Advanced Broadband Enabled Learning (ABEL) seeks to improve student achievement and transform teacher/faculty professional practice through the use of broadband and information communications technologies (ICT). ABEL has developed new technological and pedagogical knowledge and practices that is aligned with today’s learner. It provides the participant with access to a learning platform, a professional growth program, implementation strategies and a research and evaluation component.

The ABEL program is funded by public and private sector partners and led by York University. ABEL demonstrates the educational value of broadband networks for teaching and learning and has the expertise and knowledge base that allows school districts to leverage broadband networks for student achievement.

Janet Murphy
With over 27 years of varied educational experience, Janet is in the unique position of having responsibility in both K-12 and post secondary education. Janet currently leads and manages Advanced Broadband Enabled Learning (ABEL) for York University’s Office of the Vice President Research and Innovation. She is also the Manager of Innovative Learning Solutions for the York Region District School Board (YRDSB). In these positions, Janet provides leadership in the implementation of broadband resources to students, staff and community. This includes developing e-learning programs that support Virtual Schooling and online professional and leadership development. Janet also coordinates involvement and collaboration in e-projects with other school districts, colleges and universities across Canada and internationally.

“ABEL does more than advance technology, it connects people. And when people are connected to each other, it opens the way for innovation.”
Janet Murphy
A university science professor asks high school students, "Can math be used to explain social events?" and "How can math be used to measure peace?" Using videoconferencing, the professor drew on his expertise in mathematics and technology to engage students in conversations about the role of mathematics in understanding social phenomena. The students were very interested in the lesson and they had strong, positive feedback on the presentation; they were excited to understand the relevance of math for modern issues.

The students appreciated the opportunity to ask the professor questions and they felt that he was very knowledgeable. The interaction made the students think further about issues related to mathematics, such as math's effects on warfare. One student stated, "I enjoyed the thought of speaking to someone far away, but having them in the same room."

The videoconferencing technology has the potential to serve audiences - including several audiences simultaneously - which could never be served in the traditional way," said the science professor, as he spoke about the ABEL presentation and the potential for using this type of technology to connect students with university faculty members.

**Connecting education communities**

Professor teaches students via broadband: Mathematics concepts provided authentic context.

A university science professor asks high school students, "Can math be used to explain social events?" and "How can math be used to measure peace?" Using videoconferencing, interactive chat, and shared applications to facilitate the discussion, the professor draws on experts and theorists in the field such as Albert Einstein and J. Robert Oppenheimer. He asks students to investigate mathematical models, cryptography, quadratic equations and trigonometry to explore and illuminate connections between mathematics, peace and war.

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**Engaging the Learner**

ABEL uses interactive digital resources, online multimedia content and authoring applications, collaboration and videoconferencing technologies to make it easy for teachers, faculty and their students to share course materials, specialized instructors and effective practice.

Imagine the classroom connected to the broadband network where the teacher uses a variety of information communication technologies (ICT) to engage the learners and enrich the curriculum. The teacher uses presentation software connected to a projection device to deliver the lesson. Streamed video content embedded in the lesson provides students with visual and audio cues. Students respond to questions posed by the teacher in their ABEL learning space. Some students are meeting with their virtual teams to disseminate and synthesize their research. These students may also have access to experts in the field. The culminating activity may include the use of videoconferencing and collaborative tools that allow them to meet present critique and evaluate with others over the network.

The teachers develop:
- a new pedagogical approach to teaching and learning
- technical knowledge and skills
- a positive attitude towards job-embedded learning
- access to opportunities for accredited professional development

The students develop:
- critical thinking skills
- collaboration and communication skills
- ICT knowledge and skills
- access to experts and peer mentors

**Experts direct**

**Gr. 10 student’s**

**Canadian Sovereignty vignettes via broadband!**

A teacher states that her students now understand the issues surrounding sovereignty better, and in more depth than she can remember for any group of grade 10’s in her 25 year teaching career. Their deep understanding came from working with the Monster Theatre Troupe over several weeks to research sovereignty, to select some issues important to the students, and to create a number of video vignettes that would tell a story of sovereignty and be fun. The teacher used a videoconference to bring the Monster Theatre Troupe virtually into the classroom. During the videoconference, it seemed as if the directors and students were in the same room. The directors felt they had to be a bit more specific with their cues, but it made the students listen more closely. Traditionally, this area of curriculum is difficult for students but working alongside authentic mentors deepened understanding. The directors felt that using the videoconferencing technology was a great experience and they could see the possibilities in the theatre world.

The Canadian Sovereignty videoconference was part of ongoing work with Galileo Educational Network.

**Science students learn about parasites through ABEL videoconferencing**

Grade 11 workplace science students learn about “Insects, Worms and Health” from a professor during an exciting videoconference on parasites between the University and the school.

Research professor emeritus of biology in the Faculty of Pure & Applied Science, videoconferences with students at the school when he delivers his presentation with the help of ABEL tools.

"Conducting a presentation to school students by videoconferencing is different from being in the same room, but one can see the students and take questions from them, and they are seeing your visual aids,” said the professor.

"The technology is a powerful tool for bringing a good deal into the classroom that might not otherwise be available."

The high-school science teacher noted that her students enjoyed the experience and appreciated the knowledge imparted by the professor.
Connecting education communities

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High school students share a field trip experience with another high school class from a geographically distant school. Students are solving a murder mystery using expert resources from the Ontario Science Centre. They are leveraging virtual community space to share information and knowledge that will lead to a discovery and presenting their findings to peers over the network. Virtual field trips are possible using broadband networks and implementing the Advanced Broadband Enabled Learning (ABEL) program. ABEL provides the expertise that allows students and teachers in different locations to interact with one another using videoconferencing and collaborative technologies.

York University Faculty of Education instructor is on hand with OSC forensic experts to facilitate the learning experience. "It is very exciting to see how the technology facilitates a higher order sharing of ideas and processing of ideas among people - that is so important."

"I really appreciate the opportunity to apply the theory of what we had learned in class to the 'hands on' activity at the Science Centre," says a student.

"By connecting people and applying inquiry pedagogical approaches to learning, ABEL is using collaborative technology to enhance learning environments and solve traditional curriculum challenges," says Janet Murphy, ABEL program manager.
Connecting to field trips - virtually!
Developing critical thinking skills and authentic curriculum

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Law Teachers brainstorm the idea for conducting a mock trial via videoconference and put a notice in the ABEL online community asking if other ABEL teachers would like to collaborate on a grade twelve curricular-based law project. Four sites meet over the broadband network for the mock trial: two Ontario sites, one Alberta classroom and an Ottawa site where the expert Justice resides over the courtroom. The sites connect in real time and each have a role to play in the trial. The role of two classes is not defined until the Judge clarifies which site is the prosecution and which site is the defense. The class from Calgary is predetermined as the jury for the mock trial.

The drinking and driving case is presented as if taking place in an actual court of law with the expert judge dressed in proper attire and stern in courtroom proceedings. The case is played out with the teachers now taking a backseat role after preparing their students and planning the video-conferencing event. The students lead the entire case as lawyers, witnesses and experts etc.

It was impressive to see the seriousness and mature manner of the students as they present to other sites and fight their cases. The multiple sites increase importance in the law project and push the students to prepare in advance for being either the prosecution or the defense:

“There is an increased level of preparation taken when you have an audience both in the form of an expert judge and student jury,” said one teacher. He believed that his class had a “more inherent understanding of the curriculum content through the mock trial video-conference than they would have if it were done just within their own school classroom.”

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Ongoing research informs the development of the ABEL model by finding answers to compelling questions regarding the impact of broadband implementation and ICT use by educators and students. Today’s students use technology as an integral component of the knowledge-based society in which they live. ABEL harnesses the benefit of ICT to open the classroom to the world.

“Learning and teaching opportunities afforded by such networks are well worth the investment.”

Janet Murphy

ABEL and ORION

The ORION network is Ontario’s broadband optical connection that links Ontario’s regional advanced networks to one another, to the rest of Canada, and to the rest of the world. Universities, colleges, K-12 school districts and other public institutions use ORION’s advanced infrastructure to conduct real-time collaborative work and activities, share resources in real-time, move data and images, and develop inter-institutional and inter-jurisdictional relationships. As well, ORION is the provincial connection to the national broadband network, CANARIE, CANET4.

Janet Murphy

www.abelearn.ca
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Partners:

York Region District School Board, York University

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