Final Research and Evaluation Report

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Authors

Herbert Wideman
Ronald Owston
Mary Leigh Morbey
Colette Granger

With contributions from

Laura Servage

Alice Brode

Razika Sanaoui

Elizabeth Springate

Reza Nasirzadeh

Jennifer Wismer

Margarete Juliana

Elaine Greidanus

Institute for Research on Learning Technologies
York University

Executive Summary

Introduction

The Advanced Broadband Enabled Learning Project (ABEL) sought to break new ground in Canada by applying leading edge technologies in the service of a comprehensive and innovative new approach to inter-jurisdictional teacher professional development. It was designed to facilitate the transformation of teaching by establishing a sustainable collaborative learning model for distributed educational delivery and teacher growth that incorporated the use of broadband technologies. The project provided teachers in selected schools in Alberta and Ontario with access to videoconferencing hardware, a range of software applications, the technical and pedagogical support needed to use these applications, access to Canada's high speed data network CA*Net 4, and commitments from their school boards to facilitate participation in the project. ABEL's goal was to provide teachers with opportunities for continuous self-directed professional learning on the job in partnership with colleagues in the project, and to move teaching toward being more learner-centred, collaborative, and inquiry-based. Project development started in early 2002, with the teacher professional development component being in full operation by fall 2002. Both public and private partners, including York University and the University of Alberta and a number of software and resource providers, as well as thirty-two teachers from six secondary schools (three in Edmonton and three in the Greater Toronto Area) participated in the project.

In the professional growth program, teachers participated in a combination of large group videoconference events that focused on key themes (e.g., the use of ABEL tools, inquiry learning, effective videoconference techniques, and small group subject area-specific videoconferences in which they brainstormed, planned learning events, and sought out colleagues with whom they could develop cross-class and inter-provincial student learning projects. The development of learning events and projects was facilitated by post-secondary advisers and learning leaders associated with ABEL, who supported teachers in incorporating inquiry learning approaches into their initiatives. The projects were implemented in the classroom, and could incorporate one or more of a number of elements, including class to class videoconferencing sessions, the use of streaming media from repositories, student creation of web pages, PowerPoint presentations or other digital artifacts, and videoconferences with leading experts or participants in significant events. Projects ranged in extent from bringing in a guest speaker as an enrichment activity to having students work over several weeks on inquiry-oriented projects which incorporated videoconferencing events to support collaboration with another class. Both students and teachers made use of the ABEL Community web site, which provided discussion forums,

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chat, a calendar of ABEL events, and a portal to the suite of ABEL software tools and online resources.

The research team employed participant interviews, surveys, observations, and learning project case studies to examine how teachers grew professionally as a result of engaging in project activities and events. The study also investigated the changes in practice that occurred over the duration of the project, how students benefited from ABEL learning projects, and institutional impacts. These findings, together with data on the obstacles and challenges ABEL encountered, served as the basis for developing an understanding of the conditions needed to sustain the momentum for change generated by the project.

Teacher professional growth

All of the teachers who actively participated in the project experienced significant professional growth, although the nature and extent of that growth varied. Development occurred in two main areas: level of technology skill, and changes in pedagogical orientation and practice. With respect to the former, even those teachers who already possessed considerable information and communication technology (ICT) skills found themselves developing new abilities in the use of broadband for streaming media and videoconferencing, and expanding their knowledge to incorporate unfamiliar resources and unique software tools that were part of the ABEL Project. Teachers with less ICT background found involvement with ABEL greatly expanded their capabilities and comfort with a range of ICT applications from discussion forums to PowerPoint and the WebCT course authoring tool. Over the course of the project, teachers explored and utilized many of these new tools, technologies, and resources in their ABEL projects, and then began incorporating the use of some of them into their set of common teaching practices. Their work demonstrated their growing capacity to effectively infuse ICT into their teaching.

Most teachers found their experiences in ABEL projects also led to an expansion of their pedagogical repertoire to include more collaborative and student-centred instructional approaches. In the words of one teacher, her ABEL project "enabled [me] to see there are other ways students can learn and become more involved personally in learning." Many teachers reported undergoing changes in their perspectives on what constitutes good teaching, and were beginning to grapple with the concepts and rationales of inquiry learning and in certain cases to start implementing many aspects of inquiry pedagogy in their ABEL projects. For several teachers their exposure to inquiry learning models and techniques was a

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professional awakening that heightened their enthusiasm for teaching; for example, one English teacher revised her entire grade 11 course to incorporate inquiry learning and found the results very rewarding. There was a small minority of teachers for whom inquiry pedagogy had little appeal, however, as it was seen as impeding the full coverage of a broad set of curriculum expectations that had to be met.

Teachers cited a number of factors that promoted their professional growth in the project. For the vast majority, the most important was the affordances it provided for collaboration with colleagues, through both the large-group and especially the smaller subject-oriented teacher videoconferences that were held intermittently throughout the year, the two face to face Summer Institutes held for three days each year, and opportunities to work with partners from other schools to collaboratively develop their learning projects. Teachers greatly valued the learning they gained collaborating with colleagues both formally and informally, and a strong sense of community developed amongst participants that cut across school and provincial jurisdictions.

A central element of the ABEL model as implemented that facilitated teacher growth was the practice of grounding professional development in the classroom. This was achieved by providing ongoing support to teachers as they collaborated together in the creation of innovative curriculum projects. To foster this development, ABEL provided hardware and software resources, pedagogical support, and (most significantly) regularly scheduled release time which afforded teachers the time needed to inquire and brainstorm, learn the technology, and plan and develop student learning projects.

The projects developed by teachers varied in the degree to which they incorporated the key elements of inquiry pedagogy (e.g., student agency, authentic contexts and audiences, and collaborative knowledge building). Most made use of videoconferencing to allow students to interact with participants in significant events or experts normally not accessible, and/or to give students themselves a chance to dialog with remote peers around project issues. It was employed to support interaction for a range of curricular purposes, including facilitating interschool math problem solving activities, critiquing of student art by artists, and conducting interclass mock trials. Students relied heavily on ICT for their project research, communication, and presentation, and were usually allowed to select what ICT tools and resources they wished to use for their work. Student project development might incorporate one or more of a wide range of digital products and media, extending from PowerPoint presentations to web page authoring and digital video production.

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Student outcomes

In most ABEL learning projects, students displayed higher levels of engagement than was typical in other classroom contexts. Videoconferencing proved to have a notable, even dramatic impact on most students' engagement levels in ABEL projects, and not just during the videoconferencing event itself. Students reported finding videoconferences interesting and exciting; they enjoyed opportunities to see and talk to students from other schools and regions, and to discover differing regional views on topics and issues being studied (such as energy use and conservation). They were also highly attentive when experts or participants in significant events participated in a videoconference. But the novelty of the medium, which no doubt contributed to student excitement, also had a tendency to limit meaningful dialog, as most students appeared quite inhibited about speaking "on camera"—a reaction that would likely diminish given greater exposure to the experience.

Curriculum-embedded projects that incorporated videoconferencing were seen in most cases as having significantly better outcomes than traditional projects. Students conducted more thorough research, spent more time developing reports and presentations, collaborated with peers more effectively, and were often more self-initiating and self-directive in their work. In a few classes where major inquiry projects were undertaken teachers noted improvements in grades for exams that covered project topics. Teachers also saw students benefiting from the widened purview that videoconferencing with others in a distant region of the country made possible. Exposure to different regional cultures and perspectives was seen as broadening students' awareness and appreciation of Canada and their place in it.

Students were able to produce digital presentations and artifacts for their projects that incorporated a greater range of media and were more elaborately designed than Bristol-board projects, and their work commonly demonstrated a high level of mastery of ICT tools. The projects' conceptual content was often more developed and extensive than what teachers were used to seeing (but by no means was this always the case).

Institutional roles and jurisdictional issues

Several faculty from the York University Faculty of Education participated in the project, introducing and guiding preservice candidates in the use of ABEL tools and resources. It was also their intention to work with the practicum placement staff to ensure that some of their students would be placed with ABEL teachers for their field experiences, but with a few

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exceptions these placements did not occur. The faculty group also developed an Inquiry Learning website with broadband resources for supporting inquiry pedagogy in the ABEL community. The University of Alberta Faculty of Education offered a Masters-level online course on broadband-enhanced learning for the participants which six teachers completed, and found to be both interesting and of practical value. Seneca also offered courses in ICT and education to ABEL teachers but no teacher completed any course. One Seneca faculty member became an integral part of the mathematics teacher group, acting as a mentor to both teachers sand students. Staff from the Galileo Network in Alberta were also involved with the math teacher group, and supported several other teachers in their use of Galileo's IO course development environment as well as presenting to ABEL teachers on inquiry learning principles in two teacher videoconferences. Artists from the Banff Centre for the Arts acted as resources and mentors in one major arts project and their Director of Continuing Education was an active member of the ABEL Learning team.

The ABEL leadership played a critical role in negotiating and facilitating cooperation between the institutions and jurisdictions involved in the project. Without the efforts of the full-time management team working together with the learning lead team institutional inertia would have doubtless prevailed and the ABEL endeavor floundered. These dedicated individuals also provided support to teachers seeking ways to overcome the two inter-jurisdictional issues that were of primary significance in the project. The first of these was a consequence of the differing provincial curriculum expectations and requirements in Alberta and Ontario which sometimes made collaboration between teachers teaching the same subject in a given grade difficult, either because the teachers had no units in common or specific curriculum expectations to build joint projects around, or because the common curriculum was covered at different points in the year in each class. The second arose from the inter-jurisdictional differences in school schedules and annual calendars, together with the two hour time difference between provinces and the lack of a regular release time for the 11 teachers participating from the Toronto school. These differences made scheduling videoconferences very challenging; many teachers in Toronto could not attend teacher videoconferences as they often occurred in school hours, and bringing students together for a conference sometimes meant pulling them out of scheduled classes or having them stay after school.

Teachers demonstrated considerable ingenuity in working around these difficulties, and were able to successfully implement a number of curriculum-embedded interprovincial projects. Nonetheless these obstacles did prevent several teachers from finding partner classes for their ABEL projects.

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Moving ABEL forward

Maintaining the momentum for transformation in teaching and learning that has developed in the ABEL community will be a major challenge, particularly in the light of the substantial reduction in financial resources that the initiative now faces. Several problematic elements of the ABEL experience to date will need to be addressed to sustain and deepen ABEL's impact on teaching and learning. The first concerns the technical reliability, quality, and ease of use of the broadband technology, particularly that associated with videoconferencing. Teachers cited the poor reliability of the videoconferencing as the major weakness in the project. Conference connections could often take ten or fifteen minutes to establish, or occasionally not be established at all; audio and/or video connectivity would be dropped and have to reestablished; and sound quality was sometimes so poor as to make understanding remote speakers (especially students) difficult. These problems would frustrate teachers and make students lose interest in the events, reducing their educational value significantly on many occasions. Teachers also requested a videoconferencing system that would be easier to set up, use, and take down so it could be employed more quickly and flexibly; something akin to the ease of working a VCR.

Increasing collaborative opportunities for teachers by raising the number of participating teachers and, where possible, negotiating better synchronization of course and release time schedules across schools and districts is the second step that needs to be taken. Easing timetabling issues would allow teachers to pursue the development of truly collaborative interclass inquiry projects in which students work in small cross-class groups on a sustained basis, something that has not occurred to date in the project.

Efforts need to continue to further advance teacher pedagogy by means of collaborative coaching and mentoring practices. If teachers lose their release time they will only be willing to devote the extra time needed to sustain ABEL projects in class if they see students benefiting substantially from this work, and that will only happen when advanced pedagogies of inquiry and student-directed learning are employed. For as with any other new technology, the novelty of videoconferencing will wear off and its utility will then very much depend on the quality of teaching activities in which its use is embedded.

Having extra time available to pursue ABEL work was critical to the participating teachers. Most of the teachers with release time indicated that there was no way they could have achieved what they had without it, and many thought that if it was lost, the pace and extent of their project

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work would drop off. Every effort should be made to maintain ABEL development time, especially for teachers new to the ABEL project. For in contrast to more conventional approaches to professional development, the open-ended, teacher-driven, and job-embedded nature of the ABEL model necessitates considerable self-initiated exploring, learning, and experimenting on the part of participants if teaching is to be transformed. In addition, effort should be made to retain and maintain ABEL tools as well as the online ABEL Community.

Conclusion

The ABEL project was largely successful in demonstrating the value of its collaborative professional development model. A true learning community was created, in which teachers after some initial hesitation assumed agency in their own professional growth, collaborated and supported each other in developing new technical and pedagogical knowledge and exploring new teaching practices, and frequently incorporated key elements of inquiry learning in their ABEL teaching projects. If the issues outlined above are successfully addressed, ABEL's capacity to help teachers transform their practice can be both sustained and strengthened.

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