- Student applications typically number more than available mentors, especially in some engineering fields (e.g. chemical engineering)
- Mentors and mentees are introduced to each other in an opening event in early October
- Mentors and mentees receive emails, Facebook messages, and phone calls about events to stimulate interactions



WEMN – Preliminary Results

- Mentors grew from 11 to 17 (54% increase) and mentees from 11 to 21 (91% increase) from Year 1 to Year 2
- The “most beneficial” activities consistently reported by both groups are:
 - learning more about what engineers do,
 - making good career decisions, and
 - gaining confidence as a woman in engineering
- Satisfaction with the program is reported to be high for both groups
- Women students report consistently high “certainty” in their choice of engineering as a career (above 8 on a 10-point scale)



WEMN – Lessons Learned

About the Program

- Communicating with mentees who do not live in the Engineering House remains a challenge
- It is difficult to find one night when all alumni are free to attend the opening and exit events
- In some cases, first-year mentees were hindered by their shyness towards their mentors
- Some students felt awkward bonding with an adult they only met once or twice



WEMN – Lessons Learned

About Collaboration

- Early communication on work expectations and responsibility is crucial
 - Year 2 replaced Student Affairs staff with Development & Alumni Relations staff and College of Engineering and Applied Sciences Engagement Officer
- Having the Engineering House (EH) Hall Director and a student employee who resides in EH as part of the WEMN team lead to better communication with students who reside in EH
- The value of early communication about work expectations and partner responsibility



CEAS-SA Collaboration

- Many confuse communication and cooperation with collaboration
- Collaboration Spectrum

Informing ↔ Communicating ↔ Cooperating ↔ Collaborating
- Collaboration
 - Understand (and respect) each other's culture, language and organization characteristics, and philosophical and programmatic approaches
 - Identify the roles and opportunities for faculty and student affairs professionals in student development
 - Joint planning, implementation, and accountability




CEAS-SA Collaboration

R. Gajda's rubric¹ to assess collaboration

- Five guiding principles
 - An imperative; known by many names; a journey, not destination; personal is as important as procedural; develops in stages
- Rubric assesses 4 collaboration dimensions
 - Purpose; Strategies & Tasks; Leadership & Decision-Making; Interpersonal and Communication
- Rubric has 5 stages/levels of integration/collaboration
 - Networking, Cooperating, Partnering, Merging, and Unifying (form a single organizational unit)


¹Gajda, R. (2004). "Utilizing Collaboration Theory to Evaluate Strategic Alliance," *American Journal of Evaluation*, Vol. 25, No. 1, pp. 65-77



CEAS-SA Collaboration

Modified Gajda's Rubric – **Purpose**


Level 1 Networking	Level 2 Cooperating	Level 3 Partnering	Level 4 Merging
<ul style="list-style-type: none"> Set up a web of communication Identify and create a base of support Explore interests 	<ul style="list-style-type: none"> Work together to ensure tasks are done Identify resources Identify mutual needs but maintain separate identifies 	<ul style="list-style-type: none"> Share resources to address common concerns Units remain autonomous yet willing to cross over to meet mutual goals 	<ul style="list-style-type: none"> Merge resources to support commitment for the long term to achieve short and long-term outcomes



CEAS-SA Collaboration

Modified Gajda's Rubric – **Strategies & Tasks**


Level 1 Networking	Level 2 Cooperating	Level 3 Partnering	Level 4 Merging
<ul style="list-style-type: none"> Loose or no structure Flexible, roles not defined Few if any defined tasks 	<ul style="list-style-type: none"> Member connections are advisory Minimal structure Some strategies and tasks identified 	<ul style="list-style-type: none"> Strategies and tasks are developed and maintained Central body of people People have specific tasks 	<ul style="list-style-type: none"> Committees and/or subcommittees to support strategies and tasks Specific and complex strategies and tasks identified



CEAS-SA Collaboration

Modified Gajda's Rubric – **Leadership & Decision Making**


Level 1 Networking	Level 2 Cooperating	Level 3 Partnering	Level 4 Merging
<ul style="list-style-type: none"> Non-hierarchical Flexible Minimal or no group decision making 	<ul style="list-style-type: none"> Non-hierarchical, decisions tend to be low stakes Facilitative leaders, usually voluntary Several people form "go-to" hub 	<ul style="list-style-type: none"> Autonomous leadership Members share equally in the decision making Decision making mechanism are in place 	<ul style="list-style-type: none"> Strong, visible leaders Sharing and delegating of roles and responsibilities Leadership capitalizes on diversity and organizational strengths



CEAS-SA Collaboration


Modified Gajda's Rubric – **Interpersonal & Communication**

Level 1 Networking	Level 2 Cooperating	Level 3 Partnering	Level 4 Merging
<ul style="list-style-type: none"> Very little interpersonal conflict Communication among all members infrequent or absent 	<ul style="list-style-type: none"> Some degree of personal commitment and investment Minimal interpersonal conflict Communication among members informal but clear 	<ul style="list-style-type: none"> Maybe some inter-personal conflict Communication system and formal information channels developed Evidence of problem solving and productivity 	<ul style="list-style-type: none"> High degree of commitment and investment Possibility of interpersonal conflict high Communication is clear, frequent and prioritized High degree of problem solving and productivity



CEAS-SA Collaboration – Results

- Assessed at end of Year 2 during Planning Retreat for Year 3
- Collaboration rated by 14 CEAS and SA participants
- Two CEAS and two SA participants were completing their first year on project; majority of remaining 10 participants were involved in STEP since 2005
- Some participants involved in more than one collaborative effort; they were asked to rate each effort yielding a total of 26 ratings
- 16 ratings (62%) were completed by CEAS participants and 10 ratings (38%) by SA participants




CEAS-SA Collaboration – Results

CEAS-SA Collaboration Overall Ratings					
	1	2	3	4	
Dimensions	Networking	Cooperating	Partnering	Merging	Mean
Purpose	3 (12%)	8 (31%)	12 (46%)	3 (12%)	2.6
Strategies and Tasks	0 (0%)	10 (39%)	14 (54%)	2 (8%)	2.7
Leadership & Decision Making*	1 (4%)	10 (39%)	9 (35%)	5 (19%)	2.7
Interpersonal & Communication*	3 (12%)	4 (15%)	13 (50%)	5 (19%)	2.8

* There was one non-response to these items


- At the end of Year 2, mean rating for each of the four dimensions of collaboration is just under 3 using the Gajda rubric



CEAS-SA Collaboration – Results

Dimensions	Units	Mean	t statistics	a value
Purpose	CEAS	2.56	-.11	.92
	SA	2.60		
Strategies and Tasks	CEAS	2.81	1.27	.22
	SA	2.50		
Leadership & Decision-Making	CEAS	2.60	-.87	.40
	SA	2.90		
Interpersonal and Communication	CEAS	2.73	-.44	.66
	SA	2.90		

- No statistically significant difference between CEAS and SA
- “Strategies & Tasks” and “Leadership & Decision-Making” show larger difference




CEAS-SA Collaboration – Results

Dimensions	Units	Mean	t statistics	a value
Purpose	1 st -Year	1.75	-2.27	.03*
	Veteran	2.73		
Strategies and Tasks	1 st -Year	2.50	-.67	.51
	Veteran	2.73		
Leadership & Decision-Making	1 st -Year	2.75	+.08	.94
	Veteran	2.71		
Interpersonal and Communication	1 st -Year	2.75	-.18	.91
	Veteran	2.81		

* Mean difference was statistically significant at $\alpha \leq 0.05$

- May have implications for induction of new personnel




CEAS-SA Collaboration

Reflections from Administrative Level

CEAS

- “Collaborating with Student Affairs affirms my understanding and appreciation that student success goes beyond the academics and retention.”
- “There is much that can be accomplished with minimal collaborative formality, if the focus is on the students and their well-being.”
- “Relationship is key to accomplishing anything meaningful in the academy.”




CEAS-SA Collaboration

Reflections from Administrative Level

SA

- “Our goal is to ensure a distinctive learner-centered learning environment.”
- “The high possibility of conflict is not necessarily a negative. Sometimes conflict occurs *because* the focus is on diversity. If it occurs in the context of strong commitment and problem-solving, it can often be resolved productively.”




CEAS-SA Collaboration

Reflections from Program Coordinators

CEAS

- “One size of education does not fit all students.”
- “I appreciate how critical what the student does outside of class is when there are no parents to put on limits. What is the impacts of loneliness, uncertainty, difficulties with a roommate on students’ adjustment and success? I have never worked with people trying so hard to enable that kind of growth.”
- “The overall collaboration has been valuable. It helps that other people reinforce our career development messages, and it’s always good to get multiple perspective on a resume.”



CEAS-SA Collaboration

Reflections from Program Coordinators

SA

- “From assessing the outcomes of the Student Success Center, I know the language to speak to administrators in other departments to show its positive effects and create similar programs.”
- “Great ideas are not enough. They need organization and structure in order to be implemented.”
- “It is important to be clear, to identify goals and expectations early. Then we can decide whether to develop a new program or use an existing program.”
- “It’s important to make partners aware of their value.”



CEAS-SA Collaboration

Observations

- Can add value to a program even without “formal” collaboration, e.g., Bridges program able to increase student participation through contacts with Residence Life to add a housing option; career integration in Technical Communication
- A different partner sometimes better serves the program constituents, e.g. Alumni Affairs identified for WEMN



CEAS-SA Collaboration

The Key to our Collaboration Successes

- “It works because both groups are committed to student learning.”
- “It’s not just a meeting; it’s a relationship.”



Summary

Comparison of Performance in 1st-Year STEM Courses

	Fall 2009		Spring 2010		Fall 2010		Spring 2011		Fall 2011	
	STEP	Comparison	STEP	Comparison	STEP	Comparison	STEP	Comparison	STEP	Comparison
Algebra I (MATH 1100)	72.2	65.7	33.3	55.4	45.5	76.9	71.4	51.1	83.3	64.9
Algebra II (MATH 1110)	64.4	52.3	30.8	52.1	59.5	46.0	33.3	42.3	61.0	46.9
Pre-Calculus (MATH 1180)	58.0	50.8	66.2	46.4	63.6	59.2	77.4	55.7	65.6	46.0
Calculus I (MATH 1200)	69.5	67.1	85.0	68.2	66.7	57.9	58.8	57.3	63.1	57.9
Calculus I (MATH 1220)	81.0	62.9	55.0	44.4	75.0	62.1	76.7	52.0	78.6	50.0
Calculus II (MATH 1710)	61.3	50.0	47.9	60.4	-	-	61.1	48.1	90.9	61.1
Calculus II (MATH 1230)	72.2	52.5	79.2	52.7	80.9	53.8	88.4	63.3	66.0	50.0
CHEM 1100	79.2	64.5	74.4	68.6	84.3	74.2	73.5	76.3	80.8	67.4
PHYS 1130	-	-	87.5	95.2	-	-	100.0	44.7	-	-
PHYS 2050	-	-	70.4	52.3	-	-	80.2	47.8	-	-
IME 1020	91.1	81.4	-	-	85.4	77.4	-	-	88.4	76.9
IME 1420	94.2	85.5	-	-	93.4	83.8	-	-	94.8	81.0



Summary

Statistical Analysis (significant difference if less than $\alpha = 0.01$)

Chi-Square Test	Test Value (p)							
	Fall 2009	Sp 2009	Fall 2010	Sp 2010	Fall 2011	Sp 2011	Fall 2011	Sp 2011
Algebra I (MATH 1100)	0.649 ¹	0.643 ^{2,3}	0.561 ⁴	0.443 ⁵	0.001 ⁶	0.286 ⁷	0.343 ⁸	
Algebra II (MATH 1110)	0.991 ¹	0.354 ²	0.658 ³	0.033 ⁴	0.096 ⁵	0.454 ⁶	0.080 ⁷	
Pre-Calculus (MATH 1180)	0.002 ¹	0.018 ²	0.216 ³	0.005 ⁴	0.464 ⁵	0.004 ⁶	0.000 ⁷	
Calculus I (MATH 1200)	0.001 ¹	0.080 ²	0.743 ³	0.041 ⁴	0.260 ⁵	0.176 ⁶	0.354 ⁷	
Calculus I (MATH 1220)	0.057 ¹	0.057 ²	0.012 ³	0.375 ⁴	0.183 ⁵	0.902 ⁶	0.001 ⁷	
Calculus II (MATH 1710)	0.329 ¹	0.119 ²	0.183 ³	0.219 ⁴	-	0.004 ⁵	0.010 ⁶	
Calculus II (MATH 1230)	0.007 ¹	0.015 ²	0.015 ³	0.002 ⁴	0.019 ⁵	0.004 ⁶	0.077 ⁷	
CHEM 1100	0.000 ¹	0.375 ²	0.000 ³	0.297 ⁴	0.018 ⁵	0.027 ⁶	0.004 ⁷	
PHYS 1130	-	0.530 ²	-	0.263 ³	-	-	-	
PHYS 2050	-	0.007 ²	-	0.013 ³	-	0.000 ⁴	-	
IME 1020	0.063 ¹	-	0.011 ²	-	0.003 ³	-	0.011 ⁴	
IME 1420	0.004 ¹	-	0.008 ²	-	0.007 ³	-	0.000 ⁴	

¹ The STEP group contained less than 5 observations for a given category, pass or fail.
² The difference of enrollment between coques and course record was at least 50 students

CHEM 1100, IME 1020, IME 1420, MATH 1180, MATH 1220, and MATH 1710 – STEP performed better than the comparison.



Summary

Improvements in retention to and graduation in CEAS

CSDRE ¹	WMU Baseline ²	Retention to CEAS	2005 (262)	2006 (303)	2007 (306)	2008 (349)	2009 (315)	2010 (347)
69	57.4	2 nd Year (%)	68.0	70.1	66.3	67.5	66.0	62.2 ¹²
53	42.3	3 rd Year (%)	54.3	52.8	52.0	52.1	49.7	
NA	32.7	4 th Year (%)	44.5	48.8 ⁶	43.3	47.6		
NA	32.8 ⁴	5 th Year (%)	44.6 ⁵	45.0 ⁸	42.8 ¹¹			
40.7 ³	32.3 ⁴	6 th Year (%)	41.6 ⁷	45.1 ¹⁰				
NA	NA	7 th Year (%)	40.8 ⁹					

¹For all institutions, 2005-06

²Averaged 2000-2004, from CSRDE

³37.4% graduated in a STEM field in 5 yr

+ 3.3% continued in 6th yr

⁴WMU-IR, averaged 2000-03

⁵35.1% continued in 5th yr + 9.5%

graduated with CEAS degrees in 4 yr

⁶48.8% continued in CEAS in 4th yr +

2 graduated with CEAS degrees in 3 yr

⁷14.9% continued in CEAS in 6th yr + 26.7%

graduated with CEAS degrees in 5 yr

⁸32.4% continued in 5th yr + 12.6%

graduated with CEAS degrees in 4 yr

⁹2% continued in CEAS in 7th yr +

36.6% graduated with CEAS degrees in 6 yr

¹⁰14.7% continued in CEAS in 6th yr +

30.4% graduated with CEAS degrees in 5 yr

¹¹34.7% continued in CEAS in 5th yr + 8.1%

graduated with CEAS degrees in 4 yr

¹²13 students with GPA ≥ 2.00 enrolled in 2-yr

and 7 students with GPA ≥ 2.00 enrolled in another 4-yr institutions



Impact of Project on Institution

- Export successes from CEAS-SA collaboration to other colleges/units
 - Mimic relationship structure and/or events with other residential learning communities
 - Haworth College of Business funded a tutor to work three evenings/week in the residence hall hosting the Business Learning Community
 - Academic Resource Center added a tutor for math, biology and chemistry in a residence hall with science and health students
- Tap SA resources to support CEAS student groups (faculty advisors and student leaders)
- Colleagues from math and Exploratory Advising joined CEAS faculty and staff in workshops on metacognition by Dr. Sandra McGuire



Impact of Project on Institution

- A university-wide class attendance reporting initiative was based on a pilot where IME 1020 faculty notified CEAS Associate Dean and Residence Life of attendance/class performance issues, and residence hall professional staff then met with the student to discuss academic concerns
- Purchased software to allow students to grant parents to academic records
- The Provost and Vice President of Student Affairs, two key change agents for the university, are part of the STEP Advisory Board



Future Work

- Incorporate “metacognition” in all student success strategies, emphasizing Bloom’s taxonomy, learning and study cycles
- Expand mandatory math tutoring to include Algebra II and explore Supplemental Instruction model for tutoring
- Refine at-risk student GPA ranges to target those ranges where intervention will have the greatest student impact
- Test new reports from Institutional Research based on college and subject codes to streamline turnaround with at-risk intervention programs
- Raise questions regarding a short response window between midterm grades released and last drop date



Future Work

- Develop a tutor training model for SSC staff
- Fine tune rubric to evaluation collaboration
 - remove redundant phrases
 - clarify distinctions between the levels
 - Separate aspects of a dimension, e.g., separate “leadership” from “decision-making”
- Investigate the differences in collaboration rating between partners in a program



Acknowledgement

- Partial support from National Science Foundation STEM Talent Expansion Program (STEP) award # 0336581 and 0969287
- Additional STEP Leadership Team members: Paul Engelmann, Ikhlas Abdel-Qaderl, Diane Anderson, Cynthia Halderson, and Anetra Grice
- www.wmich.edu/step



Contact Information

Western Michigan University

Laura Darrah
Assistant Director
Residence Life
(269) 387-4463
laura.darrah@wmich.edu



Dr. Edmund Tsang
Associate Dean for Undergraduate Programs & Assessment
College of Engineering and Applied Sciences
(269) 276-3249
edmund.tsang@wmich.edu