An Innovative Model for Ontario North/South Program Delivery Project 2017-12

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Executive Summary

The goal of this cross-institutional partnership between Seneca College and Canadore College is to enable shared delivery of two advanced diploma programs currently offered at Seneca – Computer Programming & Analysis (CPA) and Computer Systems Technology (CTY). Through a formal partnership, the two colleges will create an innovative program delivery model that concomitantly provides a pathway to a Seneca degree: an Honours Bachelor of Technology in Informatics and Security (IFS), or an Honours Bachelor of Technology in Software Development (BSD).

This Seneca-Canadore collaboration aims to set the framework whereby larger Ontario colleges and smaller, non-degree granting colleges, can partner on program delivery. The shared program will promote sustainability through creative sharing of resources, to provide a highly scalable model that can be extended to other Seneca-Canadore program areas, and to other Ontario colleges and their communities. The capacity to provide a degree pathway is very important to smaller colleges, and further develops Canadore's ability to offer multiple entrance pathways and flexible policies and programming, with the focus on students who, without interventions and support, would not otherwise participate in postsecondary education (Canadore SMA 2017-2020). The proposed model will enable the College to achieve this goal without the significant investment of time and financial resources typically required to develop and implement a new degree program.

This initiative lays the foundation to support multi-directional student mobility to, from and within Seneca as part of Seneca's Strategic Mandate Agreement 2 (SMA2). The 'hub-and-spoke' model provides for seamless student mobility between Ontario's colleges. It will identify and map program pathways among institutions and provide learners access to the support they need to obtain their desired credentials, while also allowing institutions to share resources efficiently and foster student success

The Seneca-Canadore partnership will facilitate a deliberate, conscious and coordinated program planning process that will reverberate with social and economic benefits to students, colleges, and the province. The proposed initiative represents a unique opportunity for Canadore to meet workforce demands of the North, providing opportunities for students to gain the skills and knowledge that will strengthen North Bay's local and regional economies. To maximize student accessibility and success, the program will offer synchronous course delivery that combines in-class, online learning, and experiential learning opportunities. Where critical mass exists (e.g., common first-year courses, general education courses, communication courses), courses will be delivered face-to-face at the student's home institution.

To allow for maximum mobility between the CPA and CTY programs, first-year courses will be common where possible, and a bridging mechanism will be established to allow students the flexibility to transfer between programs. The proposed program will build on and benefit from the respective infrastructural and program strengths of Seneca and Canadore, thereby increasing opportunities for students in both regions and minimizing program delivery costs. While Canadore College benefits from the Seneca College's strength in IT curriculum and pathways through to degree completion, Seneca College also has the opportunity to examine several distance delivery models that have been in existence at Canadore

College for many years (Northern Colleges Collaboration Program, OntarioLearn, ContactNorth/ContactNord and Point-to-Point models).

The framework developed for synchronous delivery provisions two classrooms at Seneca, one for delivery of a course to Canadore and the other to receive delivery of a course by Canadore. Additional technologies to assist in student support for lab based courses is intended to include software that will allow the projection of an instructor's machine to student machines as well as the ability for the instructor to view a student's desktop in aiding troubleshooting and support of tasks being done by students. These technologies continue to undergo rigorous testing.

Project Purpose & Goals

The proposed Seneca-Canadore collaboration aims to set the framework whereby larger Ontario colleges and smaller, non-degree granting colleges, can partner on program delivery, a founding principal in the hub-and-spoke model to support student mobility. The shared program will promote sustainability through creative sharing of resources, to provide a highly scalable model that can be extended to other Seneca-Canadore program areas, and to other Ontario colleges and their communities. The capacity to provide a degree pathway is very important to smaller colleges. The proposed model will enable them to achieve this goal without the significant investment of time and financial resources typically required to develop and implement a new degree program.

The goal of the collaboration is to align program planning to enable shared delivery of two advanced diploma programs currently offered at Seneca – Computer Programming & Analysis (CPA) and Computer Systems Technology (CTY). Through a formal partnership, the two colleges will create an innovative program delivery model that concomitantly provides a pathway to a Seneca degree: an Honours Bachelor of Technology in Informatics and Security (IFS), or an Honours Bachelor of Technology in Software Development (BSD).

To allow for maximum mobility between the CPA and CTY programs, and where possible, first-year courses will be common, and a bridging mechanism will be established to allow students the flexibility to transfer between programs. The proposed program will build on and benefit from the respective infrastructural and program strengths of Seneca and Canadore, thereby increasing opportunities for students in both regions and minimizing program delivery costs.

Pathway Development

Methodology

The methodology that was developed for the project involved the establishment of a bi-lateral working group which met regularly to support the project, address curriculum planning issues, and identify and develop the ideal infrastructure to support the innovative curriculum delivery.

Regular conference call meetings were held as well as face-to-face visits with tracking of activities through appropriate project tracking and documentation. Additional resources were engaged, as appropriate, to clarify and confirm aspects of the delivery of this new model. These resources included, but were not limited to: Admissions, Registration, Faculty, Information Technology Services and outside vendors to review technology for synchronous delivery as well as vendors to investigate/acquire technology to support the infrastructure for a longer term delivery vision.

The key tasks/deliverables for the project were:

Date	Task/Deliverable
April 7, 2017	Sign Memorandum of Understanding
April 7, 2017	Establish a bilateral Working Group to meet regularly to support the project, address curriculum planning issues, and identify and develop the ideal infrastructure to support innovative curriculum delivery.
April 7, 2017	Design and implement appropriate communication mechanisms between the two colleges, including mechanism for reviewing project progress.
April 28, 2017	Analysis of respective infrastructure strengths and how best to build on this foundation.
August 1, 2017	Determine course development adjustments required for consistent course delivery.
September 1, 2017	Identification of existing supports for student success. Identify student advising process. Identify gaps and required remediation.
November 1, 2017	Research and develop co-op opportunities in the North Bay region (proximity to Canadore)
December 1, 2017	Obtain internal and external programmatic approvals as required.
February 15, 2018	Identification of indicators to track and monitor the success of innovative program delivery model, and to identify opportunities and constraints.
March 15, 2018	Finalize academic plan for implementation.

The kick off held in April 2017 included key players from both institutions to conduct introductions with the key team members and to clarify/confirm project objectives and timelines and to determine frequency of meetings, communications and reporting on progress. This set the stage for follow-on meetings which were held to work around faculty availability and other disruptions that took place.

Through May, Seneca shared an inventory of all curriculum showing for each course, a link to the materials for courses that are not delivered through a Learning Management System, the evaluation structure and the technology required for each course. This was used as a basis for discussions moving forward for determining which courses could be delivered synchronously and by which institution. This inventory package was expanded to include course outlines, weekly schedules and program maps to present clearly how courses are sequenced.

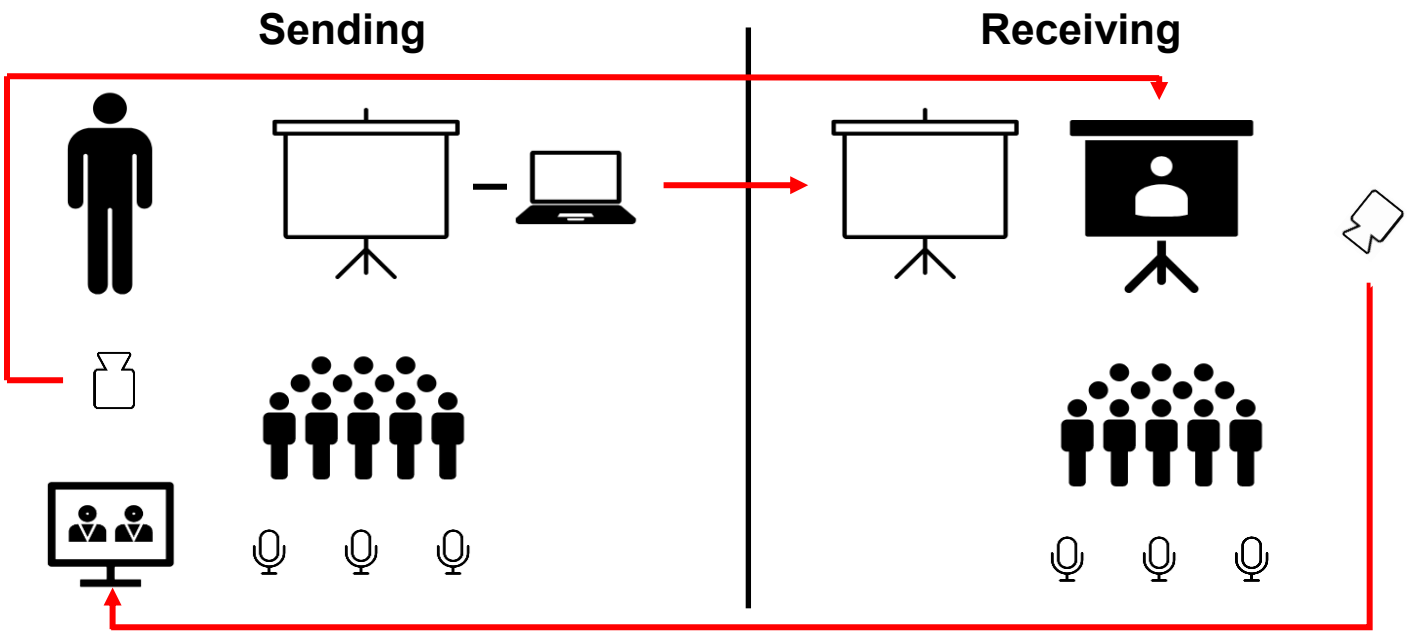
In addition, a demonstration took place at Canadore in early May on BigBlueButton (BBB). This was conducted by Blind Side Networks. A faculty member from Seneca was present at Canadore and Seneca. While this demonstration was technically challenging, Seneca worked with, and continues to work with Blind Side Networks and the Information Technology Services group at Seneca and Canadore to ensure the stability of delivering using the BBB software. At the same time, and continuing now, alternate synchronous conference delivery tools continue to be investigated for course delivery. This has led to a demonstration of Saba, the platform used by Contact North to deliver online courses amongst northern Ontario Colleges and will subsequently involve investigating newer product offerings.

The infrastructure required for synchronous delivery was researched and identified through August and September. It was determined that sending and receiving classrooms would be equipped, initially at Seneca to test the synchronous delivery model. In our deliberations, we were mindful of the need for program sustainability, and considered existing technologies and infrastructure throughout our discussions. The following equipment was identified:

- Sending classroom:
    - A podium computer connected to a wired network with a webcam. This webcam would be used to view the faculty. A second monitor is required to stage course materials/technologies to be used during class delivery. This allows these additional teaching materials to be quickly deployed (for sharing with Receiving location) so as not to disrupt the flow of the delivery.
    - A wearable microphone for the faculty to ensure the voice quality is consistent.
    - A graphic pad/pen for the faculty to write on a BBB virtual whiteboard. This pad will attached to the podium computer. It was suggested that a dedicated camera be focused on the classroom whiteboard if faculty were not comfortable using the pad attached to the podium computer. It was later determined that the quality of the image from the camera projecting the white board would not adequately transmit so this option was not considered.
    - A projector to show the output of podium computer on a big screen.
    - A second project that receives the feed from the remote classroom, positioned at the back of the sending classroom for the faculty to view the remote classroom.

- Receiving classroom:
    - A podium computer connected to a wired network.
    - A project to receive the feed from the sending classroom projected on a big screen.
    - A powerful microphone with multiple 'arms' to be placed among the students in the remote classroom. This is to ensure that students in the receiving classroom are able to ask questions to the sending classroom and be heard.

The send/receive technology model for this initiative is presented in the following diagram.



Preliminary testing using portable technology was conducted beginning in December and identified the following to be addressed when the permanent infrastructure is in place and involve a variety of resources to be involved in finalizing procedures. The order for the permanent equipment to support the sending and receiving platform at the Seneca campus was placed in November. At the time of this report, this permanent equipment had not been received and testing at the Canadore location had not yet been completed. See Appendix A for equipment configuration.

The following section outlines items that will continue to be investigated as the project moves to implementation:

- Infrastructure
    - To support delivery of lab content, a tool such a Faronics Insight was tested which allowed faculty to connect with a student's workstation in a remote lab location, have a conversation with the student while viewing their workstation, control their workstation

and message it. As every course in the CTY and CPA program has a lab component, this functionality will be important to be able to support the student effectively from a sending location. Further rigorously testing is needed to test various scenarios and unique course needs and deliveries.
    - Seneca use a software deployment platform called MyApps, a portal that allows software to be streamed to a desktop, rather than having to install and launch the software on the desktop. Based on the software used in courses, licensing issues will have to be determined for delivering courses from Canadore.
- Delivery
    - Procedures for ensuring students have access to materials at the sending institution have been identified.
        - Receiving institution provide list of students who are participating in the synchronous course to the Sending institution
        - The Registration Office at the Sending institution adds students to the course. For first time students, this will involve creating student id's and email addresses for them.
        - Upon completion of the course, the Sending institution sends the grades to the Receiving institution who will then add the grades to the student's record.
    - As Canadore will only have a cohort intake in September, procedures for students who fail a course will need to be developed but initial suggestions in discussion are:
        - Deliver synchronously from Seneca the same course to the students who have failed when offered the following semester
        - Take a comparable course through Ontario Learn
    - The uniqueness of Seneca's three year advanced diploma programs, with an introduction in the first two semesters to the skills needed for two diverse careers in Information Technology - systems and networking administration and software development (programming), requires, from the first semester, courses that are unique to each program to teach the appropriate foundational skills minimizes the ability to make all courses common in the first year.
- Co-Op
    - While co-op was initially listed as one of the tasks, in conversations with Canadore, their previous delivery mode of this program was an unpaid internship in the third year so co-op as part of this initiative was not pursued or developed.
- Student Support
    - In analyzing the resources required to support students at the 'receiving' end of the delivery, several approaches are being considered, including those making use of the services of ContactNorth/ContactNord as well as the possibility of providing Technician and/or Technologist support at the 'receiving' end.

Program comparison and analysis

Larger Ontario colleges and smaller, non-degree granting colleges, can partner on program delivery. The shared program will promote sustainability through creative sharing of resources, to provide a highly

scalable model that can be extended to other Seneca-Canadore program areas, and to other Ontario Colleges.

In this project curriculum will be delivered synchronously. As the CTY and CPA programs at Seneca College are well established, all course delivery can be done using existing course materials, developed by Seneca. In addition, pathways from these diplomas to degree offerings in Seneca's School of Information & Communications Technology can be supported, meeting existing transfer requirements.

Students, upon successful completion of appropriate program will be able to pathway to degree programs at Seneca. The highest affinity pathways are as follows:

- Three year advanced diploma program in Computer Systems Technology (CTY) to Honours Bachelor of Technology – Informatics & Security
- Three year advanced diploma in Computer Programming & Analysis (CPA) to Honours Bachelor of Technology – Software Development.

Implementation process and timelines

Just prior to the submission of this report, curriculum was finalized for year one – courses to be delivered by Seneca synchronously to Canadore and Canadore to Seneca. Seneca's curriculum is being made available to Canadore to facilitate the delivery as Canadore have not offered either of these programs in recent years.

There are still approvals pending from Canadore to confirm technology to deliver. Additionally, full functional testing of the synchronous delivery has yet to be completed.

Consideration of asynchronous delivery has not yet taken place, as the focus has been on ensuring a viable and effective synchronous model.

Summary of Pathways(s) Created

Existing pathways exist for each three year program to either the Honours Bachelor of Technology – Software Development, Honours Bachelor of Technology – Informatics & Security and Honours Bachelor of Commerce – Business Technology Management (for Computer Programming & Analysis advanced diploma only). No new pathways were created.

Promising Practices and Lessons Learned

This collaboration will continue to be developed. The methodology followed, guided by a project plan was sufficient but would have benefited from the guidance of a resource experienced in these types of collaborations. Further effort should also have been expended to investigating technological solutions for actual course delivery as alternatives to BigBlueButton (BBB). Testing of synchronous delivery was not completed at a rigorous level to identify, mitigate and document procedures for actual ongoing execution of this type of collaboration. There could still be challenges with quality of bandwidth to sustain quality delivery of courses but without the rigorous testing in a classroom and/or lab setting, not all potential challenges have been recognized.

As an initial project for this type of collaboration, the resource commitment required to develop and deliver this was under-estimated. More resources dedicated to this project would have ensured a more successful completion. Resources such as faculty, service areas (particularly the technology services staff) to do more investigation and research into existing solutions as well as to conduct more rigorous testing would have enabled the project to complete in a timely manner.

The prototype testing done shows promise in the ability to delivery courses synchronously in a manner conducive to student success. Availability of robust curricula will allow the startup of new cohorts at remote institutions to be done in a timely manner, reducing the need for them to recruit a large number of qualified faculty as Seneca will be able to deliver well established programming synchronously. Smaller institutions will be able to deliver programming synchronously to Seneca students where their expertise is a fit.

Financial Report (as a separate document)

See separate document attached.

Appendix A

Equipment specifications for sending and receiving rooms.

Below is the updated list for BBB trials. This covers systems for both rooms in portable racks that can be shipped around for demos. We will require that the rooms being used for the demo have had AV upgrades within the last two years and are using HDbaseT controlled projectors.

Manufacturer	Model	Purpose	Qty	Comments
PTZoptics	PTVL-ZCAM	Stationary camera for Canadore room	1	Equipped with a wide angle lens, to be mounted above projection screen in Canadore room.
PTZoptics	20x-SDI	Robotic HD Camera for Seneca room	1	To be mounted on the wall at the back of the Seneca classroom. Will move to presents selected by instructor.
Crestron	DSP-860	Audio DSP for Canadore room	1	This will take in the wireless mic and array of ceiling microphones and output a clean feed to the capture card.
Crestron	DM-TX-201-C	Transmitter for Camera in Seneca room	1	This extends the video and control signals for the Seneca camera from the podium to the location it will be mounted.
Crestron	DMPS3-4K-300-C	Main matrix switcher and processor	1	This will handle all room control, video switching, lighting control, and audio amplification in the Seneca room.
Crestron	DSP-1280	Audio DSP for Seneca room	1	This will take in the wireless mics and array of ceiling microphones and output a clean feed to the capture card.
Crestron	HD-DA2-4K-E	HDMI splitters	2	Splits the two outputs of the desktop computer. One feed will go to the podium monitors and the other to the classroom video switcher.

Crestron	TSW-1060-B-S	10” touch panel	1	Touch panel to control microphones, camera presets, room lighting, and basic AV functionality in the Seneca room.
Crestron	TSW-1060-TTK-B-S	Touch Panel Stand	1	Allows touch panel to sit on a desk
Audio Technica	AT875R	Wired Microphones	4	A pair will be placed on stands within both classrooms during the trial to pick up students. For final installation these will be swapped with ceiling microphones.
NEC	E232WMT-BK	Touch screen computer monitors	2	Touch screen computer monitors connected to the computer as an HID. This will fulfill the virtual whiteboard requirements and is not software dependant.
Matrox	Mojito Max	PCIE capture card	2	Converts the high quality video and audio streams coming from the external equipment into a “webcam” feed that can be used by any computer applications
BRTB	TXBB-25	Cable for remote classroom camera	1	To be used for remote classroom camera. Will be replaced with in-ceiling cabling for final install.
Duracat	Duracat-50NBNB	Durable cat6 cables	2	To be run to the TV and camera at the back of the Seneca room. Will be replaced with in-ceiling cabling for final install.
On Stage Stands	UM01	Mic stand adapter	1	Will mount remote classroom camera onto a mic stand
Tether Tools	RSMA12	Mic stand adapter	1	Will mount Seneca camera onto a mic stand
ProX	T-8RSS	8u Rack for remote equipment	1	Rack case for remote room. Will protect equipment for shipping and allow the system to be portable.
ProX	T-16RSS	16u Rack for Seneca equipment	1	Rack case for Seneca room. Will protect equipment for shipping and allow the system to be portable.
Furman	FURMAN M-8X2	Rack surge protection	2	Rack mount sure protection

Neutrik	NC3FXX	XLR connectors for wireless microphones	3	XLR connector for wireless microphone pigtails
Neutrik	NBB75DFGB	Neutrik BNC Panel connector	2	SDI I/O panel connector
Neutrik	NAHDMI-W	Neutrik HDMI connector	3	HDMI I/O panel connector
Neutrik	NE8FDP-B	Neutrik Ethernet connector	6	Cat5 I/O panel connector
Neutrik	NC3FD-L-B-1	Neutrik XLR connector	4	XLR I/O panel connector
Neutrik	NAUSB-W-B	Neutrik USB Panel Connector	4	USB I/O panel connector
Gator	GRW-PNLUNIKO	Gator rack panel	2	I/O panel for rear of each rack to be populated with above connectors
Generic	3u rack shelf		2	To secure tower computers into the two racks
Chief	K1C220B	Dual VESA monitor mount	1	Podium dual monitor mount for Seneca room.

Equipment to be provided from existing event and spare inventories (alternatives will have to be purchased for the final installation):

6x Microphone stands

2x Wireless handheld mics

1x Wireless clip-on mic

4x XLR mic cables

1x Crestron TXRX h.264 streamer

1x Portable TV on a cart

To be purchased or swapped in for other components during final install:

1x 85” NEC display with HDbaseT card

12x Ceiling microphones

1x 16u Permanent rack

1x Spool each of ceiling rated SDI and microphone cable with termination equipment

12x Neutrik XLR connectors

1x Rack mount UPS

1x Larger AV POE switch

1x AODA compliant table

2x Camera ceiling mounts

2x Crestron SSW “Mic active” signs

1x Crestron DGE-100 video overlay module