

Institute for Leadership and Innovation

Annual Report
July 2010 – June 2011

Introduction:

The Institute for Interdisciplinary Studies (IIS) was formed in 2006 by acting Provost Dave Reed with approval from the Deans' Council to initially house the Enterprise Program and the new leadership initiative. It was formally recognized as a research institute at Michigan Tech in fall 2008. Faculty and staff from across disciplines at Michigan Tech, acting under the auspices of IIS, began working on problems requiring an interdisciplinary approach and received funding awards to support their research and educational programs. The designation of IIS as an Institute at Michigan Tech was a formal recognition of the excellence resulting from faculty and staff who work in and with IIS.

Interdisciplinary research, education, and scholarship are becoming the norm and not the exception in academia. Funding opportunities increasingly emphasize the need to involve an interdisciplinary mix of faculty and students. Students with an interdisciplinary background are better prepared for and more marketable to industry. A global academic and industry environment increasingly requires graduates with interdisciplinary training and experiences. Yet, while interdisciplinary programs existed at Michigan Tech, there previously was not a recognized unit on campus whose purpose and mission was to identify interdisciplinary research, education, and scholarship opportunities; to promote these opportunities; to bring together the individuals and disciplines with the expertise to successfully design, nurture and help implement interdisciplinary programs and activities; and to provide interdisciplinary program evaluation and assessment results. The mission and purpose of IIS filled this need.

After much consideration, it was decided that the name "Institute for Leadership and Innovation" (ILI) better reflects the purpose and goals of the Institute than the former name "Institute for Interdisciplinary Studies." While we remain dedicated to providing students with opportunities to learn experientially on interdisciplinary teams, the new name incorporates our goal of providing students with programs that encourage creative thinking, exploration, entrepreneurship, and leadership.

Teaching

Enterprise project and module courses and Pavlis seminar and practicum courses are scheduled through ILI. On average, almost 800 students participate in Enterprise course offerings each year. The Pavlis Leadership program was piloted in 2006-07 with 7 students and managed program growth should result in 80 student participants in the next few years.

Courses	2007-2008		2008-2009		2009-2010		2010-2011	
	Enrollment	Student Credit Hours	Enrollment	Student Credit Hours	Enrollment	Student Credit Hours	Enrollment	Student Credit Hours
Enterprise	848	2542	819	2542	762	2222	728	1872
Pavlis Institute	28	87	44	204	50	250	51	335
TOTAL	876	2629	905	2799	812	2472	779	2207

Research Funding

The Institute for Leadership and Innovation has actively engaged in securing external funding in support of its programs. Awards and expenditures for the past few years are listed below.

Award	2007-08 Award	2007-08 Expenditures	2008-09 Award	2008-09 Expenditures	2009-10 Award	2009-10 Expenditures	2010-11 Award	2010-11 Expenditures
AT&T Foundation			\$25,000	\$25,000				
NSF IEECI Strategic Supply Chain Partnership: High School Enterprise			\$99,657	\$88,820		\$10,837		
NSF IEECI Assessing Impact of Teaching, Advising and Mentoring on Students in Enterprise			\$95,634	\$16,700		\$66,500		\$12,434
NSF ITEST			\$500,000	\$33,384	\$500,000	\$376,969	\$500,000	\$388,247
NSF CCLI Phase II			\$95,000	\$3,175		\$9,000		\$40,619
Denso North America	\$25,000	\$25,000	\$28,000	\$28,000				
NSF Partnerships for Innovation Universidad del Turabo Partnership for Innovation: Hispanic Entrepreneurial Program for Innovation	\$24,905	\$24,905	\$24,905	\$24,905	\$24,905	\$24,905		
Wireless Integrated Microsystems (WIMS)	\$591,248	\$524,036	\$426,218	\$501,914	\$332,564	\$398,232		
Ford College Community Challenge Harnessing Generations of Energy to Build a Sustainable Community			\$50,000	Begins 9/ 09		\$50,000		
IBM Corporation					\$7,500	\$7,500	\$7,500	\$7,500
IBM Corporation					\$5,000	Begins 9/10		\$5,000
McAllister Foundation			\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
Heyer America					\$15,000	\$3,980		\$4,468

With the integration of CenTILE into ILI, several grants in support of their programs also come under the umbrella of ILI. The table below describes these projects.

Former CenTILE Grants	Amount	Purpose
Michigan Initiative for Innovation & Entrepreneurship (MIE)	\$40,000	Elevator Pitch Competition Business Plan Competition Entrepreneurial Speaker Series Extreme Entrepreneurship Tour
MIE grant	\$35,000	Fund the creation of a student-run company to provide market research services for the local area
Michigan Universities Commercialization Initiative (MUCI)	\$10,000	Salaries for students working on the CPR Mattress Project
MUCI grant	\$23,400	Set up a student-run company to commercialize the CPR Mattress

In addition to the above funding, project sponsorships have been secured from outside sources by Rick Berkey to cover Enterprise and Senior Design projects for departments other than ILI and are not included in the above tables.

A. Enterprise team funding secured for the 2010-2011 academic year from gifts, grants and sponsored projects was approximately \$568,000. In addition, we are in the second year of a \$200,000, 2-year NSF NUE grant to implement the new NanoTechnology Enterprise.

B. Senior Design Project Sponsorships

ILI secures industry sponsored projects for the Departments of Biomedical Engineering, Electrical/Computer Engineering, and Materials Science & Engineering.

2008-2009 Summary: \$211,101 / 16 projects

2009-2010 Summary: \$202,000 / 12 projects

2010-2011 Summary: \$214,000 / 13 projects

Publications

Doug Oppliger, Mary Raber, Robert Warrington, "Engineering Enterprise Alliance: A K-12, University and Industry Initiative to Create a Pathway to Engineering and Science Careers", Proceedings of the American Society for Engineering Education Annual Conference, June 2007, Honolulu, HI, CD-ROM

James Baker, Rick Berkey, and Mary Raber, "Welcome to the Real World" – Balancing Practical, Legal and Educational Issues in Implementing Industrial Sponsored Student Design Experiences', Proceedings of ASEE 2007 Annual Conference and Exposition.

E. Romero, T. Galchev, E. Aktakka, N. Ghafouri, H. Kim, M. Neuman; K. Najafi, R. Warrington, "Micro energy scavengers", Electronic Proceedings COMS 2008, pp.1-8, Sep. 2008, Puerto Vallarta, México, "Best Paper Award". (Oral Presentation)

Doug Oppliger, Dennis Harbour and Robert Warrington. Michigan Technological University Introduces High School Enterprise. Michigan Association of School Administrators, January, 2009, Kalamazoo, MI.

Valorie Troesch, J. Kampe, D. Oppliger, R. Warrington, M. Raber and A. Warrington. "High School Enterprise: Increasing STEM Enrollment" WEPAN Annual Conference, June 2009, Austin, Texas.

Edwar Romero, Michael R. Neuman, Robert O. Warrington, Energy Harvesters for Biomedical Applications, Proceedings of 8th International Workshop on High Aspect Ratio Micro Structure Technology, HARMST 2009, June 2009, Saskatoon.

Edwar Romero, Michael R. Neuman, Robert O. Warrington, Passive Energy Harvesting from Human Activities, Proceedings of the ASME 3rd International Conference on Energy Sustainability, ES 2009, pp. 1-8, July 2009, San Francisco, USA. (Oral Presentation).

Robert Warrington. "Building a Network for Coordination of Service Learning Projects Abroad." 2009 Annual EPICS Conference, August 3-4, 2009, Austin, TX.

E. Romero, R.O. Warrington and M.R. Neuman, The Use of Body Motion for Powering Biomedical Devices, Proceedings of Medical Physics and Biomedical Engineering World Congress 2009, pp. 253-256, Sep. 2009, Munich, Germany. (Oral Presentation)

Edwar Romero, Robert O. Warrington, and Michael R. Neuman, Body Motion for Powering Biomedical Devices, Proceedings of 31st Annual International Conference of the IEEE Engineering in Medicine and Biological Society, pp. 2752-2755, Sep. 2009, Minneapolis, USA.

E. Romero, M.R. Neuman and R.O. Warrington, Kinetic Energy Harvester for Body Motion, Proceedings PowerMEMS 2009, pp. 237-240, Dec. 2009, Washington DC, USA.

E. Romero, R. O. Warrington and M. R. Neuman, Energy scavenging sources for biomedical sensors, *Physiol. Meas.* 30 (2009) R35-R62.

Edwar Romero, Robert O. Warrington, and Michael R. Neuman, Powering Biomedical Devices with Body Motion, Proceedings of 32nd Annual International Conference of the IEEE Engineering in Medicine and Biological Society, Sept. 2010, Buenos Aires, Argentina, pp. 3747-3750. (Oral Presentation)

E. Romero, M.R. Neuman, R.O. Warrington, Rotational Energy Harvester for Body Motion, MEMS 2011, Jan. 2011, Cancun, Mexico.