The State of Integrating Academic Upgrading into Pre-Apprenticeship Programming in Ontario's Colleges

Final Report

College Sector Committee (CSC) for Adult Upgrading
with Durham College of Applied Arts and Technology

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1. Introduction

A. Background Information

This report is part of the project *Integrating Academic Upgrading into Pre-Apprenticeship Programming*. The overall goal of the project was to ensure that pre-apprenticeship students receive an Academic Upgrading (AU) component that is tailored to their trade and appears seamless with the trade component of their program.

The CSC partnered on the project with Durham College of Applied Arts and Technology and its pre-trades Electrical Technical – Instrumentation & Control program. We use the term "pre-apprenticeship" to include Ministry of Training, Colleges and Universities (MTCU) funded pre-apprenticeship programs as well as the one to two year postsecondary pre-trades or technical programs that are offered through Ontario's community colleges. We also use the term "integration" to refer to partnership work between AU and Apprenticeship. The partnership work refers to how AU is planned and delivered as part of pre-apprenticeship programming.

B. Purpose of this report

The purpose of this report is to outline the current state of integration between AU and Apprenticeship for Pre-Apprenticeship programming along with the effective practices that are being used at the faculty level. The information in the report will also be useful to those AU faculty who support apprentices through AU during the in-school training component of their apprenticeship.

2. Methodology

We collected information for this report in two ways:

- by Survey Monkey with AU leads in all 24 of Ontario's community colleges
- through telephone interviews with 10 AU faculty who were experienced in integrating AU into pre-apprenticeship programming

A. Survey Monkey

We received 34 responses to the Survey Monkey. The survey questions focused on:

- Pre-apprenticeship programming offered and whether or not there is an AU component
- AU subjects taught and time spent on AU within pre-apprenticeship programming
- Trades focused on
- Assessment
- Collaboration between AU and Apprenticeship
- Successful integration strategies
- Challenges in integration work

B. Interviews with AU Professors

Ten interviews were conducted with AU faculty from seven community colleges across Ontario. All professors had experience tailoring AU to the trades. This experience varied from college to college. Participants for the faculty consultation were mainly drawn from colleges that had participated in a previous CSC project: *Making the Business Case for Integration among Employment Ontario Programs and Services.* The project presented seven case studies representing excellence in integration.

These professors' experience in tailoring AU to the trades included a focus mainly on math and communications (reading, writing, document use, oral communication) with the majority teaching math. The major trades they worked with for pre-apprenticeship, pre-trades and apprentice support included Cook (2), Arborist, Electrical technician/apprentice(2), Plumbing(2), Auto service technician, Metal fabrication worker, Welder and Horticulturalist.

Some professors taught in programs generally geared to helping students prepare for a trade of their choice. Some professors also provided upgrading support to apprentices during their in-school training.

3. Findings

The overall state of integration in Ontario's community colleges is based on the survey with AU leads across the colleges as well as some interview findings. The effective practices section is based mainly on interviews with AU professors experienced in integration.

A. Overall State of Integration in Ontario's Colleges

Over 80% of survey responses indicate their colleges offer pre-apprenticeship programming and integrate AU into that programming.

Generally, the AU component of pre-apprenticeship and pre-trades courses is offered upfront before other courses or offered at the same times as the trades-specific areas. In some cases, there are voluntary math upgrading programs offered at night or during the day where students and apprentices can get extra support. In cases where math upgrading is voluntary, attendance was cited as sporadic. In cases where the AU component is offered upfront, tutoring may also be available for the students for the rest of their trades program.

Part of the AU component may be preparing students to get subjects for credit through ACE or preparation to get the GED.

Just over 40% of survey responses showed that their colleges offer more than 40 hours of AU in pre-apprenticeship programming. Other responses indicate that respondents offer less than 20 hours of AU as part of the pre-apprenticeship program. The most common subjects included in AU are Math and Communications (reading, document use and writing). To a lesser degree, Computers, Science subjects, English, Self-management, Self-direction and Success strategies may be offered as part of the AU component.

Pre-apprenticeship trades

The most common trades included in pre-apprenticeship programming with an AU component are:

- Cook*
- Construction Craft Worker*
- Carpenter*
- Automotive Service Technician*
- Plumber
- Industrial Millwright
- Sheet Metal Worker
- Truck and Transport Technician

The trades listed below are included to a lesser extent:

- Baker
- Construction Electrician
- Electronic Technician
- Machinist
- Metal Fabricator
- Partsperson
- Heavy Duty Equipment Technician
- Industrial Electrician
- Instrumentation and Control Technician
- Refrigeration and Air Conditioning Service Technician

Student profile

Overall, AU faculty interviewed work with a wide range of ages. Many faculty members reported that they tend to work with males who do not have their Grade 12 or have a general Grade 12. These students may have failed school or had challenges with math, reading and writing. They were described by one professor as “doers.” In other cases, professors work with women at risk, or students from First Nations.

Several professors specifically noted that they work with older adults. In many cases, students face personal and employment barriers and may be considered “at risk.”

Collaboration between AU and Apprenticeship

The majority of respondents from AU note they have a least a little collaboration with Apprenticeship. Just less than a third say they have a lot. Almost everyone would like to see more collaboration with Apprenticeship.

Respondents' comments indicate that continued collaboration with Apprenticeship is necessary and more collaboration is always good. The need for more collaboration and communication appears to be dependent on the length of time AU has been involved in pre-apprenticeship programming. For example, those just starting out in pre-apprenticeship programming know better what collaboration should look like in the future. Others with a great deal of experience and time invested in integration have well-established partnerships and feel they have enough collaboration. Whether more collaboration is necessary is dependent on the context of the particular college. Comments suggest that collaboration should happen only as needed given time and funding constraints.

The nature of the collaboration varies. It may include planning and discussion before a program, joint faculty work to review training outcomes and develop curriculum, accountability on both sides built into the program, or joint administration. AU generally plans the AU content and delivers it based on the needs of the particular groups. At the same time some responses show that AU may be brought in after the fact or are only told how much time they will have for AU.

Assessment for Pre-apprenticeship programming

The results from the survey show that there is no one preferred method of AU assessment for pre-apprentices. The most common ways of assessing these students include:

- In house assessments
- An interview
- TOWES and an interview
- CAAT

Most professors interviewed indicated they use a placement test to initially determine the priority areas for their students' trade-related AU needs. Often these tests have been developed "in house." They tend to focus on math and reading and writing. In other cases, the Test of Workplace Essential Skills (TOWES) or Evaluating Academic Readiness for Apprenticeship Training (EARAT) is used. Professors also consult with students themselves to find out where they are struggling and with employment practitioners and trades faculty to determine needs. Assessment of needs is ongoing and AU professors tend to consult with trades professors to determine these ongoing needs *vis a vis* what is being taught in the trades component. Some comments indicate that testing causes anxiety and stress for the students.

Overview of Successful strategies

The most successful strategies for the integration of AU with pre-apprenticeship programming include:

Communication and collaboration between AU and Apprenticeship

This success strategy was the most prevalent strategy given by AU respondents. Some examples of collaboration that worked included:

- regular drop ins from the apprenticeship coordinator to the AU classroom so students could feel connected to where they were going
- a pizza lunch so students could meet AU and Apprenticeship faculty
- cross program faculty teams
- having the AU coordinator also as the pre-apprenticeship coordinator
- having AU be involved in the intake to get the right candidates for the pre-apprenticeship program
- close relationships among the two departments—both faculty and management (built over a long period of time)
- regular meeting and review times

Use of trades relevant materials in the AU component

This strategy was also at the top of the list. Comments included the need to:

- embed real trades skills and language
- use context specific activities
- use trades-specific curricula
- customize for the trade

Embed the AU component with the trades component

Survey participants suggested the importance of offering shop skills with the AU curriculum, and having the practical component tied to the AU component, or delivering the AU component concurrently with the trades component. One comment was,"Keep activities (AU) parallel to the lab work."

Offer a credential as part of the pre-apprenticeship program

Another successful strategy indicated by some respondents was to offer either ACE courses or the GED as part of the pre-apprenticeship program so students can get their high school equivalency. One person indicated that getting postsecondary credit as well as AU worked well.

Choosing the right AU faculty

Having the right AU faculty to work with the right group is extremely important

Challenges

The most common two challenges identified in the survey of colleges were resistance on the part of students to the AU component and learning the skills of the trade to make the AU component relevant to the trade.

Other top challenges in integration work between AU and Apprenticeship include:

- making ACE material trades related but staying true to AU outcomes and high school equivalency
- finding trades related materials
- working with apprenticeship faculty and managers
- lack of time, resources and space for delivery
- showing students how AU links to their pre-apprenticeship trades component
- students who are mandated to take AU but already have the skills
- addressing the range of needs expressed by learners
- students being served by two different departments
- the last minute system of awarding funding for programming
- getting the right AU faculty
- timelines to complete upgrading requirements

AU faculty interviewed also identified a number of challenges in developing an AU trades-specific component. These challenges mirror the challenges identified in the survey with AU leads.

Lack of knowledge of the trades

Several professors noted that lack of knowledge of specific trades is a challenge. One person indicated that even with a great working relationship with trades faculty it is still difficult to put together an AU curriculum for a trade you know nothing about.

Another person said that a challenge is not knowing the terminology of the trade and not being a hands-on person. He would like to see workshops, and professional development opportunities to visit the trades areas. AU faculty involved in supporting apprentice programming need to think of things as work-related rather than academic.

A third person indicated that the learning topics especially if they are working on ACE credit are not connected to the students' next steps of learning within the trades. There are not a lot of options because the curriculum is set. He would like to be able to refocus materials so it is applicable to the work the students will be doing specific to their trade. He suggested that there be fewer AU math modules so the students can focus on trades-related math.

A fourth professor indicated that in order to overcome lack of knowledge about the trade, he focuses on what they are missing from the trades component. He feels that as he becomes more familiar with the trades and works more with trades instructors it will become easier. He believes that it is not necessary to have the background in the trades as long as trades instructors provide the materials they are using in class. He is able to pick the material apart to find the relevant math questions. He also noted that the trades instructor for carpentry brought a few of the students who had failed math to him for help. The professor brought their tests and he was able to see where they were having trouble. He was able to work on foundations skills using EARAT to help them pass their tests.

Input from trades faculty

Not enough input from trades faculty can make it difficult to tailor AU programs to the trades. One comment indicated that there needs to be a way to have trades faculty see the relevance of combining math with other courses. This professor would like to learn how to create trades-related materials to use when teaching foundation skills.

AU materials

Several people said there was a lack of materials to use for trades related upgrading. One person indicated that it is important to make dry material exciting and entertaining, with a need to think outside the box.

Time constraints

Lack of time with students and their time constraints was mentioned as challenging.

B. Effective practices from AU faculty

The findings from AU faculty on effective practices include the following topics:

- process used to design and teach AU for the trades
- examples of specific strategies
- outcomes of a trades-related AU component
- topics to include in a how-to manual to promote effective practices

Process used to design and teach AU for the trades

Many AU professors interviewed noted that in order to successfully design and teach AU for the trades it is important to work with trades faculty, meet with them regularly and use the materials they are working with to prepare and teach trades-related math foundations and communications. Most AU professors work with trades faculty to find out gaps and what content is being covered in the trades program. One professor noted, "It is important to have communication with the trades instructors because it keeps you current on what the students are learning."

AU faculty, generally, focus their upgrading on program priorities within the trades. They indicate to the students that these are the areas that are required by the trades program. They use these materials to design the foundations math or communications tailored to the trades and the workplace for their students. Some faculty indicated that they would like to see more meeting time with apprenticeship faculty. Meetings can be difficult when AU and Apprenticeship are not in the same location.

Some faculty are in the process of building closer working relationships with Apprenticeship. One professor noted that she has no real involvement with trades faculty at this point. She would like to meet with her colleagues to identify learning needs that they are seeing in their classes. Without this contact, it is difficult to pull together interesting materials.

AU faculty also work with the students to find out where they are struggling and conduct assessments with these students. Faculty emphasized that it is important to demonstrate how math is applied to the trades so it is relevant for the student. The foundations skills learned need to be put into "task-based practice." One comment indicated that it is important to get away from academics and link AU to the real world of apprenticeship and work.

Other important teaching strategies are to work students at their own pace and show them many different ways of doing things. It's important to do things in many different ways to accommodate people's learning styles. Some students prefer to work on the computer to do these activities. Patience and understanding are important as are repetition and practice.

Examples of specific strategies

One professor interviewed described the ongoing process of working with trades faculty throughout an integrated program. The AU professor and trades faculty worked as a team to develop the course outline, and the AU faculty member isolated the essential skills needed by the students. She was able to determine the vocabulary and terms needed by the students and could speak to what the trades professor was doing. She was also able to reinforce the teaching of essential skills by the trades instructor. This team approach worked very well.

Another professor had his students create a documentary on one of the topics in the apprentice curriculum in the communications course. The students had to write and present research as part of the activity. It was not a sitting down activity, and the students had to go off site to conduct interviews. Such an activity builds confidence and touches on many learning styles through the different activities.

Still another professor indicated that "the tradesperson is skilled, but does not know how to teach math; the AU instructor knows math but not the trade." The AU professor is able to break the math down then work through the components with the students. The professor notes that it helps that he is a math teacher and not a tradesperson because he can show the students how to arrive at an answer using various math applications. He also uses practical visuals to provide context for the math. For example, he might have students draw a roof and calculate the slope or draw a picture to see how the math is applied. He notes the importance of showing the students math tricks and how math can be fun.

One professor has students do oral reports on topics related to their trade and document use related to what they would experience at work. These reports help them become familiar with jargon related to work.

Materials that are useful in tailoring subjects like math and communications to the trades are Math for the Trades and Elementary Technical Math. Several professors identified Skillplan materials, EARAT materials, and trades textbooks as helpful as they are geared to the trades.

Outcomes for students and apprentices of a trades-related AU component

AU faculty indicate that the main outcomes for students and apprentices is that they are more successful in passing their trades courses and they are more confident. They also indicated that that they are receiving more requests to help students from trades instructors. One professor stated that employers are receiving students positively and that improvements are shown through pre and post tests and portfolios.

C. Topics to include in a "how to" manual for AU professors

Topics that AU professors would like to see included in a handbook to promote effective practices are:

Cycle of pre-apprenticeship and apprenticeship

AU professors would like to know how the whole cycle of apprenticeship and pre-apprenticeship works and where in the cycle students and apprentices struggle.

Materials

A priority for AU professors centres round trades-related upgrading materials. They would like to see tips and examples of how to develop and make upgrading materials trades related. They would like to know how to make this material exciting and interesting and have it address real life needs in the trade and on the job. They would also like a bibliography that includes trades-related math materials, other Essential Skills materials, handbooks that are currently available, key contacts and relevant web sites. They would like to find out where they can go to find out more about a trade and new trends in trades. Job descriptions would also be helpful in terms of showing students how they will use skills on the job.

Process for working with the trades and creating trades-related materials

Another priority is to have a step-by-step process for working and communicating with the trades and then creating trades-related upgrading material and working with students. Faculty needs help in working with trades professors to show them the importance of upgrading especially communications (reading and writing). This is

especially important since communications is not a high interest subject. AU faculty want to know what information they should get from trades instructors and in what areas students tend to struggle. For example, important information to gather from the trades would be the course outline, and textbooks used.

Working with students

AU professors want to know more about the learning styles of their students and how to excite them about learning and use different approaches with them. Also helpful would be why current AU practices don't work with these students and how to have less of a focus on paper and pencil work. A conference or workshop in this area would be beneficial. Also useful would be alternative assessments that use workplace examples and enable students to complete tasks to show what they know.

4. Summary Statement

The findings show that there is a great deal of integration of AU into pre-apprenticeship and pre-trades courses in Ontario's colleges. At the same time there is a need for more communication and collaboration between AU and Apprenticeship faculty at both the departmental level and between AU and Apprenticeship faculty. Collaboration and good communication between these two areas was identified as the most important effective strategy for integration work and critical to offering trades-related AU.

While AU faculty identify both effectives processes and strategies for integrating AU into pre-apprenticeship programs, they acknowledge that both a lack of knowledge of specific trades and trades-related AU materials is still a challenge. They would like to see a process for developing trades-related materials and more trades-related AU materials.

We believe that the handbook *A How-to Guide for AU Professors: Integrating AU into Pre-Apprenticeship Programs* developed as part of this project addresses the needs and concerns at the AU faculty level voiced in this research.