

Western Upper Peninsula Center for Science, Mathematics and Environmental Education 2006-2007 Annual Report

The Western Upper Peninsula Center for Science, Mathematics and Environmental Education provides services to 19 school districts and their communities in Baraga, Keweenaw, Houghton, Ontonagon, and Gogebic counties. The Center strives to develop scientifically literate and environmentally committed citizens, scientists and community leaders for the 21st century by providing innovative and quality programming for students, teachers and the community.

Overview of the Year's Accomplishments

Implementing and Modeling Proper Chemical Use in Rural Communities

This initiative created a comprehensive chemical management system in school districts to meet OSHA standards. Eleven districts and their chemistry teachers participated in this initiative. The initiatives goals for each participating district were:

- Create an electronic inventory of all chemicals used for instruction.
- Create a complete Materials Safety Data Sheet library of all chemicals in the inventory.
- Create a secure designated chemical storage area.
- Participate in a coordinated hazardous waste pick-up with Michigan Technological University (MTU).
- Inform teachers and district staff of correct chemical hygiene and handling.
- Support and mentor teachers on green chemistry practices.

This initiative was funded by a grant from Department of Environmental Quality Pollution Prevention Program.

Lake Superior Research Program

This program provided field trips to local high schools on the MTU research vessel Agassiz to perform limnological research with practicing scientists from MTU. The students measured physical, chemical and biological parameters of Portage Lake and Lake Superior in order to assess lake health. This program was funded in part by a grant from Michigan Space Grant Consortium.

Space TiViTz Program

Space TiViTz is a challenging, patented math and strategy game for students in grades 4-8 endorsed by NASA. This program started with a workshop for teachers in November on how to use Space TiViTz games to develop and hone students' mathematics and problem solving skills. Participating teachers received a classroom set of TiViTz games to use. In May, teachers and students participated in a TiViTz tournament held at Michigan Technological University. Dr. Kathryn Clark, former Chief Scientist of Human Space Flight for NASA and Vice President at TiViTz, served as the Master of Ceremonies and presented the awards. The TiViTz program was funded by a grant from the Michigan Space Grant Consortium.

Environmental Programs for Community and Families

The Western UP Center collaborated with the Michigan Nature Association (MNA) to conduct a Community Field Trip at Robert T. Brown Sanctuary on September 30 and the Family Outdoors Weekend in Keweenaw on October 7-8, 2006. Families had the opportunity to visit five MNA sanctuaries in Houghton and Keweenaw Counties during these events and participate in hands-on activities at each site.

The Western UP Center, in collaboration with various MTU faculty and community members, conducted six community presentations that focused on the unique cultural and environmental aspects of the Great Lakes. These community presentations were conducted at the Portage Lake Library from 6-8 p.m. and made possible by funding from the Wege Foundation and the Great Lakes Maritime Research Institute.

Organization of the Report

The Strategic Plan identifies six service areas: Leadership, Professional Development, Student Services, Curriculum Support, Community Involvement, and Resource Clearinghouse. This report will focus on Professional Development and Student Services for the entire service area. In addition, there will be narrative targeting work done with underachieving schools in the area.

REGION-WIDE PROFESSIONAL DEVELOPMENT

Goal: For educators who participate in Center Professional Development to reflect best instructional practices in their own settings.

Who participated?

Professional development opportunities were provided for classroom teachers, classroom support staff, administrators, parents/community members, and others involved in K-12 education. The chart and summary descriptions show who participated.

Table 1: Participants Receiving Professional Development

Participants			Reported Gender		Position					
			M	F	Admin	Math Tchr	Sci Tchr	Tech	Comb Subj	Other or Unknown*
Pre-School	1	55	0	1	0	0	0	0	0	1
Elementary	68	1113	14	54	0	0	1	0	64	3
Middle/Jr. High	44	1196	14	30	0	6	25	0	4	9
High School	98	2229.5	42	56	5	27	37	3	4	22
K-12 Mixed Levels	54	1064.5	27	27	5	10	14	0	11	14
Other	7	209.5	1	5	0	0	0	0	0	7
Total	272	5867.5	98	173	10	43	77	3	83	56

* Other includes persons who work across levels, are not teachers or administrators, or did not indicate position.

Professional development was delivered in many ways, depending upon the identified needs. Two primary formats included: (1) **Single events**, lasting for a portion of one day to several consecutive days, focused on a particular topic, skill, or issue; and (2) **Series**, which were a series of sessions (each building on the previous and conducted periodically over a several week/month period). The goal was to systematically strengthen teaching practices based on local needs and current research. Table 2 on the following page represents a picture of the number of sessions offered and the rate of attendance.

Teachers, on average, spent 21.6 hours on mathematics, science, or technology professional development.

Table 2: Professional Development Activities

		Math	Science	Other	Total
Elementary & Jr. High	Events	1	9	0	10
	Hours	3	47	0	69
	# Participants	16	101	0	65
Middle School	Events	2	1	0	3
	Hours	12	3	0	15
	# Participants	35	12	0	47
Jr. High & High School	Events	7	1	1	9
	Hours	80	20	5	105
	# Participants	70	13	10	93
High School	Events	5	3	8	16
	Hours	102	12	25.5	139.5
	# Participants	32	31	74	137
K-12 Mixed Levels	Events	0	0	4	4
	Hours	0	0	180	180
	# Participants	0	0	66	66
Total	Events	15	14	13	42
	Hours	197	82	210.5	489.5
	# Participants	153	157	150	460

Spotlight on Partnerships

The Western UP Center is a partnership of the Copper Country ISD, Gogebic-Ontonagon ISD and Michigan Technological University (MTU). Staff spent considerable time fostering a wide variety of partnerships to provide quality programming to the 19 school districts in the service area. These partnerships are crucial to the continued operation of the Center. The Center collaborated with various entities to submit six grant proposals to maintain math and science programs for the 2007-08 school year. The Center collaborated with faculty at MTU, Boston Museum of Science, American Society for Engineering Education, and the Foundation for Family Science to submit a proposal to the National Science Foundation (NSF) for a Family Engineering Program. The Center also collaborated with faculty at MTU to submit another grant to NSF for the Global Watershed Project. The Center brought together businesses, community organizations and MTU faculty to successfully receive funding from Great Lakes Fishery Trust to plan the Lake Superior Stewardship Initiative, which will engage schools and their communities in place-based learning opportunities.

Students and faculty from MTU and Finlandia University provide a tremendous volunteer resource for conducting student programs such as Western UP Science Festival, TiViTz tournament, family science nights, and community programs. In addition, the expertise of MTU faculty is a crucial component to the success of the Center's summer institute program. Staff works closely with MTU faculty to provide the teachers with relevant ways to present cutting edge technology to their students.

Spotlight on Professional Development

Building Bridges Mathematics

The Building Bridges project is in the final year of a two-year program continued to provide comprehensive professional development to secondary math teachers.

Teachers participated in a comprehensive series of workshops focusing on lesson study and summer institutes aimed at improving content knowledge and instructional practice. This project was funded by a Mathematics and Science Partnership Grant.

Educator's Professional Development Institute Series –Developing Algebraic Thinking

This two-year professional development program focuses on helping middle school mathematics teachers implement the Grade Level Content Expectations in algebra and engage students in meaningful problem solving activities. Teachers participate in school year workshops focused on building knowledge of the grade level content expectations and strategies to engage all students in learning. During the summer, teachers participated in an intensive one-week institute to strengthen their knowledge of linear functions and learned how to engage students in relevant mathematical tasks.

Educator's Professional Development Institute Series -Statistics and Probability

This two-year professional development program focuses on helping high school mathematics teachers implement the High School Content Expectations in Algebra I and Algebra 2 pertaining to statistics and probability. Teachers participate in school year workshops that build knowledge of the high school content expectations and strategies to engage all students in learning. During the summer, teachers participated in an intensive two-week institute to strengthen their mathematics content knowledge of statistics and probability.

Using Manipulatives to Teach Algebra

This program consisted of two workshops focusing on how to use manipulatives such as Algeblocks and algebra tiles to address Grade Level Content Expectations in grades 6-8 and teach basic algebraic concepts. Participating teachers received classroom sets of Algeblocks and algebra tiles to implement what they learned.

Summer Institutes

The Western UP Center provided high quality teacher institutes that allowed teachers to improve the teaching and learning that occurs in their classroom. Participants received graduate credit from MTU at greatly reduced rates due to various grants. The institutes were funded with grants from Great Lakes Maritime Research Institute, National Science Foundation and U.S. Environmental Protection Agency.

Institutes conducted:

Winter Ecology Institute- February 2-4, 2006

Global Change-July 17-21, 2006 and June 25-29, 2007

Great Lakes Maritime Transportation-July 24-28, 2006 and July 30-August 4, 2006

Student Services

Student services are delivered based on identified needs to improve and enhance mathematics and science education. Students who participate in enrichment activities have the opportunity to explore new concepts, develop process skills, cooperate on group tasks, and discuss their findings. Student services include:

- ❖ Family Science and Math Nights
- ❖ After-school enrichment opportunities that engage students in the practical application of mathematics and science knowledge
- ❖ Field trips to natural areas to promote environmental stewardship
- ❖ Science fairs and TiViTz tournament

Table 3: Student Services Activities Provided in 2006-2007

		Math	Science	Total
Elementary	Events	2	149	151
	Hours	9	255.5	264.5
	# Participants	12	4496	4508
Elementary & Jr. High	Events	1	25	26
	Hours	3.5	35	38.5
	# Participants	260	843	1103
Middle School	Events	0	12	12
	Hours	0	32	32
	# Participants	0	742	742
Jr. High & High School	Events	0	5	5
	Hours	0	21	21
	# Participants	0	195	195
High School	Events	0	5	5
	Hours	0	10	10
	# Participants	0	1425	1425
K-12 Mixed Levels	Events	1	4	5
	Hours	1	14	15
	# Participants	75	771	846
Total	Events	4	200	204
	Hours	13.5	367.5	381
	# Participants	347	8472	8819

Spotlight on High-Priority Schools

Thirteen of nineteen districts in the Western UP Center's service area made AYP for the 2006. Baraga High School did not make AYP in mathematics and ELA. Five districts at the high school level did not make AYP for first time due to their special education subgroup. Teachers and administrators from these districts attended the professional development offered by the Center that helped school districts meet the federal and state mandates and improve teaching and learning. The Center offered high quality professional development that addressed these mandates:

- *High School Reform.* Multiple workshops were conducted at various locations to inform teachers and administrators about High School Graduation Requirements, and High School Content Expectations. A comprehensive two-day workshop was held to provide teachers with strategies to help prepare all students for the Michigan Merit Exam.
- *New Teacher Mentor Workshop Series.* A series of seven workshops provided new teachers and their mentors with the resources and knowledge to help new teachers create an effective learning experience for their students. This professional development helped teachers and their districts meet the professional development requirement for new teachers.
- *School Improvement Workshop Series.* A series of three workshops guided administrators and school improvement teams on the new School Improvement Framework and rubrics. The Center provided assistance to districts on how to complete the rubrics for ED YES.
- *SIG AYP Mathematics Grant Application.* The Western UP Center collaborated with the other four math and science centers in the Upper Peninsula to secure grants funds to provide comprehensive professional development to special education and general education teachers at the middle school level for the 2007-08 school year.

What was the impact of the Western Upper Peninsula Center for Science, Mathematics and Environmental Education?

Impact on Students	Impact on Teachers
<p>Fourth grade teacher who used the TiViTz games as part of their curriculum had an increase in their Math MEAP scores from Fall of 2005 to Fall of 2006 ranging from 2.5% to 11.4%.</p> <p>Four dozen university students from MTU and Finlandia University conducting programs for K-12 students and served as excellent role models for the younger students.</p>	<p>Teachers that participated in the HS-MASS workshop series indicated that they had more confidence in the strategies they could use to prepare their students for the Michigan Merit Exam.</p> <p>Teachers that participated in the Western UP Center's professional development found the experiences relevant to their classroom practice as indicated by their comments:</p> <ul style="list-style-type: none"> • All parts of the Forestry Institute gave me ideas and inspiration. Really amazing one week learning on so many levels. Well done!!! • I found a treasure trove of interesting, exciting material to share with my students in this workshop. This was a fascinating evening, an outstanding opportunity to connect with a cutting-edge scientist. • I learned things that I can use immediately in my classroom.
Impact on Communities	Impact on Schools
<p>The Western UP Center brought together community organizations, businesses, higher education and schools for the first time to secure funding from the Great Lakes Fishery Trust for stewardship projects pertaining to the Lake Superior Watershed.</p> <p>The Western UP Center worked with the International Association for Great Lakes Research to publish a fact sheet for communities and decision-makers titled "<i>The Great Lakes—At A Crossroads.</i>"</p>	<p>The schools in the region have come to depend on the Center to provide student programming that enhances their science and math curriculum.</p> <p>Many schools were willing to pay for the high quality programming that the Western UP Center offers.</p> <p>Schools depend on the Center to provide high quality professional development in math, science, school improvement and new teacher training.</p> <p>Schools depend on the Center to provide high quality mathematics and science enrichment activities for students that would otherwise not be possible due to school budgets:</p> <ul style="list-style-type: none"> • Afterschool Classes • Ecology Field Trips • Family Science and Math Nights • Western UP Science Fair • TiViTz Tournament

Director's 2006-2007 Budget Discussion

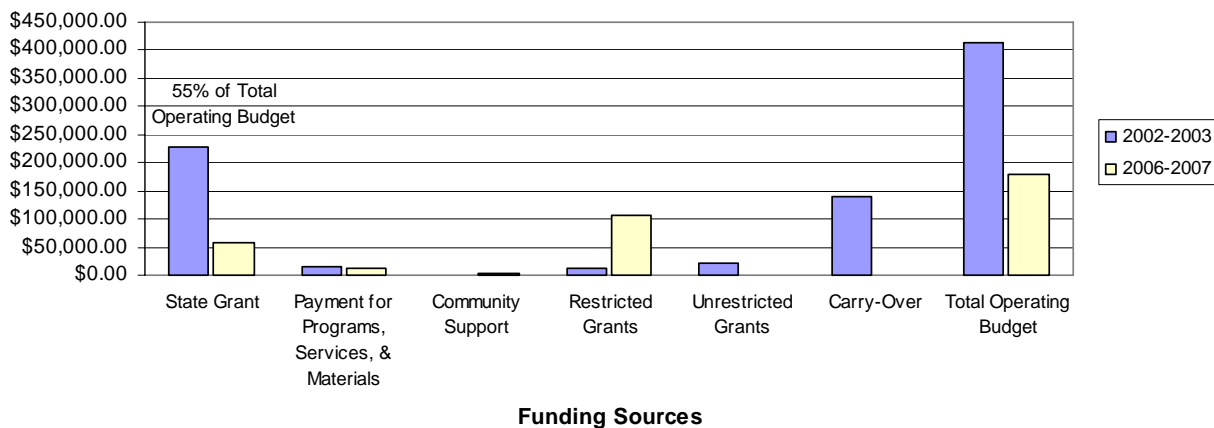
The Western UP Center provided a wide variety of student programs and professional development opportunities by combining funds from Section 99 with seven other restricted grants during the 2006-07 school year. The Section 99 allocation to the Center does not provide enough funding for the salary for one full time person and maintain programming. As in previous years, Center staff was very aggressive in pursuing other grant funds to maintain programming and staff for the 2006-2007 school year. A substantial amount of staff time was spent pursuing grant opportunities and collaborative partnerships.

The school districts in the CCISD and GOISD paid a minimal fee for student and family programs offered through the Western UP Center in the 2006-2007 school year. The fee paid for materials and travel but did not pay for staff time. These programs are valued by the school districts and they are willing to pay the fees even in atmosphere of reduced school budgets.

Funding for the 2007-08 school year remains uncertain at this time. Since Section 99 funding remains at 25% of full funding, a majority of the Center's operating budget is based on grant monies. Six of the seven restricted grants that funded 2006-07 programming have ended. The Center is awaiting notification on five pending grant applications. The Center did receive foundation funding for five years for the Forest Field Trip program. This will allow the Center to employ a forest field trip educator and conduct field trips at schools.

The biggest challenge during the 2007-08 school year will be to maintain teacher and student programming that schools depend on, when funding for the Center is so uncertain. School districts' budgets in the Center's service area are very tight and they will probably be able to continue to pay a minimal fee for programs. This minimal fee does not cover staff time to run these programs. The Center will greatly reduce the family science and after school science programs due to lack of adequate funding.

Changes in the Western Upper Peninsula Center's Financial Support



In addition to the financial support illustrated in the graph above, "in-kind" services received by the Center (donated volunteer time, facilities and equipment) were valued at \$22,700.

Director's Summary 2006-2007

The staff at the Western UP Center for Science, Mathematics and Environmental Education have a firm commitment to continue to provide quality programming that addresses the needs of school districts in their service area. Section 99 does not provide adequate funding to provide this programming. The Center spent a substantial amount of time cultivating partnerships and pursuing grant opportunities to provide programming during the 2006-07 school year and into the 2007-08 school year. The Center received \$107,545 in grant and foundation funding to combine with Section 99 funding for the 2006-07 school year. Six of the seven restricted grants that funded 2006-07 programming have ended and the Center is awaiting notification on five pending grant applications.

The focus of the Center's professional development programs was to provide resources and assistance to teachers as they implement the new Grade Level or High School Content Expectations in their classroom. The Center, in collaboration with MTU, currently has three Teacher Quality Grants to offer comprehensive professional development in middle and high school mathematics over a two-year period. The Center conducted the HS-MASS four workshop series at two locations, Copper Country ISD and the Gogebic-Ontonagon ISD. Participating teachers indicated that they had more confidence in the strategies they could use to prepare their students for the Michigan Merit Exam.

The decreased funding through Section 99 had a profound effect on the student programming that the Western UP Center provides. Before the funding issues, the Western UP Center provided student programming to all districts in their service area at no cost. Most of the student programming was done at the school site. Staff or volunteers would drive to schools to conduct field trips, after school science, family programs, etc. With the decrease in funding, the Western UP Center put an emphasis on professional development and selected student programs to help districts meet state and federal mandates. The expensive student programs, such as after school science and family science nights, were delivered to those schools that could pay part of the cost. Many schools are willing to pay the cost of these programs, but many districts are feeling budget shortfalls and could not purchase the programs. The Center did receive foundation funding to maintain the forest field trip program for five years. This program provides field experiences at the school site to enhance the curriculum taught in the classroom.

The Western UP Center staff decreased from five full time employees to three full time employees and one part time employee due to budget cuts. One of the full time employees is an Ameri-Corp worker that costs the Western UP Center \$6700 annually. The governance of the Western UP Center has remained the same. The Center is a partnership of the Copper Country Intermediate School District (CCISD), Gogebic Ontonagon Intermediate School District (GOISD), and Michigan Technological University (MTU), and provides services to schools in the CCISD and GOISD. The CCISD acts as the fiscal agent and the CCISD Board of Education reviews fiscal records.