

Michigan State University



College of Engineering Strategic Plan

(2009-2014)

*“...in pursuit of leadership in research,
education, and technology transfer”*

What We Stand For

Mission (where we are and what we do today)

At Michigan State University, the mission of the College of Engineering is: *“To deliver the highest quality engineering graduates, cutting-edge research and innovative technology for the benefit of society locally and globally.”*

Core Values (basic, sustaining beliefs)

The College of Engineering is guided by the following core values in delivering its mission and pursuing its vision.

*We believe, as a land-grant university, in **educating people** with the necessary skills to advance the engineering “state of the art.” Imparting knowledge to students at all levels including secondary, undergraduate, graduate, and lifelong learning is implicit in this core value.*

*We believe in the discovery of **new knowledge through innovative research** that encourages entrepreneurship and economic development to benefit our global society.*

*We believe in **inclusiveness and collaboration** on a worldwide basis. We both teach and follow ethical, environmentally responsible engineering practice.*

Vision (where we want to be in five years)

The Vision of the College of Engineering is: *“To be recognized as an international leader in engineering education, research and the application of knowledge to benefit society globally.”*

What We Stand For

Role of the College of Engineering Strategic Plan (ESP)

The role of the College of Engineering Strategic Plan (ESP) is to act as a guide for efficiently achieving our long-term leadership goals. The process of building the ESP has helped us to focus on the Key Strategic Issues (KSIs) that must be addressed if we are to meet the needs of our students, faculty, external partners and the university over the plan period.

While no plan is perfect or can accurately forecast the future in every respect, the ESP lays out the issues, strategic objectives and action plans to better anticipate and respond to future challenges and opportunities. The five-year plan period is for the 2010- 2014 calendar years.

Mission

As shown on the verso page, the College of Engineering (CoE) mission clearly states what the nature of our business is in today’s educational environment. Important factors embedded in the mission include educating the highest quality graduates, producing cutting-edge research and generating innovative technology.

Core Values

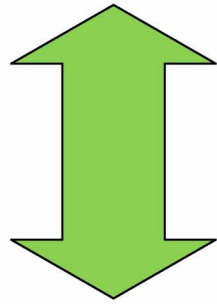
Core values guide MSU Engineering day-to-day activities and choose the course for future action. Our core values are vital to maintaining our long-term viability, especially including *“educating people,” “discovering new knowledge,”* and *“preserving inclusiveness.”*

Vision

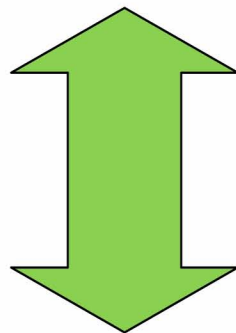
The CoE vision is vital to building a road map to where we want to be in five years. Global leadership in education and research are critical to the vision as is the application of new knowledge.

Developing Key Strategic Issues (KSIs)

1. Leadership in Research



2. Leadership in Education



3. Leadership in Technology Transfer

Developing Key Strategic Issues (KSIs)

The ESP Team Process

Through a series of team dialogues, the ESP team followed a process that led to consensus on three KSIs the College of Engineering must address if the five-year vision is to be realized. After agreeing on mission, core values and vision, the team brainstormed the **Strengths, Weaknesses, Opportunities and Threats** (Appendix A1) facing CoE that ultimately pointed the team toward agreement on the three KSIs on the verso page.

The KSIs are not independent of one another. In fact, the KSIs are clearly interdependent. Addressing any one issue will have an impact on the other issues.

Overview of Strategic Objectives for Leadership

Strategic objectives were developed to help address each of the KSIs. They encourage new ways of doing business. As the following pages illustrate, the strategic objectives summarized below guided the “mapping” of detailed action plans toward addressing each of the Key Strategic Issues and the ultimate vision of leadership.

Strategic Objectives for Leadership

Increase External Funding

Increase External Recognition

Recruit and Retain Higher Quality Students

Establish the MSU Engineering Education Research Institute

Establish the MSU Applied Research Institute

Improve Industrial Collaboration and Entrepreneurship

The following pages summarize the importance of the strategic objectives above, the influence of peer institutions, and how they will help address each of the KSIs.

Strategic Objectives and Action Plans

Legend: R=Research, E=Education, TT=Tech Transfer

	<u>KSI Benefit</u>	<u>Action Plans</u>
Establish a Comprehensive Strategy for Increased Funding		
• Increase \$/FTE	R	A2
• Increase centers	R	A3
• Increase core investment for research	R	A4
• Graduate funding	E, R	A13
• Undergraduate funding	E, R	A13
• Post-baccalaureate funding	E	A13
Increase External Recognition for Faculty and Students		
• Faculty	R,E	A5a
• Students	R,E	A5b
• Image	R,E	A6
Increase Number and Quality of Students		
• Domestic Ph.D. Students	R,E	A7
○ Include 'Intro to Engineering' for freshmen		
○ Integrate PAs into Research Programs		
○ Promote joint BS-MS Programs		
○ Create graduate summer intern programs		
○ Promote accelerated Ph.D. entry		
○ Encourage Ph.D. coursework program		
○ Recognize completion of comp exam		
• Improve Quality/Retention of UG/GR admissions	E, R	A17
Establish Michigan Engineering Education Research Institute		
	E, TT	A12
• Seminars (talks by industry, at industry)	E, TT	
• Advanced technology workshops	E	A15
Establish the Michigan Applied Research Institute		
	R, E, TT	A11
• Establish the Engineering Research Projects Lab (EIPL)	R, E,TT	A10
• Load Model allowing tech transfer	TT	
• Central Administration (e.g. C&G support)	R,TT	A8
• Space Optimization	R,E,TT	A9
• Undergraduate Research	R,TT	A16
Improve Industry Collaboration and Entrepreneurship		
	TT	
• Industrial projects publicity	TT	
• People-to-people exchanges (e.g. sabbaticals)	TT	
• Faculty development programs	TT,E	A15
• Entrepreneurship in Engrg (UG classes, etc.)	TT,E	A15
• Technology Fairs and Seminars	TT,E	

Appendix

Strengths, Weaknesses, Opportunities, Threats (SWOT) Analysis..... A1

Leadership in Research Thought-Starter Action Plans

- Increase External Funding.....A2
- Increase Centers.....A3
- Increase Core Investment..... A4
- Increase External Recognition (Faculty, Students)..... A5a, A5b
- Improve Research Image.....A6
- Improve Research Culture.....A7
- Improve Research Infrastructure (Central Administration).....A8
- Improve Research Infrastructure (Space).....A9
- Establish and Engineering Research Project Lab (ERPL)..... A10
- Establish the MSU Applied Research Institute.....A11

Leadership in Education Thought-Starter Action Plans

- Establish the MSU Engineering Education Research InstituteA12
- Increase Funding for Education.....A13
- Increase External Recognition for Education.....A14a, A14b
- Improve the Education Culture.....A15
- Improve Education Infrastructure (Undergraduate Research).....A16
- Improve Education Infrastructure (Core Math/Science).....A17

ASEE ExpendituresA18

PhD Student Penetration.....A19

SWOT Analysis

A1

Strengths

- Undergraduate education and residential college
- International experience for undergraduates
- Strategic research centers
- Collaborative activities and opportunities
- Co-location of the engineering faculty
- Success in internal funding with other colleges
- Trends in the last five years
- Improved leadership in the college
- Collaborative opportunities in the College of Agriculture and Natural Resources.

Weaknesses

- Lack of a research hospital (major funding limitation)
- Low ranking of the college
- Decreasing number of graduate students
- Lack of lab space
- Lack of local industry
- Lack of focus from the senior administration
- Need for help with post-award process (better response and organization necessary)
- Need help organizing large centers
- Small college size compared to peers
- Need for more development (endowment, scholarships, fellowships, etc)
- Low proposal submission per faculty (3-4 per year)
- Less state funding than UM and WSU

Opportunities

- Alternative energy
- Sustainable materials
- Homeland security
- Petascale* computing
- Auto industry (not just the Big Three, but all the suppliers and others)
- More agricultural extension
- Internet dissemination

Threats

- Shrinking pool of research funds
- Diversity of research funding
- Volume of proposals submitted to NSF is NOT proportional to the opportunity
- Young faculty turnover
- Too many public institutions in Michigan
- Lack of opportunities for early-career faculty
- Increased endowment at other institutions
- Tuition cost increases

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Research

Champions: Shanker B., Drzal

Strategic Objective: Increase Extramural Funding
Action Plan Item: Increase the \$/FTE by 10% / year

Action Step	Customer(s)/ Audience(s)	Start Date (XQYY)	End Date (AQBB)	Measurable(s)	Responsibility
1. Increase proposal success and number of proposals		4Q08	4Q12		
a. Introductions to program managers	Faculty, Most funding agencies	4Q08	4Q12	Faculty to agency trips OR agency visits to MSU per quarter	Assoc Dean Research/Dept Chair/Faculty
b. Be responsive to RFPs	Faculty	4Q08	4Q12	No of proposals submitted	Faculty; Data-DER
c. Spend time in federal/state/industrial facilities	Faculty, Fed Agency	3Q09	4Q12	No of application/awards	Faculty; Data-DER
d. Collaboration with gov't labs/industry-SBIR,STTR,State	Industry, Fed Agency, Faculty	1Q09	4Q12	No of SBIR/STTR/GOALI proposals/awards	Faculty; Data-DER
e. Collaborative proposals outside disciplinary boundaries	Faculty	1Q10	4Q12	No of proposals with PIs > 1	Faculty; Data-DER
f. 'Technical Workshop' offerings by faculty	Gov't & Industry	3Q09	4Q12	1 per Dept per Year	Faculty, Dept Chair
g. 'Short Course' offering	Gov't & Industry	3Q09	4Q12	1 per Dept per Year	Faculty, Dept Chair
h. 'Testing and Characterization' services	Gov't & Industry	4Q08	4Q12	No. of testing projects per Year	Faculty+Dept

Expected Benefits (\$ and/or other)

Increase in College extramural research funding
 Increase in External Recognition and Reputation for Research
 Increase in Faculty and Graduate Student Quality
 Better placement of Graduate students
 Increase in Intramural funding for research and infrastructure

Required Resources (\$ and/or manhours)

Faculty chair and Dean time;
 Seed funding for workshops and short courses
 Better marketing of faculty members and their research
 Continual help with contracts and grants to facilitate pre- and post-award processing

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Research

Champions: Shanker B., Drzal

Strategic Objective: Increase Extramural Funding

Action Plan Item: Increase Number of Centers – one additional every 3 years & increase in research faculty (5/year)

Action Step	Customer(s)/ Audience(s)	Start Date (XQYY)	End Date (AQBB)	Measurable(s)	Responsibility
Identify multi-disciplinary working groups	Faculty	4Q09	4Q14	Title & keyword description to DER	Faculty/Chair/Dean
Develop reward and recognition program	Faculty	1Q09	2Q09	Faculty Buy-in	Chair/Dean
Identify target resources and three year strategic plan for proposal submission	Dean/Chairs	1Q09	2Q09	No. of three year center development proposals submitted and approved	Faculty Group ; data- DER
Semi-annual management review of center progress	Dean/DeptChairs	3Q09	4Q14	SWOT assessment	Assoc Dean/Chairs
Investment of seed funds to incubate and support the effort	Faculty	3Q09	4Q14	Return on investment/No.of proposals	Dean/Dept Chair
Participate in multi-disciplinary research initiatives (MURIs)	DoD/DOE	1Q09	4Q14	Annual MURI proposals submitted	Faculty; data- DER

Expected Benefits (\$ and/or other)

- Increase in external funding of research centers
- Increase in external recognition and reputation for research
- Increase in faculty and graduate student quality

Required Resources (\$ and/or manhours)

- Time commitment by faculty;
- Dollars from Dean
- Leadership in the administration to form and motivate teams

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Research

Champions: Shanker B., Drzal

Strategic Objective: Increase Extramural Funding
Action Plan Item: Increase Core Investment

Action Step	Customer(s)/ Audience(s)	Start Date (XQYY)	End Date (AQBB)	Measurable(s)	Responsibility
Establish "Research" Professor career track	Postdocs, industry, early retirees, visiting scholars	1Q09	4Q09	Modification of Faculty Handbook and College By-laws	College/University
Five year internal investment funding of ~\$120K/yr/Dept - recruit research professors	Gov't agencies (DoD, DoE, NASA), industry researchers	3Q09	3Q14	R.O.I. threshold*	Dean/University
Faculty management plan for sabbaticals	Peer institutions, AFRL, ARL, Research Labs, Industries	1Q09	2Q09	Dept plans submitted and updated annually	Chairs/Faculty

*Asst Res Prof 100% cost in 4 years
*Assoc Res Prof 150% cost in 4 years
*Research Prof 200% cost in 4 years

Expected Benefits (\$ and/or other)

- Increase in external funding of research centers
- Increase in external recognition and reputation for research
- Increase in faculty and graduate student quality

Required Resources (\$ and/or manhours)

\$720K/year college investment

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Research

Champions: Harichandran, Steffe

Strategic Objective: Increase External Recognition

Action Plan Item: Faculty

Action Step	Customer(s)/ Audience(s)	Start Date (XQYY)	End Date (AQBB)	Measurable(s)	Responsibility
Increase publications in top-tier journals	External Deans, Chairs, Faculty, and Industry	1Q09	4Q12	Rank in the top quartile of peer institutions in journal pubs./FTE for publications in top tier journals	Faculty, Chairs, Dean
- Identify top tier journals by disciplinary area		1Q09	1Q09		
- Establish publication counts per FTE of MSU COE and COE at peer institutions		2Q09	2Q09		
- Create incentives to motivate our faculty to increase publications in top-tier journals		1Q09	2Q09		
Increase presentations at and partnerships with top tier universities	External Deans, Chairs, Faculty, and Industry	1Q09	1Q12	5% annual growth rate in presentations; 5% annual growth rate	Faculty, Chairs, Dean
Increase fellows of professional societies	Society members, and external Deans & Chairs	4Q08	4Q12	Rank in the top quartile of peer institutions for number of fellows	Faculty, Chairs, Dean
Increase external awards, honors & keynote presentations at conferences	External Deans, Chairs, Faculty, and industry	4Q09	4Q12	Rank in the top quartile of peer institutions for number of awards, honors and keynotes per FTE	Faculty, Chairs, Dean
- Increase number of nominations for external awards/honors					

Expected Benefits (\$ and/or other)

Increased visibility of faculty at top tier universities, professional societies and industry.

Required Resources (\$ and/or manhours)

Time of graduate students, faculty, chairs and Dean (with support staff). Financial incentives.

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Research

Champions: Harichandran, Steffe

Strategic Objective: Increase External Recognition

Action Plan Item: Students

<u>Action Step</u>	<u>Customer(s)/ Audience(s)</u>	<u>Start Date (XQYY)</u>	<u>End Date (AQBB)</u>	<u>Measurable(s)</u>	<u>Responsibility</u>
Increase student journal paper submissions, paper presentations at prominent conferences, and student paper awards - Facilitate students to present at prominent conferences - Encourage students to submit papers for awards - Require journal paper submission before graduation	External chairs, industry, present and future faculty	4Q08	4Q12	Demonstrate steady growth rising to target of 100% of PhD students and 50% of MS thesis students over program	Students, faculty
Increase external scholarships and fellowships won by students - Increase number of nominations of students for external scholarships and fellowships	External chairs, industry, present and future faculty	4Q08	4Q12	Demonstrate steady growth rising to target of 20% of graduate students	Students, faculty
Place PhD students as faculty at U.S. universities ranked above MSU, and at top tier universities abroad	External deans, chairs, faculty	4Q09	4Q12	Appropriate metric to be defined	Faculty, chairs

Expected Benefits (\$ and/or other)

Increased visibility of graduate students to top tier universities, professional societies and industry

Required Resources (\$ and/or manhours)

Time of graduate students, and faculty.
 Funds for student travel.

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Research

Champions: Harichandran, Steffe

Strategic Objective: Increase External Recognition

Action Plan Item: Improve Research Image

<u>Action Step</u>	<u>Customer(s)/ Audience(s)</u>	<u>Start Date</u>	<u>End Date</u>	<u>Measurable(s)</u>	<u>Responsibility</u>
Increase the effectiveness of external publicity of research - Assess effectiveness of different publicity efforts such as national press releases, nationally distributed newsletters, nationally distributed electronic publications, publications in popular science magazines, publication of review articles, presentations at national forums, industry research fairs - Increase numbers in selective forums - Increase publications in selective forums	External deans, chairs, faculty, alumni, industry	(XQYY) 4Q08	(AQBB) 4Q12	10% annual growth rate of publications in selective forums	Dean, Chairs, faculty, publications/marketing staff

Expected Benefits (\$ and/or other)
Improve research image

Required Resources (\$ and/or manhours)
Time of Dean, Chairs, faculty and publications/marketing staff. Funds for publications.

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Research

Champions: Radcliffe, Punch

Strategic Objective: Improve Research Culture

Action Plan Item: Improve Student Research Culture

Action Step	Customer(s)/ Audience(s)	Start Date (XQYY)	End Date (AQBB)	Measurable(s)	Responsibility
1) Include "Introduction to MSU Engineering Research" as part of the new freshman course	Engineering freshmen	1Q09	3Q09	UG research participation	EGR 100 Course
2) Integrate Professorial Assistant program into research programs	Engineering PA's	3Q09	1Q10	PA research participation	Undergraduate Studies
3) Promote Engineering joint B.S. – M.S. Programs including a) an integrated M.S. thesis program, b) junior and senior paid research aide positions and c) Summer Undergraduate Research Internship each summer	Engineering juniors and seniors	3Q09	3Q10	BS-MS program participation	Dept Graduate Coordinator
4) Create Graduate Summer Research Internships for May graduates admitted into graduate programs	New engineering Graduate students	1Q09	3Q09	Retention of highest quality students	Spartan Engineering
5) Promote engineering accelerated Ph.D. entry program	Highest quality engineering MS students	1Q09	4Q10	Program participation	Dept graduate coordinators
6) Encourage coursework requirements for PhD students	Engineering PhD students	1Q09	4Q10	Graduate course enrollment	Dept graduate coordinators
7) Recognize completion of comprehensive examination w/ advancement to candidacy	Engineering PhD students	1Q09	4Q10	Mean time to comprehensive exam	Dean's office

Expected Benefits (\$ and/or other)

- Better recruitment of high quality students into MSU engineering programs
- Better recruitment of high quality MSU engineering students into graduate programs
- Better recruitment of high quality MSU engineering MS students into PhD programs
- Better recruitment of high quality MSU engineering MS students into PhD programs
- Higher quality PhD programs and increased graduate course offerings (item 6)

Required Resources (\$ and/or manhours)

- Additional funds for PA's
- Additional funds for Undergraduate Summer Research interns
- Additional funds for Graduate Summer Research interns

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Research

Champions: Jayaraman, Biswas

Strategic Objective: Improve Infrastructure Flexibility and Responsiveness

Action Plan Item: Central Administration

Action Step	Customer(s)/ Audience(s)	Start Date (XQYY)	End Date (AQBB)	Measurable(s)	Responsibility
IP					
1. Institute time table for follow-up of disclosures in IP office	Faculty	1Q09	2Q09	Timetable endorsed	Assoc. Dean, IP Office
2. Institute time table for IP agreements with industry in IP office	Faculty	1Q09	2Q09	Timetable endorsed	Assoc. Dean, IP Office
Contracts and Grants					
1. Improve responsiveness of CGA to demands of grantors	Faculty	2Q09	4Q09	20% time reduction to get the funds after award	Assoc. Dean
2. Allow rental costs of space to be free of indirect costs and make it a separate category	Faculty	4Q08	1Q09	more options for space	Assoc. Dean

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Research

Champions: Jayaraman, Biswas

Strategic Objective: Improve Infrastructure Flexibility and Responsiveness

Action Plan Item: Space

Action Step	Customer(s)/ Audience(s)	Start Date (XQYY)	End Date (AQBB)	Measurable(s)	Responsibility
1. Estimate space needs formally with the announcement of every position				30% reduction in space allocation after new hire arrives	Assoc. Dean for Research
2. Provide additional space that is required for short-term projects with a short planning cycle	New hires and existing faculty			20% improvement in short-term project space allocation	Assoc. Dean for Research
3. Evaluate utilization of space periodically in terms of funding and productivity	Faculty			Students supported over 3 years /sq ft	Assoc. Dean for Research

Expected Benefits (\$ and/or other)

Better utilization of limited resources

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Research

Champions: Jayaraman, Biswas

Strategic Objective: Improve Infrastructure Flexibility and Responsiveness

Action Plan Item: Infrastructure for Engineering Research Projects Laboratory (ERPL)

<u>Action Step</u>	<u>Customer(s)/ Audience(s)</u>	<u>Start Date</u> (XQYY)	<u>End Date</u> (AQBB)	<u>Measurable(s)</u>	<u>Responsibility</u>
1. Allocate <u>reassignable short-term space and staff</u> for engineering research projects Laboratory a. Facilitate quick set-up of specific equipment in additional short term space b. Provide a pool of researchers/technicians for short-term assignments	Faculty	1Q09	3Q09	Flexible space capacity Short time units for staff and/or student salary	Assoc Dean for research

Expected Benefits (\$ and/or other)

We can capitalize on opportunities that will lead to long term beneficial relationships

Required Resources (\$ and/or manhours)

Identify space equivalent to 5% of currently available space for this purpose

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Research

Champions: Jayaraman, Biswas

Strategic Objective: Improve Infrastructure Flexibility and Responsiveness

Action Plan Item: Establish MSU Applied Research Institute (MARI)

<u>Action Step</u>	<u>Customer(s)/ Audience(s)</u>	<u>Start Date (XQYY)</u>	<u>End Date (AQBB)</u>	<u>Measurable(s)</u>	<u>Responsibility</u>
I. Develop the Michigan Applied Research Institute	Industry and other applied research customers	1Q09	2Q10	Institute adopted	Assoc Dean for Research, selected faculty
a. Identify applied research opportunities			2Q09	Feedback from external organizations	Assoc Dean for Research, selected faculty
b. Select external organizations with a stake in the institute			3Q09	Amount of support and thrust	Assoc Dean for Research, selected faculty
c. Assemble core group of faculty to participate in this institute			3Q09	Major thrust area	Dean, Assoc Dean
d. Write a business plan and get buy-in from the MSU Foundation and other private foundations			4Q09	business plan buy-in	Core group
e. Identify essential staff and major equipment requirements for research in the institute			4Q09	Capital required identified	Core group
f. Acquire major equipment pieces with help of university and foundations			1Q10	Capacity established base on number of projects	Core group
g. Organize collaboration and support with external organizations			2Q10	Expanded capacity and recognition	Core group

Expected Benefits (\$ and/or other)

More on-going connections between graduates and university
 More varied research opportunities
 Increased funding from industry and DOD
 More opportunities for PhD graduate placement
 Facilitates Technolgy Transfer to benefit society

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Education

Champions: Chatti, Harichandran, Steffe

Strategic Objective: Establish an MSU Engineering Education Research Institute (MEERI)

Action Plan Item: Develop and Propose Plan for MEERI

<u>Action Step</u>	<u>Customer(s)/ Audience(s)</u>	<u>Start Date (XQYY)</u>	<u>End Date (AQBB)</u>	<u>Measurable(s)</u>	<u>Responsibility</u>
Identify working group and leader (including CoE champions and CoEd faculty interested in collaboration)	Faculty(both CoE and CoEd)	1Q09	2Q09	Working group established with CoE and CoEd faculty buy-in	Assoc Deans, affected faculty
Identify potential partners outside MSU	Industry partners, non-profit education institutions, faculty outside MSU	2Q09	3Q09	Target audience agreement	Working Group
Develop internal strategy for 'seed' funding	MSU central administration, MSU Foundation	2Q09	3Q09	Seed funding approved	Working Group
Identify external funding sources (including CSPACE, other NSF grants)	Department of Education, NSF, foundations and non-profit organizations, industry	4Q09	1Q10	External funding identified	Working Group
Develop, refine concept, propose MEERI plan including: Funding, External Recognition, Culture and Infrastructure	Department of Education, NSF, foundations and non-profit organizations, industry	2Q09	4Q09	Plan Approved and funded, EERI Director named	Working Group
<u>memo:</u> Use ESP Team thought starter Action Plans as resource					
Publicly announce MEERI	Faculty, students, industry, agencies, public		1Q10	Media acknowledges	Deans, MEERI Director

Expected Benefits (\$ and/or other)

MEERI would foster innovative methods and new educational structures (courses, interaction, dissemination) generating a new culture of Engineering education. Furthermore, the Institute would provide linkage to other units within the University including both business and education. The result would be both better quality students and give them an opportunity for lifelong contact with MSU.

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Education

Champions: Shanker B., Drzal

Strategic Objective: Funding for Education

Action Plan Item: Increase Funding for Education

<u>Action Step</u>	<u>Customer(s)/ Audience(s)</u>	<u>Start Date (XQYY)</u>	<u>End Date (AQBB)</u>	<u>Measurable(s)</u>	<u>Responsibility</u>
Increase Graduate Scholarships	Graduate students	1Q09	1Q14		
1. Funding for underrepresented groups (minorities, women and domestic students)				10% annual funding growth rate	Assoc Deans
2. Capital Campaign funding sources				5% year-over-year funding increase	Dean, Central Administration
3. Industrial sponsored funding (fellowships, gifts, and short-term internships)				Secure one additional industry funding source/year/dept	Chairs
Increase Undergraduate Funding	Undergrad students	1Q10	1Q13		
1. Residential College				5% annual funding growth rate	Residential College Director
2. Division of Undergraduate Education in NSF				Source established	Selected faculty
3. NSF REU				Source established	Selected faculty
4. Short-term Industrial Internships				Source established	Selected faculty
Enhance Post-Baccalaureate Funding Opportunities	Working Engr grads	4Q10	4Q14		
1. State funding for Lifelong Learning				Source established	Assoc Deans, selected faculty
2. Industrial sponsorships				Secure one additional industry funding source/year/dept	Assoc Deans, selected faculty

Expected Benefits (\$ and/or other)

Establishes better focus on funding underrepresented graduate groups
 Leverages NSF interest in funding undergraduate programs
 Strengthens connections with working graduate MSU engineers and industry

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Education

Champions: Chatti, Harichandran, Steffe

Strategic Objective: Increase External Recognition

Action Plan Item: Develop Specific Plans for Faculty, Students and Education Image

Action Step	Customer(s)/ <u>Audience(s)</u>	Start <u>Date</u> (XQYY)	End <u>Date</u> (AQBB)	<u>Measurable(s)</u>	<u>Responsibility</u>
Faculty					
1. Increase partnerships with College of Education faculty and others at top tier institutions to secure high profile education related grants that lead to exposure at the national level	General public, media, external Deans, Chairs, faculty	Ongoing	Ongoing	5% annual growth rate in grants, partnerships	<u>Key faculty</u> , Chairs, Dean
2. Increase publications in engineering education (ASEE journal)	External Deans, Chairs, faculty	Ongoing	Ongoing	<u>Top quartile</u> ranking among peer institutions in journal publications/FTE for education-related publications	<u>Key faculty</u> , Chairs, Dean
3. Increase keynote presentations at ASEE conferences	ASEE members, external Deans, Chairs and faculty	Ongoing	Ongoing	<u>Top quartile</u> ranking among peer institutions for keynotes/FTE	<u>Key faculty</u> , Chairs, Dean
4. Increase development of and partnerships in education-related workshops and seminars	External faculty, Chairs, and Deans	1Q09	3Q09	5% growth rate in presentations, partnerships	<u>Key faculty</u> , Chairs, Dean
5. Increase development of 'Web-based' public lectures and seminars	General MSU undergraduate students, students outside MSU, external faculty, Chairs, and Deans	1Q10	1Q11	Complete at least one web-series, web attendance by 4Q11	<u>Key faculty</u> , Chairs, Dean
6. a) Integrate undergraduate research with education through Professorial Assistant programs; b) Develop/increase undergraduate research opportunities through NSF REU, Centers, and summer internships	Students outside MSU, MSU undergrad students, external faculty, industry, chairs, and Deans	2Q09	2Q10	Develop minimum of one Center, 10% growth rate in summer internships	<u>Key faculty</u> , Chairs, Dean
7. Encourage faculty to publish more textbooks (need better faculty incentives)	Students outside MSU, MSU undergrad students	Ongoing	Ongoing	5% per annum growth rate in textbook publications	Faculty, Dean

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Education

Champions: Chatti, Harichandran, Steffe

Strategic Objective: Increase External Recognition

Action Plan Item: Develop Specific Plans for Faculty, Students and Education Image

Action Step	Customer(s)/ Audience(s)	Start Date (XQYY)	End Date (AQBB)	Measurable(s)	Responsibility
Students					
1. Increase graduate/undergraduate student participation in education-related journal submissions, presentations at ASEE conferences, and student paper awards	External chairs, industry, present and future faculty	1Q09	1Q14	5-year target of 50% PhD, 25% MS and 10% Undergraduate student participation	Students, faculty
2. Increase external scholarships and fellowships	External chairs, industry, present and future faculty	2Q09	2Q14	5-year target of 20% graduate student receiving awards	Students, faculty
3. Place PhD students as faculty at U.S. teaching colleges and top-tier universities abroad	External Deans, chairs, faculty	2Q09	2Q11	5% increase in two years	Faculty, Chairs
Image					
1. Further develop Engineering Residential College in terms of participation and retention	Students, external Deans, chairs, faculty	On-going	On-going	% Engineering student participation	Associate Dean, Director and staff
2. Increase effectiveness of external publicity and marketing of education programs	External Deans, chairs, faculty, industry	1Q09	2Q09	10% annual growth rate in publications to 'best leverage' sources	Dean, Chairs, faculty, publications staff
Expected Benefits (\$ and/or other)					
Increased visibility of faculty, student initiatives in education					
Increased visibility of graduate students to teaching colleges, top tier universities, professional societies and industry					
Improved education image					
Required Resources (\$ and/or manhours)					
Time of key education scholars within COE, graduate, undergraduate students, faculty, chairs and Dean (with support staff).					
Financial incentives. Funds for student travel. Funds for publications.					

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadership in Education

Champions: Radcliffe, Punch

Strategic Objective: Improve Educational Culture

Action Plan Item: Develop Specific Plans to Enhance the CoE Educational Culture

Action Step	Customer(s)/ Audience(s)	Start Date (XQYY)	End Date (AQBB)	Measurable(s)	Responsibility
Develop Advanced Technology Workshops to share and apply developing engineering concepts and methods	MSU graduates, industry	1Q09	4Q14	2 workshops per year minimum	Selected faculty
Create Faculty Development Programs to aid junior faculty with teaching skills and delivery methods	Junior faculty	3Q09	4Q10	Program implemented no later than 2010	Assoc. Deans, selected faculty
Emphasize Entrepreneurship/Business skills for both undergraduate and graduate students	Students	4Q09	4Q10	Expanded program planned, implemented before 2011	Assoc. Deans, Business School faculty
Improve Quality of Student Admissions and Connections for Retention (Grad, Undergrad)	Students	4Q09	4Q11	20% ACT score improvement admitting scores by 2011, 5% retention improvement year over year	Assoc. Dean, Director of Residential College

Expected Benefits (\$ and/or other)

Better linkages with industry and MSU graduate engineers
 Enhanced skills transfer to junior faculty
 Better appreciation for business skills to enhance business new technology start-ups

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leader in Education

Champions: Jayaraman, Biswas

Strategic Objective: Improve Infrastructure for Education

Action Plan Item: Undergraduate Research

Action Step	Customer(s)/ Audience(s)	Start Date (XQYY)	End Date (AQBB)	Measurable(s)	Responsibility
Develop cooperative program with industry or agencies for undergraduate research	UG students	2Q09	3Q10	Program established/first competition complete	Assoc. Dean of Research
a. Provide expanded choices to undergraduates for projects	UG students	3Q09	2Q10	Quality of student papers	Assoc. Dean of Research
b. Recruit companies for participating in UG research projects	UG students	2Q09	1Q10	5% increase/year	Assoc. Dean of Research
c. Run competitions for UG research project presentations	UG students	1Q10	3Q10	Quality of student papers	Assoc. Dean of Research
d. Provide load incentives to faculty for UG research projects	Faculty	2Q09	1Q10	Load incentives established	Dean, Assoc. Dean of Research
e. Encourage publications by undergraduates	UG students	Ongoing	Ongoing	5% increase/year	Assoc. Dean of Research

Expected Benefits (\$ and/or other)

Greatly enhance the undergraduate learning experience
Give industry early evaluation of student potential for employment potential

Action Plan/Action Steps

Key Strategic Issue (KSI): Recognized Leadship in Education

Champions: Jayaraman, Biswas

Strategic Objective: Improve Educational Infrastructure and Responsiveness

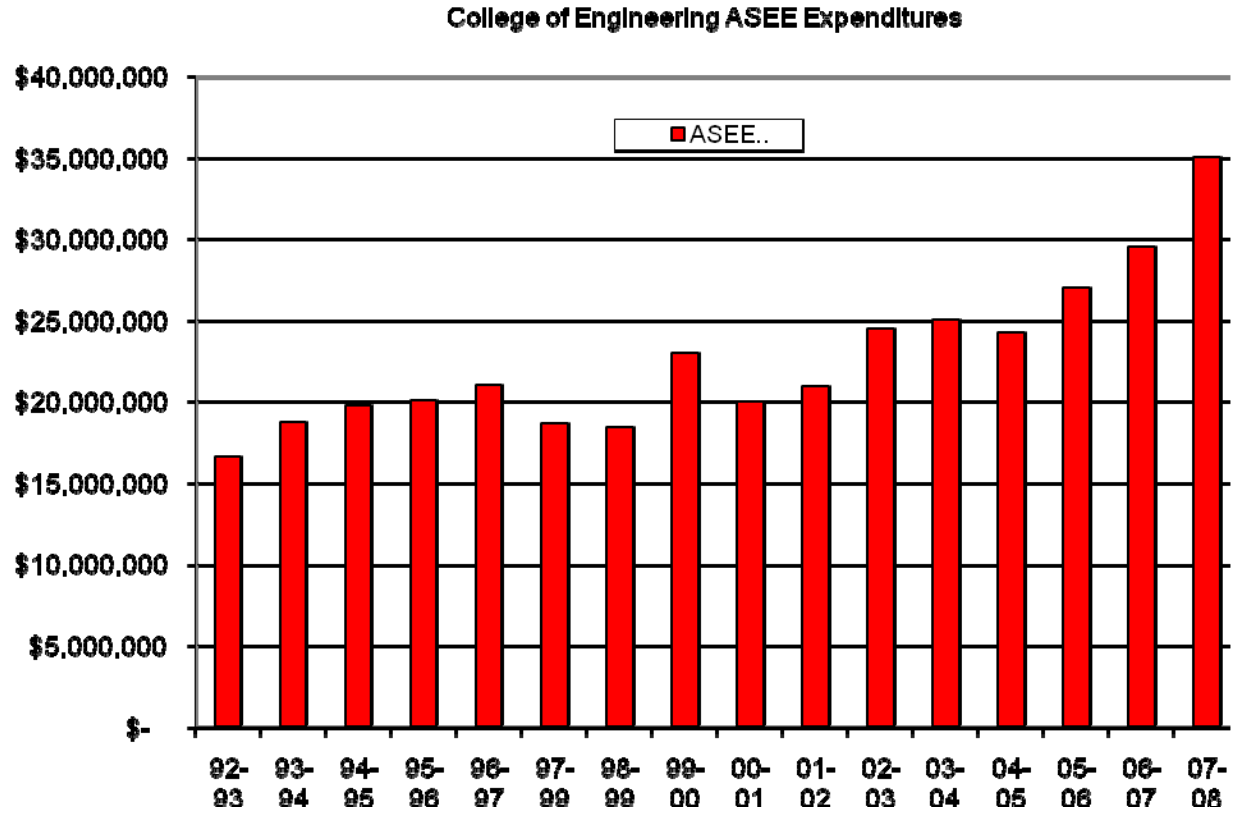
Action Plan Item: Improve retention/ application of core Math/Science requirements

Action Step	Customer(s)/ Audience(s)	Start Date (XQYY)	End Date (AQBB)	Measurable(s)	Responsibility
1. Evaluate retention of required math/science content	UG students			Development of metric	Assoc. Dean, selected faculty
2. Develop a plan for improving retention and application skill	UG students			Adopt plan	Dean
3. Implement the plan	UG students			New value of metric	Assoc. Deans

Expected Benefits (\$ and/or other)

Enhance retention of core math/science content for later application
 Improve communications with MSU math and science departments
 Strengthen Engineering faculty dialogue with freshmen and sophomores

College of Engineering ASEE Expenditures



PhD Student Penetration in the College of Engineering

