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**Dedicated to Improving
Mathematics, Science and
Technology
Education through:**

- Teacher support
- Enhanced employability
- Curriculum development
- Applied R&D
- Assessment
- Partnerships

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College Mathematics Project - Receives Funding

The College Mathematics Project (CMP) has received funding from the School/College/Work Initiative (SCWI) to support the next phase of the project. The Pilot B project, involving six colleges (Sheridan, Georgian, George Brown, St. Clair, Fanshawe and Seneca) and nine partner schools boards will examine the patterns of mathematics preparation at the secondary school level associated with success in first year college technology mathematics. A qualitative study, conducted by Trish Byers, a professor of mathematics at Georgian College will examine participating college policies, programs, subject outlines and institutional assessment tools to provide context for the quantitative study, which will involve approximately 4000 student records. A feasibility study, conducted by YSIMSTE Co-director Dr. Graham Orpwood will determine the potential for expansion of CMP to include all colleges of applied arts and technology will form the final part of the project. A communications plan involving presentations to colleges, school boards, a SCWI regional forum, web presence and presentations at conferences and symposia will build awareness about the project and begin the dialogue between government, schools and board, and colleges to improve student success.

The Seneca led project builds on the Pilot A study which involved an examination of approximately 600 student records in selected schools in Seneca's Faculty of Applied Science and Engineering Technology. The results of Pilot A were presented at the OAME –Nexus 2005 conference held at York University in May 2005.

A CMP Steering Committee meeting was held at Seneca College on September 29, 2005. Members of the steering committee will advise the project team

on key student data analysis questions and will provide information to support the qualitative study. We plan to launch a website on the project shortly. Please contact Laurel Schollen at 416.491.5050 extension 3775 for more information on the College Mathematics Project.

Supporting School Improvement (SSI)

Improvement is the goal of all education. Teachers aim to help students increase their knowledge and skills. Administrators want to see the results for their schools improve. And politicians and ministry officials watch the annual reports of EQAO with interest to see if there has been discernible improvement in achievement overall. Indeed, the Government has mandated that improvement planning be an annual requirement both for schools and school boards.

Yet despite this explicit focus on improvement as a goal for educators, there has been little work done in Ontario to date on using the EQAO achievement data for the purposes of *measuring* improvement, either at school or school board levels. In its most recent reports, EQAO has begun to report provincial and board achievement over time but relatively little research or debate has taken place into the methodologies involved and little comparative analysis of boards or schools has taken place.

This need for research into measuring improvement provided the basis for a research program initiated in 2004 at the York/Seneca Institute for Mathematics, Science and Technology Education (YSIMSTE) under the general title of *Supporting School Improvement*. The first project undertaken within this program was the development and testing of a set of three analytical tools for use in measuring improvement at school and board levels. These tools – Weighted Average Achievement (WAA), Improvement Index (II), and Cohort Growth (CG) – can be applied to the measurement of improvement in achievement in any Ontario assessment but, for our initial work, we have focused exclusively on the provincial Reading, Writing and Mathematics assessment in Grades 3 and 6.

To date, we have developed a report for the Literacy and Numeracy Secretariat of the Ontario Ministry of Education that uses these tools to review improvement at the School Board level. Next we are embarking on research with the Simcoe-Muskoka Catholic DSB and the Greater Essex County DSB to review school-level improvement in mathematics and to learn more about the factors associated with such improvement. The SSI group is open to working with any school board in Ontario to identify school improvement within their jurisdiction. For further information on the SSI project, please contact Dr. Graham Orpwood at 416.736.5269.

Summer Science and Technology Project 2005

By Jane Kennedy, YSSSTP Coordinator

In 2005, eleven students came together for a six-week intensive Co-operative Education experience. Faculty in either a science or computing facility at York or Seneca mentored the students, and shared time, talent and expertise. In addition to knowledge and new skills, students also learned about the world of work through a series of “in-

class” sessions leading to the successful completions of a Co-operative Education Credit.

The 2005 York/ Seneca Summer Science and Technology Program (YSSSTP) was coordinated by Jane Kennedy. Eleven students in Grade 11-12 were selected from four participating high schools to come and experience a post-secondary internship. Over a six-week period, students were mentored by a total of ten faculty and staff. Six members of York Faculty in the disciplines of Kinesiology, Chemistry, Physics, Astronomy, Earth and Atmospheric Science, Historical Science, and Computer Science were involved in the program. Two of the York faculty members were new to the YSSSTP this year. At Seneca College, students were placed under the guidance of four supervisors in the School of Biological Science and Applied Chemistry, and in the Academic Computing Systems Department.

Prior to commencement of the internships, students participated in a three-day orientation session held in the TEL building on June 27th- 29th. In subsequent days, orientation sessions focused on activities aimed at building a cohesive and dedicated community of learners. Students enjoyed learning about one another, teambuilding, developing a class contract, creating resumes and covering letters, honing interviewing skills, and also participated in an Assertiveness Training Workshop.

Weekly journal assignments, in class discussions, reflections, presentations and co-operative learning provided students with the opportunity to reflect and synthesize their learning. Not only did students gain proficiency in technical skills related to their work place, they also improved their communication, interpersonal, initiative, and problem solving skills. In class sessions were centered upon teambuilding and co-operative learning. Each weekly session focused on strands from the Co-operative Education Curriculum and included such topics as: Communication skills and Assertiveness Training, Workplace Safety, WHMIS training, Tours and meetings with Liaison Officers at both Seneca College, and York University.

Highlights of the in class sessions included student presentations about careers of interest to them. Their PowerPoint presentations reflected their commitment to higher learning, and demonstrated a high standard of communication and presentation skills. Second, students also participated in teambuilding activities which permitted them to develop their leadership and interpersonal skills. Finally, this year came to a close with the superior implementation of the "Legacy Project": a series of culminating tasks designed to have students reflect on their experiences and to provide information to future students, supervisors and potential sponsors. Three teams of three to four, each with a different focus, set about creating a web page, a promotional video, and orchestrating our YSSSTP final celebration. All three projects were designed to give the students additional technology-based, organizational and interpersonal skills for their resumes while also promoting the YSSSTP to future participants, supervisors and sponsors. The projects were an unparalleled success. These were all highlights of the summer program.

YSIMSTE appreciates the support of the YSSSTP donors; this program could not be offered without their generosity and commitment to youth and science and technology education. Our sincerest thanks to the following donors: The Lloyd Carr-Harris Foundation, Donner Canadian Foundation, Ontario Ministry of Economic Development and Trade, S.M. Blair Family Foundation, The Acapella Foundation and the McLean Foundation. We would like to acknowledge the efforts of the Office of Resource Development, Seneca College, who undertook fundraising on behalf of the YSSSTP.

York/Seneca IBM-WIT Chapter Off and Running!

The York Faculty of Science and Engineering has joined with the Seneca Faculty of Information Arts and Technology and the Faculty of Applied Science and Engineering Technology to form the first joint University-College chapter in Canada and YSIMSTE is providing support to the project.

The goals of the program are:

- to build awareness of exciting career opportunities for women in technology,
- to encourage girls/young women to keep their math and science options open in high school,
- to give girls/young women access to female role models in the Science and Technology fields, and
- to demonstrate to girls/young women that technology is fun!

During 2004-2005, the joint chapter hosted approximately 50 high school students at TEL for a half day web design workshop. In spring 2005 approximately 30 Grade 8 girls and their IBM mentors met for an afternoon activity-based electronics workshop sponsored by Seneca's School of Electronics and Computer Engineering Technology. In addition to these on campus events, York and Seneca student chapter members were invited to present workshops to GTA high school students.

Visit the website at <http://cs.senecac.on.ca/ibmwit> for more information on the chapter.

Workshops and Outreach Activities

Outreach Workshops: A number of outreach workshops and activities were conducted in 2004/05. Seneca's Faculty of Applied Science and Engineering Technology held a Science and Technology Week during the College's study week in February. Students in Grades 7 to 12 were treated to a variety of workshops in biotechnology, microbiology, electronics, environmental science, flight technology and skilled trades. The School of Biological Sciences and Applied Chemistry conducted two short laboratory courses in biotechnology for secondary school teachers and ran workshops for classes attending Biotechnology week at the Ontario Science Centre in May. The School of Electronics and Computer Engineering Technology has developed a one hour workshop that correlates well with the Grade 9 Science. In all, more than 1200 individual students and their teachers were involved in these activities during the

year. Please contact Laurel Schollen at 416.491.5050 extension 2430 or laurel.schollen@senecac.on.ca for information on workshops being offered for 2005/06.

Science Olympics: The York Region District School Board held its Science Olympics event at Seneca@York in March 2005. Margot Wassenaar-Faber, YSIMSTE Assistant Director acted as the lead contact for this event, which was attended by more than 300 high school students from York Region. Students were organized into Junior and Senior teams and were provided with a number of challenges in the disciplines of Biology, Chemistry, Physics and General Science involving the main theme of the event: CSI. This event is currently being planned for March 2, 2006 at Seneca@York involving a theme of ‘Toys and Games’.

York University Science + Engineering Speakers Bureau

The Science + Engineering Speakers Bureau was established to provide talks to high school and general-interest audiences on a wide variety of scientific topics. Our Bureau consists of members of the Faculty of Science and Engineering who are prepared to speak to students or teachers at an appropriate level about their research work, recent developments in science, or even items currently in the news.

We have a booklet listing the free talks coordinators or teachers may choose from for their classes, whether to complement or supplement the high school science curriculum, to inspire interest in post-secondary education in math and science, or to enhance scientific literacy. Many of the talks cross conventional disciplinary borders and all may be modified to suit audience requirements.

Readers may find an on-line version of the booklet listing available talks at: <http://www.science.yorku.ca/events/SpeakersBureau> or they can have a hardcopy mailed to them by contacting the Office of the Dean, Faculty of Science and Engineering, (416) 736-5051 or by e-mailing: mstasiuk@yorku.ca.

STAO Conference 2005

Once again, YSIMSTE will participate at the annual conference of the Science Teachers’ Association of Ontario. This year’s conference is being held at the Doubletree International Plaza Hotel in Toronto November 10 -12 and theme is “Inspiring the Future through Discovery”. We would be delighted to see familiar and not so familiar faces, so please do stop by our booth and those of our sponsoring institutions to say hello, pick up program information and exchange ideas.

Dr. Michael Gadsden from Seneca’s School of Biological Sciences and Applied Chemistry to present a session entitled “A Stroll Through Biotechnology” on Saturday, November 12 at 9:00 am.

York Region Sci-Tech Fair - 2005

Seneca College and York/Seneca Institute for Mathematics, Science and Technology Education hosted the York Region Sci-Tech Fair (YRSTF) in early April. Parents, judges, guests and fellow participants from the York Region public, catholic and private schools had an opportunity to view projects pertaining to Biotechnology, Earth & Environmental Science, Engineering, Life Sciences, Mathematics and Computer Science and Physical Science. Student participants were also invited to tour the campus attend workshops in biotechnology and microbiology offered by faculty in Seneca's School of Biological Science and Applied Chemistry. A total of 118 students with 78 projects showcased their talents at the Seneca@York Campus. YRSTF was represented by five finalists and their respective projects at the Canada-wide science fair (CWSF) in Vancouver, B.C. in May. Sarah Ali, a grade 8 student from As Sadiq Islamic School won a silver medal at the CWSF for her project entitled "The Effect of Pseudoephedrine on the Heart".

YRSTF 2005 was supported by Seneca College, York Catholic District School Board, York Region District School Board, Pfizer, Wyeth, Can-Ar Coach, Wellington Environmental, York University, Sci-Tech Ontario, and the York Region Amateur Radio Club.

The organizing committee is now planning for the 2006 York Region Sci -Tech Fair. The fair will be held on Saturday April 8, 2006 at the Stephen E. Quinlan Building, Seneca College, Seneca@York Campus. This year the program will be expanded to include an electronics workshop offered by Seneca's School of Electronics and Computer Engineering Technology.

We welcome your participation as a volunteer, sponsor, or judge. We encourage all grade 7-12 teachers in York Region to offer this opportunity to their students. Please visit <http://yrstf.senecac.on.ca> for details and a full description of the fair and our 2005 winners.

YSIMSTE at OAME 2005 Nexus:

The annual Ontario Association for Mathematics Education conference was held at York University, May 12 - 14, 2005. The theme of the conference, "Building Mathematical Connections", was woven throughout ten strands - The Art of Teaching Math, Assessment, Inter-Disciplinary Studies, Leadership, Patterning & Algebra, Product Presentations, Research, Diverse Learners, and Problem Solving. YSIMSTE and York faculty presented on a number of topics including "On-line Professional Learning", "Working with visuals in the mathematics classroom", and "College Mathematics – Let's Talk".