

Fall 2004, Vol. 6, No. 1

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

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

Contact Information

Graham Orpwood, Director
416.736.5269

Laurel Schollen, Director
416.491.5050 ext 3775

Margaret Sinclair,
Assistant Director
416.736.5269

Margot Wassenaar-Faber,
Assistant Director
416.491.5050 ext 3248

YSIMSTE News is published
three times each year and is
available in electronic format

YSIMSTE is supported by
York University and Seneca
College.

TEL Building, Room 3150
4700 Keele Street,
Toronto, Ontario
Canada M3J 1P3

416-736-5269 (phone)
416-650-8080 (fax)
ysiste@edu.yorku.ca
www.ysimste.ca

Supporting School Improvement (SSI) Analysing Mathematics Achievement Data

YSIMSTE has obtained a research grant from the EQAO Research Program to support the first phase of a new initiative designed to assist principals with school improvement planning. This research, led by Professors George Frempong, Margaret Sinclair and Graham Orpwood, will develop a Mathematics Improvement Index (MII) for each of Grades 3, 6 and 9 and for all schools in the participating school boards. Those schools whose Mathematics Achievement has improved the most over a five-year period will then be studied more closely to see what special factors have contributed to this improvement.

To date the Toronto and Simcoe-Muskoka Catholic District School Boards have expressed interest in participating in a pilot study being conducted in the 2004-2005 school year. It is planned that other statistical analyses will also be developed and that these will “add value” to the achievement data already provided to schools by EQAO. It is also intended that the qualitative data obtained through the more detailed studies will contribute valuable information to all schools seeking to improve mathematics achievement. Further information about the SSI initiative may be obtained from YSIMSTE (phone 416-736-5269 or email us at ysimste@edu.yorku.ca).

A New Team for a New Year

It has been a while since our last issue of “News” and we are pleased to report that we have new projects and opportunities underway. You’ll note our new name and identity: the York/Seneca Institute for *Mathematics*, Science and Technology Education (YSIMSTE). The inclusion of mathematics in our name and logo is a reflection of the commitment we have to supporting the teaching profession in all aspects of mathematics, science and technology.

We'll be undertaking projects specifically around issues of importance to educators from elementary to postsecondary, including student achievement, the impact of the new curriculum and recent media coverage of student preparedness for post secondary programs. YSIMSTE has recruited a number of experienced faculty from both York University and Seneca College to support these initiatives. Please contact us if you are interested in participating.

The team has undergone some changes in the past few months. Ray Bowers is still associated with YSIMSTE but is currently "on loan" to the Faculty of Education, Research and Field Development Office, where he is assisting the development of on-line AQ courses. In his place we welcome Dr. Margaret Sinclair in the role of Assistant Director of YSIMSTE. Margaret is a professor of mathematics education with the Faculty of Education at York. In addition, we have a group of enthusiastic graduate students whose energy and enthusiasm is always exciting. One of these, Jane Kennedy, a secondary school chemistry teacher on leave from the Durham Board of Education, coordinated our summer science and technology project this year and her report on this follows.

Summer Science and Technology Project 2004

By Jane Kennedy, YSSSTP Coordinator

The 2004 York/Seneca Summer Science and Technology Program (YSSSTP) was an unqualified success in providing students with the opportunity to gain workplace and interpersonal communication skills, while also being immersed in post secondary environment. Students learned about employment and opportunities in the fields of Science and Technology, and gained a firm understanding of the realities of workplace responsibilities. Within the classroom environment students were given the opportunity to sharpen their leadership and teambuilding skills, to become a cohesive community of learners, and to appreciate the importance of initiative and work ethic in their future working lives. The overwhelming importance of continuing to provide this opportunity cannot be overstated. Allowing youth to learn, grow, set goals, and expand their expectation of themselves is what the YSSSTP is all about: it is a magnificent example of inter-institutional co-operation and a testimony to power and influence of positive role modeling; most importantly it is an investment in the future - our young people. We invite you to view the student created YSSSTP website at <http://ysssstp.tk/>



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.

YSSSTP 2004 - Student Reflections

The 2004 York/Seneca Summer Science and Technology Program (YSSSTP) brought together fifteen Grade 11 – 12 students from four secondary institutions to the central York University campus and the Seneca @ York campus of Seneca College. Over a six-week period, students were mentored by faculty and staff at these institutions in a variety of science and technology disciplines.

Some of the students share their personal reflections....

“This is the end of a wonderful journey which started by a teacher’s recommendation and ended with much more. The past six weeks have been fun, knowledgeable, self-building and very interesting. Looking back I have just compliments and no complaints, only memories and no regrets and importantly I think it has made me a better individual.”

Abdullah Ramay

“One of the greatest opportunities offered to high school students around the Jane and Finch community is the remarkable summer co-op program available to them at York/Seneca. Though this is only a co-op placement prior to post-secondary education, we were all given a chance to expand our knowledge, skills, and attitudes and work relationships in the working industry.”

Dinishni Benetteraj

“What was learned in these past six weeks, I would not have been able to do on my own. What I have learned I will carry on using in my future endeavours and career, no matter what field I choose.”

Riaz Hassan

“The goals I had for the program were to acquire a diverse knowledge and skills in the field of science and technology, labs and also about life as a university student. I was able to achieve most of my goals through reading of books on my labs and demonstrations, lectures on topics like MRI and EPR from my supervisor. Through performing and observing labs I achieved the great lab skills that I will need in my future studies. I also acquired computer skills through training at the microcomputer training centre. I learned about the university lifestyle through the students that I assisted in the labs. I gained further knowledge through various conversations I had with professionals in the university. Unfortunately my goal to learn how to build a website did not happen because of time factor. I also did not get the chance to perform the labs on solar cells because the professor in charge was in Germany during my co-op time.”

Sandra Awuku

“I leave the placement with experience in making many different types of solutions, using various types of machines like the autoclave, Spectronic 20’s, micropipettes and many others. I have also had the opportunity to carry out experiments that are done by college students. I think this is the best summer job a student can ever get. This is a job, which pays, gives you a credit and provides one with plenty of skills and experience, which can be useful in high school and post-secondary education.”

Amrinder Saini

“This placement has not affected my choice of career but it has given me the chance to find out the possibilities out there in our society of technology. Being able to understand and use computers will affect my life due to the fact that technology is advancing and shortly, computers will be used in every career and/or job. This intuitive program allowed me to realize how important education is and the significance of post-secondary education. It is the opportunity worth taking!”

Duong Huynh

“This summer passed away in a blink of an eye and in the fraction of a second I have gained so much knowledge and skills that I couldn’t have possible gained by sitting around at home or at school. I gained work experience and work skills that are necessary to survive in the work force. I’ve acquired communication skills that will help me ensure a bright future because communication is the key to a strong relationship between the employer and its employees.”

Arvindjeet Singh

York/Seneca IBM-WIT Chapter Off and Running!

We are pleased to announce the recent formation of the first joint college/university IBM-WIT (Women in Technology) chapter. The chapter is IBM Canada's 23rd WIT (K-12) Chapter; and its 6th in Higher Education.

York University and Seneca College are keen in joining resources to enhance outreach to young girls. IBM provided the initial training for the York/Seneca chapter members, who in turn act as facilitators to deliver workshops in K-12 classrooms. The workshops are designed to inspire young women to choose a career path in any one of the many diverse and challenging technology fields.

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!

There are currently more than 90 members in the York/Seneca chapter. A recent information session attracted 20 new student facilitators from both institutions. The chapter is led by Renu Kumar, a York University undergraduate student and Jennifer Parker, a faculty member from Seneca's School of Computer Studies. The co-leaders provide support and encouragement to keep everyone on track. We would like to thank the administration of The Bishop Strachan School for their very generous donation of five laptop computers which are available for the facilitators.

Outreach workshops will be held at various GTA schools through the fall and winter. Visit the website at <http://cs.senecac.on.ca/ibmwit> for more information on the chapter.

Biotechnology Laboratory Course for Teachers

This last summer was a busy period for the biotechnology faculty of Seneca's School of Biological Sciences and Applied Chemistry presenting lectures and hands on workshops.

In May several faculty of the School' participated in the Aventis Biotech Challenge and Biotechnology Week at the Ontario Science Centre. Each day Dr. Alison Symington presented a talk entitled "Biotech: Explore the Possibilities". This was attended by over 800 secondary school students and teachers. As well, Seneca faculty and students presented a number of hands-on workshops including "Extracting DNA: How to do it at home", "CSI and Cells" and "Searching for Urchins".

Seneca's School of Biological Sciences and Applied Chemistry offers secondary school students the opportunity to attend the college for a day to receive hands-on-training in a number of areas. During the day students have the opportunity to actively participate in three separate biotechnology areas.

Biotechnology: This portion of the day entails the isolation of DNA from onion cells and the separation of DNA fragments on an agarose gel. Students actively participate in these exercises that can be related to techniques often seen on TV shows and News programmes. Finally, the students are introduced to Polymerase Chain Reaction (PCR) technology and are given a set of data to use to determine the paternity of a child and/or the identity of a murderer using all the skills encountered in this hour long session.

Bioethics: Students are exposed to the complex questions of bioethics related to human cloning, the completion of the human genome project and the influence of genetic screening on human reproductive choices and the relationship of biotechnology with the media. Students discuss the issues using a scientific basis to dissect the ethical implications of the progression of biotechnology.

Microbiology: A hands-on workshop which introduces students to basic microbiological laboratory techniques. The students use microscopy and biochemical testing procedures to determine the identity of three "mystery" bacteria. The students also explore industrial applications of microbiology by examining yogurt samples (using basic slide preparation and staining techniques) and microscopically detecting the bacteria used to produce this fermented food product.

If you would like to receive additional information on this programme and set up a day for your students please contact Alison Symington (416 491-5050 ext. 3246 or email alison.symington@senecac.on.ca) or Dan Phillips (416 491-5050 ext. 3773 or email dan.phillips@senecac.on.ca).

Outreach Activities at the Centre for Advanced Technologies

Many of us have no doubt seen and heard the latest government advertisements aimed at attracting young people into the skilled trades. The team at Seneca's Centre for Advanced Technologies located at our Jane Campus are veterans at promoting these technology based programs and so they welcomed this province wide campaign. For years, the sectors have been predicting a skill shortage and now it is "front and centre."

Times have changed and it is important for teachers and young people alike to be aware of the opportunities and the impact technology has had on many of the skilled trades. Today's students must be proficient at math, computer assisted design, problem solving and have a creative sense in order to meet the expectations of today's employers. Yes, time is still spent in the shop, but almost all of the equipment is computer driven and rapid prototyping affords the opportunity to "test" the design before an expensive die or mold is made.

The faculty and staff at Jane Campus have designed workshops for students from Grades 7 to 11 (and their teachers) to introduce the world of opportunities of skilled trades in tool and die, tool design, mold making and CNC programming. Last December and May the campus played host to more than 200 grade 7 and 8 students from Northern Heights PS, Oak Ridges PS and Sutton PS and Grade 11 students from York Catholic District School Board (YCDSB). It was a real education for some of the teachers as they participated in operating milling machines and CNC equipment. In the year 2000 we signed an agreement with York Catholic District School Board that enables students to take a course at the Jane Campus in the winter semester, taught by an YCDSB technological education teacher. The exposure has “converted” many participants to a post secondary education in the skilled trades area and is viewed as a “win-win” by both YCDSB and Seneca.

The faculty and staff at Jane Campus would love to host your class (and you!) for a ½ day experience. Unfortunately, we have only a few weeks each year in which we can operate these workshops, so it is important that you call in advance to book your “advanced technologies experience.” Contact Ken Ellis at 416.491.5050 extension 4354 for more information.

STAO Conference 2004

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 11 -13 and theme is “Managing Change for Successful Learning”. 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 will head a team from Seneca’s School of Biological Sciences and Applied Chemistry to present a session entitled “A Stroll Through Biotechnology” on Friday, November 12 at 9:30 am. Speakers from York University include Dr. Robert Prince and Dr. Paul Delaney. Dr. Delaney’s address “Ah to be an Astronomer in the 21st Century” is scheduled on Thursday, November 11 at 12:30 pm. Dr. Prince’s presentation, “Science or Engineering: Which is the right choice?” is scheduled on Friday at 3:30 pm.

York Region Sci-Tech Fair - 2004

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. A total of 136 students with 97 projects showcased their talents at the Seneca@York Campus. YRSTF was represented by three finalists and their respective projects at the Canada-wide science fair in St John’s, Nfld.

The organizing committee is now planning for the 2005 York Region Sci -Tech Fair. The fair is scheduled to be held on Saturday April 9, 2005 at the Stephen E. Quinlan Building, Seneca College, Seneca@York Campus. Please visit <http://yrstf.senecac.on.ca> for details and a full description of the fair and our 2004 winners.

OAME 2005 Nexus: “Building Mathematical Connections” comes to York University in May!

The annual conference of the Ontario Association for Mathematics Education will be held at York University, May 12 - 14, 2005. The theme of the conference, “Building Mathematical Connections”, will be woven throughout ten strands - The Art of Teaching Math, Assessment, Inter-Disciplinary Studies, Leadership, Patterning & Algebra, Product Presentations, Research, Diverse Learners, and Problem Solving. Keynote speakers will be renowned scientist, David Suzuki and broadcaster, David Onley. Registration information will be available soon at: <http://www.oame2005.ca>.