LearnCanada
Final Summative Evaluation Report

Prepared by

Marion Barfurth, Ph.D.
September 30, 2002
barfurth@uottawa.ca

www.learncanada.ca

Table of Contents

Introduction

The summative evaluation was designed to capture the teachers' evaluation of the use of Broadband Visual Communication Technology for the Professional Development of teachers that was implemented in the LearnCanada project. The questions developed for the summative evaluation were constructed with the aim to capture precise feedback for each of the four project components. These are – professional development, infrastructure, video-annotation server use and virtual community.

This report is divided into nine different sections. These are:

- methodology,
- participants
- professional development
- infrastructure
- video-annotation tool
- virtual community
- project sustainability and dissemination
- overall project evaluation
- concluding remarks

Methodology

The summative evaluation questionnaire consisted of a total of 33 questions. As so little was known to date on the application of broadband visual communication technology for professional development, the summative evaluation was designed using the emerging categories and variables identified during the formative evaluation process which immediately preceded this report. This allowed for a more precise targeting of the data to be collected.

Following a few demographic questions, the survey asked the teachers about professional development using broadband visual communication technology, the technological infrastructure used for the project, supporting multi-media software developed for the project, the development and evolution of a virtual community. As well it included questions related to project sustainability and dissemination.

The summative evaluation survey was administered online as a Web-based survey to all teachers simultaneously across the country. The software used was ViaWeb survey [http://viawebsurvey.epsb.net/] developed by the Edmonton Public School Board in Alberta. It was run as a multi-site event with the teachers filling in the surveys individually at each site. The evaluator was also available on-line to give instructions, answer any questions and provide clarification. Instructions were given both verbally and in writing (at the top of the survey) at the beginning of the virtual conference. At that time, the teachers were informed on how this evaluation was distinct and different from the previous series of formative evaluations, in that the questions were all new and the focus was on the project as a whole rather than on finite events within the project.

The results from the survey were then analysed and are summarized here. It is important to keep in mind that these results are derived from self-reports from the participating teachers. This means that because there is a direct relationship between the subjects and their time and energy invested in the project there may be a tendency to report only their more favourable opinions. This is a known confound in this type of self-report survey research.

Participants in the summative evaluation

Teachers from four different provinces (Newfoundland, Quebec, Ontario, Alberta) participated in the LearnCanada project. Twenty-one teachers out of a possible 23 replied to the questionnaire. All six school boards from across the country were represented. Three quarters of the teachers were participating in the project for the second year with the remaining quarter being their first year. This shift in teachers from Year1 to Year2 is not unusual given the changes that school boards and their schools experience yearly.

The basis on which teachers participated in the LearnCanada project varied. The possibilities were to have a reduced workload, release time, or to volunteer. In the case of a reduced workload, teachers had teaching time removed from their timetable. In the case of release time this usually meant that a teacher could call a supply teacher as needed. Each board managed this internally and it varied from one board to another.

Almost half of the teachers (10) had both a reduced workload and release time while four of the teachers had only release time and two had reduced workload. One indicator of teacher interest is the fact that five of the teachers participated on a strictly volunteer basis. This is quite remarkable given the demand from the project participation on teacher's time.

The sections below provide the results of LearnCanada Project summative evaluation.

Teachers' evaluation of the Infrastructure used for Broadband Visual Communication in the LearnCanada project

The level of functionality of the broadband enabled learning environment that was developed and refined in the LearnCanada project was assessed by the teachers' level of satisfaction with respect to the various components making up the learning environment. The formative evaluation of the infrastructure in the earlier stages of the project allowed for the identification of the components considered being significant to the quality of the teachers' experience. These were clarity of the picture during transmission, quality of the sound, synchronization of the sound with the image, number of microphones and the configuration of the conference room.

Based on the formative evaluation questionnaires eight summative evaluation questions were asked to provide overall feedback on the infrastructure components at the end of the project. This was critical to capture given the constant evolution of the infrastructure throughout the duration of the LearnCanada Project.

The results indicate that despite a relatively overall good level of satisfaction across the items, there was still room for improvement for most of the infrastructure variables. This is in part due to having different equipment and infrastructure set-ups at different sites but also due to individual differences with respect to expectations of the technology.

Overall, the teachers evaluated the quality of the sound as better than the picture transmission (ability to see people at other sites). While over 50% of the teachers evaluated the picture as mostly high quality or consistently high, another 40 % evaluated the quality as sporadic and 10% evaluating it as poor. In comparison, the quality of the sound was evaluated as good to excellent by 70% a remaining 24% evaluated it as average and 5% as poor. The discrepancy between the picture and the sound may be a result of the use of different equipment from one site to another.

In the evaluation of the degree to which sound and image were in synchronization 70% of the teachers rated the environment as either usually or consistently in synchronization. The remaining 30% rated this component as being often out of synchronization.

With respect to the functionality and efficiency of the conference rooms used at the different sites, almost all of the teachers (95%) rated their room as average or very comfortable. Almost 60 % found the amount of space to work in as sufficient while 40% said it was somewhat crowded. Most of the teachers (over 70%) said that the number of microphones available was sufficient. The most frequently recommended number for teacher-to- microphone ratio is 2 to 1.

In examining the impact of the presence of the audio-visual equipment on the teachers' participation in the events, nineteen out of the twenty-one teachers reported that the equipment was not distracting or only occasionally distracting. The remaining two teachers reported the presence of the audio-visual equipment as extremely distracting. Despite some negative response to this question, the results certainly point to an amelioration since the beginning of the project. This could very well be due to teachers' having had the opportunity to work in such a rich technological environment for a long enough period of time allowing them to become more familiar with this kind of setting and functioning. An adaptation period, such as this one, is quite consistent with new technology implementation.

It is important to note that the teachers' evaluations coming from a same site varied in the rating of the quality. For example, the project saw three teachers at the same site evaluating sound as good by first teacher, average by the second and excellent by the third. This is most likely due to differences in individual expectations for the technological environment. These differences in evaluation however, impede the identification of a single, effective configuration. A much larger sample would be required to make this conclusion definitive.

Teachers' Evaluation of the video-annotation tool developed in the LearnCanada project

Another objective of the LearnCanada Project was the creation of effective multimedia objects and tools to support the professional development of teachers. To this end, a video annotation server was developed and refined and throughout this process, tested by the teachers. During the formative evaluation period of the video-annotation server, the teachers provided valuable feedback with respect to the functionality of this tool. Teachers made suggestions as to what they would like to be able to do with the video, how they would like to share the video, provide comments on the video, and discuss how to share best practice within their community.

As the LearnCanada Project progressed, so did the demands on the teachers-- and these demands came from many different sources. Following a small experiment in the development process where the teachers received training on how the tool worked, they were invited to capture some video of their teaching and post it on the server to eventually be shared. Several unexpected hurdles were encountered that included the teachers' being unfamiliar with how to capture digital video, their desire to edit the video without necessarily being familiar with editing tools and having the time in their busy schedules to do this task. The experiment was redesigned to allow the developers to get the formative evaluation needed to continue the development and refining process.

Hence, the summative evaluation of video annotation tool accommodated the hurdles encountered during the development phases and was designed to evaluate the potential use of such a tool for professional development purposes. The question therefore asked was "when the tool becomes fully functional would you make use of it for your ongoing professional development as a teacher?" Teachers were then given the opportunity to select the specific kind of use they would like, checking as many boxes as applied. The choices were a) to view captured videotape and annotate b) to capture new video and publish and c) I would not be interested to use the tool. For each item the teachers could provide further explanation.

The results indicated that almost half of the teachers (10) would like to view captured video and annotate it. Very few explanations were provided but at least one teacher saw the potential benefit of this tool and its role in school reform and project-based learning. Another half of the teachers indicated that they would be interested to capture new video and publish it. [Please note that the sum is greater than the whole as teachers could choose more than one option.] While the teachers are still requesting improvement in efficacy of the tool, it is interesting to see the relatively high number interested in capturing and editing video despite what this would ask of them in terms of their normal workload. One third of the teachers replied that they would not be interested in using the tool. From the explanations provided the two main factors are time available for using such a tool in a busy teacher's schedule and simply not feeling that this matches the learning style of the teacher.

A sample of the teachers' explanations provided for their choices of use or non-use of the video-annotation server are provided below.

Explanations provided for choosing "I would like to view captured video tape and annotate":

> "I believe this would be a positive way to look at teaching reform and more importantly explaining PBL [project-based learning] to students and other teachers."

Explanations provided for choosing "I would like to capture new video and publish."

> "This can be a very effective way to share strategies with colleagues, as long as the technology does not make it too difficult or time-consuming to use."

> "I would like to annotate my own video to illustrate what I intended for the particular lesson."

Explanations provided for choosing "No, I would not be interested."

> "Technical problems; doesn't quite mesh with the idea of broad-band on line streamed (i.e., live site to site) communication."

> "Not at this point. There is not enough time to film a class, edit the tape and upload it to the server. The value of what we see on the Annotation Tool is not worth the time it takes to access it. I would suggest the content should be a description of the project itself and ideas on how to best implement it. It would be impossible for a teacher with a full time teaching load to use the Annotation Server. The ease of use and reliability must increase significantly."

> "I find that I don't learn this way, so am not motivated to spend the time to work this way. A good tool, but not for me".

Teachers' evaluation of event formats designed for broadband visual communication technology

Throughout the duration of the LearnCanada project, the Instructional Design group was responsible for designing and experimenting with different conferencing event formats. Five different formats were used in the LearnCanada project. These were:

> **Telementor:** Having an expert come and address a particular subject to all of the sites.
>
> **Large group session:** All participants (in this case a maximum of 23) exchanging together as one group.
>
> **Large session with small group breakouts:** Same as above with the addition of subgroups breaking out to work in a smaller number.
>
> **Point-to-point on demand sessions:** These were conferencing sessions that were spontaneously requested by teachers working on a shared project.
>
> **Virtual classroom visitations:** These were one site broadcasts directly from a teacher's classroom to all the other sites.

The teachers were asked to evaluate the event format that they found the most useful for their professional development and the event format that they found to be the least useful for their professional development. Ranked in first place as the most useful event format was the Large session with small group breakouts. This was followed in second with Point-to-point on demand sessions and in third place with Virtual classroom visitations. The event format that was selected as being the least useful for professional development was the Large Group Session.

As the project advanced and the teachers and school board sites became more familiar with the operation of the equipment, the point-to-point event format sessions became increasingly popular. The teachers were explicitly asked to report the approximate number of point-to–point sessions in which they participated. Over 75% of the teachers reported participating in one to five sessions. As many as 20% of the teachers reported that they participated in more than ten. This increased use of this type of forum of visual communication can be seen as an indicator of the collaboration that was actually initiated and taking place among the subgroups of teachers across the country.

Teachers' Evaluation of the Professional Development potential of Broadband Visual Communication Technology

Teachers were asked to reply to two different questions with respect to the potential for professional development of broadband visual communication technology. The first question asked the teachers to report on the effect of participating in the

LearnCanada Project on their daily teaching methods. The second question asked the teachers what specific areas of professional development that they felt this technology would be most conducive to enhancing. The aim of these questions was to get a sense of the immediate impact of the project on the teachers' practice and to learn from their experience what they now consider to be the most effective use of this technology for professional development purposes.

Two-thirds (or 14/21) of the teachers reported that their participation in the LearnCanada Project had a significant effect on their daily teaching methods. The remaining one-third of teachers did not provide further explanation for their choice of a "no" response. Below are some examples of what the teachers provided as further explanation to their "yes" responses:

> "I am obliged on a daily basis to be aware of the larger perspective of topics. I am continuously looking for potential links to other participants in the project."
>
> "I have implemented more inquiry based learning projects in all of my classes, and I have started to bring other teachers with me to the 'dark side' getting them to do the same with their students."
>
> "I wanted to get more students involved in projects and I wanted get more cross-curricular collaboration happening so more teachers/ admin have been involved in what I'm doing in the classroom -it has made me much more aware of what I'm doing and aware of that fact that people are watching (in a good way)"
>
> "We designed a pilot course and very much enjoyed implementing this with our students. The PBL [project-based learning] course was a dream come true - as it provided much needed enrichment for the selected students involved."
>
> "I've refined many teaching techniques simply by discussing them with other teachers."

The teachers' responses to the second question for this section on professional development were overwhelmingly supportive for the use of broadband visual communication technology for professional development purposes. Ninety percent (19 / 21) teachers provided responses that identified multiple areas for professional development that this technology could enhance. The following sample provides illustration of the responses given by the teachers.

> "Because the technology allows the sharing of virtually any types of information, with virtually anyone in the world, there are really no limits to how teacher PD can be enhanced. This is the real power of the technology – We are no longer limited by time and distance. This project did not have to be about PBL, it could have effectively focused on virtually any aspect of teaching and learning."
>
> "National and international exchanges via this technology could be of tremendous benefit. 'A window on the world' if you like, or perhaps 'A window into the world's classrooms/schools' In addition, it would add to the knowledge/skill set of the teachers/students exposed to the technology."
>
> "Classroom structure and behaviour. I believe that this technology offers me the first real professional growth environment. Never before was I able to receive meaningful feedback on classroom behaviour. Never before was I able to carry on the discussion about my growth and how to become a better teacher. The greatest asset of this project is its potential to offer continuity in PD activities."
>
> "There are several areas that this would help. First, it allows great exposure to a lot of different pedagogies for classroom use. Second, it allows exposure to different methods of celebration of student work and achievement. Third, it allows exposure to different administrative and structural methods, allowing us to see what it is like to teach in different cities, provinces, etc. Exposure is the key - the more exposure to different teachers, the better your teaching is bound to become."
>
> "I think that teaching strategies are key to enhancing any curriculum and using this technology really forces you to use various strategies and share them with our colleagues. It is important to go through the trials and tribulations - we learn a great deal as we try new and innovative ways to implement curriculum expectations"
>
> "Learning to collaborate with other teachers – it is something that I have never done. It really is an opportunity to do things differently and with others. I'm tired of teaching the same way for so many years – I feel renewed thanks to being a part of the ID team."

Teachers' perspective on the Virtual Community developed in the LearnCanada project.

The summative evaluation provides considerable evidence that the teachers both worked with and learned from other educators from across the country. Several questions in the summative evaluation sought to evaluate the impact of participating in the LearnCanada project on the teachers' professional contacts, issues related to the sense of isolation in the profession and suggestions for enhancing a sense of belonging to a virtual community.

The teachers were asked to report specifically on their contacts in the LearnCanada project and the impact on their professional relationships. The teachers reported that had it not been for their involvement in the LearnCanada project, over 75 % of them would not have been in regular communication with a variety of teachers across the country. Those that contended that, despite the LearnCanada Project, they would still have been in contact with other educators said that this was related to professional activities such as the National Science Fair, use of the Internet and collaboration in an extensive network of colleagues/ friends who teach.

Participating teachers were asked about contact with several different categories of other professional contacts for the summative evaluation. These were teachers in their own schools, teachers in their city, province, nationally, in other countries, administrators and support staff. Results indicated that the teachers participating in the LearnCanada project had either more contact or the same contact with the different professional colleagues surveyed. More precisely, the teachers reported having more contacts with 67% of the teachers in their own school, 33% with teachers in their own city, 43% with teachers in their own province, 95% in their own country and 38% with teachers in other country. None of the teachers reported having less contact with any of the surveyed professional contacts after participation in the LearnCanada project.

In addition to a 95% increase in contacts at the National level, a further striking result was that 67% of the teachers had more contact with teachers in their own school. While this may not have been a barrier intended to break within the LearnCanada project, it is nonetheless a widespread barrier in most schools that has been identified as a source of concern.

With respect to the extent of the relationships built during the LearnCanada project, the teachers were asked if this project were discontinued, did they believe they would remain in regular contact with other participants. The results echoed the patterns of the contacts made that were reported in the section above. Sixty-seven percent of the teachers reported that they would on a national level and 52% reported they would on a local level. [The sum is greater than 100% as one could select more than one option.].

With respect to the isolation barrier so often felt by teachers and even more so by innovative teachers, 40% of the teachers reported that they felt that their participation in the LearnCanada project served to alleviate this feeling in their day-to-day work "considerably" and for another 40% "somewhat". The remaining 20% responded that it did not help to alleviate the sense of isolation in their day-to-day work. Therefore, the LearnCanada project suggests a possible viable solution to this barrier.

The teachers provided different accounts of what served to best enhance their own sense of belonging to a virtual community of teachers. Below are excerpts of what some of the teachers provided as being important for their participation in the community.

> "The fact that we had a central focus (PBL [Project-based Learning]) which was my pedagogical bent before entering the project. I no longer feel like an island preaching the benefits of this approach to other teachers who are overworked and sick of taking risks."
>
> "The opportunity for real-time dialogue makes it much easier to share ideas and strategies with colleagues, and to work collaboratively. In this way, teachers are more motivated and empowered to try new things."
>
> "The frequent point-to-point that I have been involved in has provided me with the feeling that I definitely belong to a virtual community of teachers. It has allowed me to share best practices and learn about schools (and their realities) that I would not have been given the chance otherwise. Even though we are geographically removed, we share many of the same ideals and face many of the same challenges."
>
> "My project work with some key champions of the project learning community has really helped out. I have not only joined this community as a learner, but I feel I have moved closer to being a champion myself. I have become much more comfortable with the process of implementing projects, and I have moved from an active participant to an active teacher in this area. As a result, I feel much more involved in this community, virtual or otherwise. I have also felt truly connected with one or two members of the community, and we have established connections that will last for much longer than the scope of the project. I have even gone so far as to enjoy coffee in the park with members of other provincial groups!"
>
> "The exchanges we were able to create during the learn Canada sessions were quite interesting. First of all, we were able to see the reality of every school in different provinces. Comparing to them we can see that we are living the same frustrations and good shows! Second, this technology has given us the opportunity to get students in different projects (in my case talented students who can learn in an accelerated form and are bored in the classroom) this technology gives them the opportunity to enhance greater abilities such as communication, getting information, research, compiling data etc."

Conversely, in response to an open question that asked what additions or changes to the project could have served to better enhance a sense of belonging to a virtual community of teachers, the most frequent response was to have "more on demand access". This speaks to the importance of the need for a technological environment that has an ease of access and simplicity of use. During the LearnCanada project the teachers demonstrated

tremendous perseverance and patience for this prototype environment. Now, at the end of the project, they are suggesting that the technology is in fact beneficial for their purposes but that they need it to be easier to access and use.

Teachers' perspectives on issues related to sustainability and dissemination of the LearnCanada project

The teachers were surveyed on four different potential indicators or factors related to sustainability and dissemination issues of the LearnCanada Project. These were--their desire to continue to have access to this kind of equipment in their careers, the identification of potential roadblocks for the implementation of their professional development model on a large scale, and the profiles of teachers that would best benefit and least benefit form this type of technology.

When asked if the teachers felt that the use of this technology would be sustainable on a long-term basis in their school, an overwhelming 85% replied yes. This response was supported even further by the response to the question of "In deciding to make a career move, would the availability of Broadband Visual Communication Technology at a school impact your decision to accept a job there?" The response was that for 71% it would. The responses to both of these questions provided evidence of the buy-in position of the teachers and their desire to continue further with this type of application of technology in their professional lives.

Without a doubt, the single greatest roadblock to the implementation of this professional development model on a large scale is time. Second and third in response were money and scheduling. A closer look at the notion of time that was incorporated in the teachers' responses helps to clarify more specifically these issues.

> "Time. I mean this in two ways: First, I believe that all teachers are taxed near the limit in terms of the time that they are given to do some unbelievable tasks. There simply aren't enough hours in the day to do everything that we are asked to do. Second, I think that time will allow for more teachers with technological savvy and a reflective approach to teaching that is very necessary for this type of project. Because Universities are using reflection as a major part of their education programs now, the new teachers coming out of the next few graduating classes will be much better equipped to pursue this kind of program. The technological roadblocks in this program proved frustrating - not every group had the technical ability to participate fully despite the full availability of access and equipment."

> "The 'time' to prepare those involved. (Especially when we have teachers of different technological abilities and differing amounts of experience with the 'program'.) And, the inability to 'control' contributions, commitment, and degree of participation of others."

> "Convincing the masses that the project is viable and worth the time invested. The project provides a vast array of resources to draw from."

> "Time. If teachers are to be involved in this type of PD activities, they need the time to do so properly. Without this time allocation, teachers simply show up for session without being able to drive the agenda forward. Most likely due to lack of time to structure and host sessions, we have be idled on many occasions. Time is costly, but I feel it is a worthwhile investment."

Also considered important for project dissemination, were the characteristics of a teacher who would best/least benefit from this particular use of technology for professional development purposes. To this end, the teachers, who now had experience in the LearnCanada project were asked to identify the characteristics for each of the best/least scenarios. The results are summarized below.

Characteristics of teachers who could best benefit from this type of technology were identified as

- Innovative/Creative
- Risk taker/Curious
- Open-minded/Flexible
- Technologically literate
- Bilingual

Characteristics of teachers who would lest benefit from this type of technology were identified as

- Traditional/Conventional
- Closed minded/Set in their ways
- Introvert/Independent
- Not flexible with curriculum
- Techno phobic

Teachers' overall evaluation of the LearnCanada project

This summative evaluation sought to capture the teachers' overall evaluation of the LearnCanada project. Four questions were asked focusing on different perspectives of the project. These were related to repeating the experience, the amount of time required for them to participate and, the "neatest" and "most annoying" things about their experience in the project.

An overwhelming 90% of the teachers said that in retrospect (i.e. if you knew then what you know now) if they were asked to participate in the LearnCanada project again they would. A remarkable high level of satisfaction is reflected in this number especially given the fact that in response to another question some 60% of the teachers reported that involvement in the project took "more time" or "much more time" than they expected.

The remaining 40% reported that it took the time they expected it to take.

Without a doubt for a majority of the teachers, the most commonly cited "neatest" thing about the LearnCanada project is the "connectivity" with teachers that are far way, across the country and even in the world. Two teachers characterized this perspective as follows:

> "The best thing about the Learn Canada project is that it opens boundaries. It greatly shortens the lines of communication between a very diverse cross section of people."

> "Sharing ideas with someone working in another school in another province as if there were in the room with you. And being able to do this as simply as checking your email."

The second and third most cited "neatest" things were the technology and the pedagogy. Sample quotes are provided below:

> "Perhaps the neatest thing is the broadband capabilities that we have in our school. It is incredible that we have the technology at our fingertips - we can be on-line with the other seven schools any time we want (the process of this is less intimidating now than before). Teachers pop in and are impressed with the sophistication of the technology - but then again, our teaching offices have computers and printers are pretty archaic."

> "Groups of teachers from across Canada discussing and sharing video clips of teaching practice. Collaborative curricular projects from across the nation. Students and teachers collaborating on projects and project based learning."

> "The opportunity for professional development in many areas – to work with other teachers in my subject area across the country and also to enhance my teaching as a technological professional with work I do IN my classroom and WITH my students. In too many ways, teaching is an isolating activity – even within our own schools. This 'shared' focus has been incredibly inspiring and refreshing to see what is going on in education in other areas (location-wise and subject-wise). It also gives us a self-assurance that we, as professionals, are on the right track."

In order to provide a balanced perspective, the summative evaluation inquired about the "most annoying" thing you would tell someone about their experience in the LearnCanada Project? Again, the responses were congruent with points raised in the different responses in the questionnaire. The most frequently cited items in order of frequency were technical problems, level of participation of teachers at different sites and time differences across the country. Below are excerpts of what some of the teachers had to say.

> "The most annoying thing would have been the time it took for everything to be at a point where smooth and easy access was consistent and the technology worked flawlessly....this, I recognize, is just a fact of life when you deal with any technology - I have learned so much in this respect."

> "The technical difficulties can be very distracting where by interrupting the flow-spontaneity of the session."

> "The technology. It is not consistent and takes a lot of time and effort. Booking a supply teacher and planning for an event and then having it fail due to the technology. It seems that the techies are not getting together as often as the ID team -why is that?"

> "The technological glitches, problems, barriers, etc. and people not using the time we did have together MOST efficiently during the conferences. People (other sites) not 'doing' their homework prior to the conferences so that we were all on the same page (e.g. preparation, motivation, accountability)"

> "The problems with the technology that put too much reliance on an already overburdened technical support staff who are not always able to meet our needs if they need to be somewhere else for another technical emergency."

Concluding remarks

This summative evaluation of the LearnCanada Project set out to capture a multi-angle perspective of the project. This was done by collecting feedback from the teachers that would reflect the multi-faceted nature of this research and development project. The integration of technology into education already has a growing history that reveals many challenges and barriers. Despite a high-tech environment, the project evolved into a very people-focused approach. As the technological problems moved into the background of the teachers' activities, the focus shifted more and more onto teachers' exchanging on practice in a continuous learning mode. So continuous was the desire to exchange and collaborate that as soon as the teachers gained control of the technological tools they quickly increased their number of point to point on demand sessions.

The learning culture developed by the teachers grew as the project evolved. The teachers demonstrated very strongly the potential uses of CA*net3 broadband connectivity for professional development purposes. Evidence of this is reflected in the many different formats developed to tackle the many different professional needs. Canadian K-12 educators collaborated to develop pedagogical expertise and innovative practice that they implemented in their classrooms. Towards the end of the project, the teachers were hosting events directly from their classroom and both teachers and students

were exchanging on nationally coordinated projects. Classroom exposure at this level is almost non-existent in the professional development literature. Participation in this kind of event supports both high quality teaching and high quality leadership in teaching.

In addition to the teachers' development of expertise, six school boards from four different provinces successfully implemented and used CA*net3 broadband connectivity. Infrastructure remains in place in many of the school boards and several of them

have moved onto or are moving into new projects using this broadband connectivity.

Overall, the vast majority of the teachers expressed, very clearly, the many different advantages of the LearnCanada Project for their professional development needs as well as their keenness to continue their path-finding work with technology.