Experiences with Blended Learning Program Delivery for Apprenticeship Trades: A Case Study

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Abstract

In many trades the demand for training seats has strained the conventional delivery capacity of training providers in Canada. Manitoba, along with other Canadian provinces is experiencing a shortage of skilled tradespersons required to enable current and future economic expansion. Due to the deficiency in the skilled labor force, a community college in Manitoba designed, developed and delivered an alternate model of program delivery for apprenticeship trades education comprised of distributed learning using blended learning methodology. The objective was to realize fruition by employing the use of an online blended delivery model as an alternative to traditional block release training typically comprised of 8-10 weeks of face-to-face instruction at a community college. The delivery objectives focused on creating course content that could be delivered through the Internet to any apprentice regardless of location. The model would permit apprentices living in remote northern regions to remain in their communities to complete their level training as opposed to leaving family and community to complete their training at one of Manitoba's technical colleges. This case study is founded on the requirement in the project Request for Proposal to collect data for continuous improvement purposes for subsequent component development and/or delivery. The data indicates that apprentices identify the opportunity to remain at home in their community to take their level training as the programs greatest strength. The challenges associated with designing, developing and delivering a blended model of apprenticeship training center around institutional engagement, subject matter expert availability and instructor preparedness for using technology for teaching and learning. This case study is significant as the literature is void of empirical data pertaining to an alternative model of apprenticeship training in Canada.

Keywords: Skilled trades, Blended learning, Apprenticeship, Instructional design, Subject matter experts, alternate models of program delivery.

1. Introduction

The Conference Board of Canada has identified a skills shortage across Canada with implications that pose a serious threat to the competitiveness of Canadian industries and participation in the knowledge economy (Antunes, 2013). Therefore, it is important that leaders in higher education understand the link between international competitiveness, post-secondary education and a skilled labor force (Partnership for 21st Century Skills; The Council of the Federation). Industry Canada perceives that the speed of adjustment in market requirements for skilled labour depends on how the post-secondary education system responds to the volume and type of skills required (Government of Canada). Predicting future skill requirements and job markets is challenging due to the tenuous nature of the labour market information used to forecast approaching demographic changes (Miner, 2014).

In many skilled trades, apprenticeship training is an essential stage to becoming a skilled tradesperson (Employment and Social Development Canada). Apprenticeship is an agreement between an individual (an apprentice) who is interested in learning a skill and an employer who requires a skilled worker. Apprenticeship combines practical on-the-job experience with technical classroom training. Following the successful completion of the classroom and on-the-job training, apprentices can attain Journeyperson Certification or a Certificate of Qualification, which offers opportunity for better employment and increased employment mobility across Canada. Approximately 80% - 90% of the training occurs in the workplace and the remainder is completed at a training institution. Currently there are over 300 apprenticeship-training programs across Canada (Employment and Social Development Canada). Registered apprenticeship numbers in Canada more than doubled between 1991 and 2009, rising from 192,945 to 409,083 (Statistics Canada).

1.1 Statement of the Problem

What is unknown or understood to a lesser degree is how the post secondary education system is responding to the volume and type of skills required for a skilled labour force. Understanding how post-secondary education systems are responding to the increased demand for skilled labour in the province is important within the larger scope of Canadian tertiary education (Canadian Apprenticeship Forum, 2004). For example, in some jurisdictions it has been reported that educator's may hold a bias towards the trades and apprenticeship technical training which may contribute to insufficient funding for apprenticeship training opportunities at the post-secondary level. The infrastructure of the apprenticeship system may also deter educators and other stakeholders from providing apprenticeship training. It is important for educators and well as stakeholders to identify barriers to accessing, maintaining and completing apprenticeships as most studies perceive educators as a primary influencer on participation in trades careers (Canadian Apprenticeship Forum, 2004).

1.2 Purpose or Aim

The purpose of this study is to examine the experiences of individuals invested in designing, developing and implementing an alternative hybrid blended model of apprenticeship technical training combining traditional face-to-face instruction with online independent learning modules and virtual classroom instruction. The development and delivery of this model was seen as a solution for Manitoba to increase the output of trained apprentices. The model was developed based on classroom space shortages and the magnitude of a building project sufficient enough to accommodate what was anticipated as a need to double the number of apprentices pursuing training in their chosen trade; time and cost made space–based solutions prohibitive (Leading Solutions Consulting, 2008). A blended model of apprenticeship training was proposed, approved and underwent development and implementation. This case study examines the experiences of various individuals involved in the project.

2. Review of Related Literature

Blended models of online learning have been defined as, "The organic integration of thoughtfully selected and complementary face-to-face and online approaches and technologies" (Garrison & Vaughan, 2008, p. 148). Canada's Collaboration for Online Higher Education and Research (COHERE) established in 1999 notes that in comparison to entirely online learning, blended learning is still relatively new and emerging (Matheos, 2011). Although blended learning practices in Canada are burgeoning, challenges and barriers may thwart the benefits of alternative models of program delivery. For many instructors the transition from traditional face-to-face classroom instruction to that of a blended experience is not easy (Cook, Owston & Garrison, 2004). Garrison and Vaughan (2008) note that blended learning must be approached with an awareness of the challenges associated with shifting paradigms concerning teaching and learning. A clear organizational definition of blended learning is required in order to avoid ambiguous permutations of face-to-face and online instruction (Picciano, 2009).

Currently researchers are asking probing questions about how to plan, design and implement meaningful learning experiences for blended learning (Beetham, 2005). Bernatek, Cohen, Hanlon and Wilka, (2012) focused on the usefulness of case studies for comparative analysis and making meaningful decisions about blended learning practices. A reoccurring theme in the literature indicates that effective practice criteria need to be developed (Beetham, 2005; Bernatek et al., 2012; Bates, 2011; Cook, Owston & Garrison, 2004). As technology is changing the service delivery options available to learners, course and program developers are eager to understand how to best meet the needs of online learners. Currently there is no pedagogical model for online learning that developers can apply to all aspects of designing, developing and implementing online learning alternatives; a continuous dialogue about the development process is required (Beetham, 2005).

Post-secondary online/blended learning initiativesrequire considerable investment in terms of commitment from participating stakeholders as well as auxiliary investments in learning management system interface to amalgamate in-person and online learning (Kvavik & Caruso, 2004). While many institutions have adopted the use of learning management systems to support online/blended learning, very little is known about how these systems are being used and if they are helping instructors change their customary classroom practice (Morgan, 2003). Folinsbee (2008) sought to answer questions about how to ensure online learning alternatives are effective and successful. The author reviewed key documents over an eight-year period noting, "Online instructors need advanced technological skills, more patience than the traditional classroom [instructor] and the ability to develop confidence and comfort with students" (p. 10). The findings emphasize the need for patience and "experimentation to determine what works . . . and training and support for both faculty and students" (p. 18). Folinsbee noted that one of the most significant problems with online learning is the high student turnover even though the number of enrollments has increased; there is little information on why learners drop out. The overall literature on e-learners is relatively recent and anecdotal

providing little empirical data predicting learner success (Folinsbee, 2008). There is an absence of research concerning what digital natives, or the generation born digital has to say about online learning (Bennet, Maton & Kervin, 2008). A recent much acclaimed study by the Pew Research Center presented results of several studies that investigated opinions and perceptions surrounding online learning; however, provided limited evidenceof students' perceptions (Parker, Lenhart & Moore, 2011).

Computer mediated instruction has been faulted for technical problems, inadequate student/instructor interaction, and ambiguous course instructions (Hara & Kling, 1999).A report by Means, Toyama, Murphy, Bakia and Jones (2010) provides a comprehensive review of e-learning literature from 1996 – 2008 using over a thousand empirical studies. The Meta analysis combining results from multiple experiments found that on average students in online learning environments performed modestly better than those receiving the same instruction in face-to-face environments. The results were attributed to blended conditions where learners received additional learning time and instructional elements not received by students in face-to-face environments. The findings suggested that the "positive effect associated with blended learning should not be attributed to media" (p. ix), rather the incorporation of mechanisms that promote student interaction, reflection and level of understanding (Beetham, 2005). Means et al. (2010) caution that literature on e-learning has generally been provided by practitioners who conducted research based on their own practice; the various experimental situations are ad hoc rather than theory based. The field of online learning lacks a coherent body of studies that test theory based approaches in different contexts (Means et al., 2010).

Cook, Owston and Garrison (2004) collected data from eight out of ten COHERE member universities and found that blended learning practices vary from a single course to an entire degree. The research indicated that faculty resistance, student reluctance, insufficient technical support and the absence of a clear institutional plan along with appropriate leadership support are the primary challenges associated with online learning. The resistance to blended learning however, is not as intense as resistance to fully online learning due to its' combination of mixing the familiar with the unfamiliar(Niemiec & Otte, 2010) Faculty resistance to blended learning has been associated with the perception of increased workloads amid already existing substantial workloads and an unwillingness to change existing practice (Alabamian& Troudi, 2010; Guri-Rosenblit, 2009; Ocak, 2011; Vaughan, 2007).

Changes to existing instructor practice have the potential to be realized by the provision of ongoing technological support for faculty throughout the design, development and delivery process of blended learning program delivery as such initiatives are more time consuming than preparing for face-to-face instruction (Cook, Owston & Garrison (2004). Folinsbee (2008) noted, "Online instructors need advanced technological skills, more patience than the traditional classroom [instructor] and the ability to develop confidence and comfort with students" (p. 10). The author observed that blended learning projects have largely been the result of uncoordinated separate innovations designed to meet the needs of students and there is a significant absence of institutional awareness of and support for these initiatives. The two main issues associated with institutional challenges center around the need for clear policy concerning goals for blended learning that align with the mandate of the institution and the lack of appropriate leadership to support and sustain blended learning initiatives (Cook, Owston & Garrison (2004). An absence of statistical data on blended learning in Canada has amplified the challenges associated with assessing Canadian practices (Bates, 2011).

3. Method

The purpose of this research study was to investigate the experiences of individuals associated with designing, developing and delivering an alternative model of program delivery for apprenticeship trades using an online hybrid blended approach incorporating traditional independent online learning, face-to-face and virtual classroom instruction. Qualitative research methodology was chosen as it lends itself to the use of in-depth participant interviews using open ended questions to elicit as many details as possible from the informant; participants can answer from their own frame of reference, freely expressing their thoughts and feelings (Bogdan & Knopp Biklen, 2006). Qualitative research methodology seems to be an appropriate method of inquiry for documenting the experiences and recommendations of individuals associated with designing, developing and delivering an alternate model of program delivery for apprenticeship trades technical training. The team of individuals involved in this effort included apprentices, apprentice supervisors, instructional designers, instructional design technicians, subject matter experts, online instructors, department chairs and coordinators as well as project managers. The collection of the data occurred through audio-recorded one-on-one face-to-face interviews with participants in May and June of 2013 at a college in Manitoba Canada and in a remote northern provincial location.

3.1 Recruitment of Participants

The recruitment of participants for this study occurred following approval from the community college Institutional Research Ethics Board. Once approval had been granted, participants were invited through an e-mail that articulated

the purpose of the study and the research questions. The invitation for participation clearly identified that participation in the study was voluntary; it detailed the time commitment required for participation and ensured anonymity. All of the apprentices who participated in the interviews for this study were unfamiliar to the primary researcher; there were ten male and two female ranging in age from 20 - 40. Of the seven supervisors in the remote northern location, six were unfamiliar to the primary researcher. The seventh supervisor had been instrumental in assisting the primary researcher with making arrangements for the interviews. The remainder of the participants (seven) were all known to the primary researcher; the total number of participants numbering 28.

3.2 Researcher Bias

Every researcher has their own biases and it is important that these biases be recognized at the onset of a research project. Creswell (2009) believed the researcher must attempt to reduce the influence of any prejudgments and past experiences. It is the researcher's responsibility to remain neutral and unbiased during the data collection process and analysis (Kirby, Greaves & Reid, 2007). Prior to the commencement of the participant interviews for this study in May and June 2013, all participants were informed of the primary researcher's position in the study and history with the blended learning project in an endeavor to promote disclosure and transparency in the research.

3.3 Theoretical Framework

The research question, "What are the experiences of individuals invested in designing, developing and implementing an alternative hybrid blended model of apprenticeship technical training" was viewed through the lens of constructivism. Constructivists believe that that there are multiple representations of reality and they examine how human beings construct knowledge from information generated through their experiences (von Glasersfeld, 1996). This lens relates to the research as it proposes to ask individuals invested in developing and implementing a blended model of apprenticeship training about their experiences. Information generated from the construction of these individual experiences will foster a deeper understanding of the topic, as the information will result from each individual's activity and constructive reality. Constructivism is a good theory to use, as the lens is relevant for examining the knowledge that has resulted from active personally constructed experiences by individuals who have given meaning to their experiences. Maxwell notes "What people believe and perceive is shaped by their assumptions and prior experiences and the reality that they interact with" (p. 43). This research examines the reality of individuals invested in designing, developing and delivering a blended model of apprenticeship training.

3.4 Research Questions

The primary overarching research question for this study was, "What are the experiences of individuals associated with designing, developing and delivering an alternative model of program delivery for apprenticeship trades"? The project stakeholders generated the following specific questions for project managers:

1) What is the optimal hybrid mix for delivering an alternate model of technical training?

2) What are the best practices for adapting or selecting instructional material to support innovation in program delivery?

3) What knowledge does the project provide about the screening and selection of clients who are most apt to benefit from an alternate model of program delivery?

4) What are the development and production considerations for an on-line delivery initiative?

5) What are/were the strengths and weaknesses of the project design?

6) What would you do/not do again?

7) What would you change about the project approach?

The following specific questions for apprentices, apprentice supervisors, instructional designers, instructors, subject matter experts, department chairs and coordinators were also generated by the project stakeholders:

• Tell me about your experiences in this project.

• What are the strengths of blended learning program delivery?

• What are the weaknesses of blended learning program delivery?

• What are your recommendations?

3.5 Transcription, Data Management and Technical Analysis

Raw data from the audio files from the one-on-one interviews was transcribed using Transcript Divas academic transcription services (http://transcriptdivas.ca/). Once the transcription of the audio files had been completed, the transcripts were sent by e-mail to interview participants for member checking. Member checking is a technique used in qualitative research to ensure the accuracy and credibility of data. The process provides participants with an opportunity to view the transcript of their interview and either affirm, or not affirm that the transcript of the audio recording reflects their views, feelings and experiences. The overall goal of this process is to provide findings that are authentic, original and reliable (Creswell, 2009). All but one of the participants in this study verified the accuracy of their interview transcript.

3.6 Data Analysis

Not all researchers select the use of the word 'analysis' when examining research data. Hycner (1999) notes that the word 'analysis' usually means to break something down into parts, which may result in loss of meaning of the phenomenon; he suggests the word 'explication' of the phenomenon keeps the context intact (p. 161). Coffey and Atkinson (1996) define analysis as the "systematic procedures to identify essential features and relationships" (p.9); it is a way of converting the data through explanation. This data analysis used a systematic simplified version of Hycner's explication process that comprises of five steps or phases:

- Bracketing and phenomenological reduction. Audio recordings of each interview were reviewed numerous times to become familiar with the interviewee's words and to develop a holistic sense of the entire interview (Holloway, 1997; Hyener, 1999).

- Delineating units of meaning. Units of meaning were extracted from each interview and redundant units were eliminated (Moustakas, 1994).

- Clustering units of meaning to form themes. Units of meaning were examined in order to elicit the essence of meaning in the entire context. Units of meaning were grouped together (King, 1994; Moustakas, 1994).

- Summarizing each interview, validating and modifying. A summary was prepared incorporating all the themes elicited from the data to create holistic context.

- Extracting general and unique themes from all the interviews and creating a composite summary. Common themes and variations of themes were identified in the interview (Hycner, 1999). Themes in the data emerged and a composite summary was created (Hycner, 1999; Moustakas, 1994).

4. Results

The findings are presented in two distinct sections in order to succinctly answer the primary research question: "What are the experiences of individuals associated with designing, developing and delivering an alternative model of program delivery for apprenticeship trades"? First, the responses of project managers; second, the responses of apprentices, apprentice supervisors, instructional designers, instructional design technicians, subject matter experts, online instructors, department coordinators and chairs.

4.1 Participant Experiences: Project Managers

4.1.1 Question #1: What is the optimal hybrid mix for delivering an alternate model of technical training?

The optimal hybrid mix for delivering an alternate model of technical training for apprenticeship trades is a moving target. The mix that was created for this project with an expected 10 hour a week commitment from the apprentices split up into six hours in a virtual classroom with the instructor and four hours of online independent learning coupled with a capstone at the end is a mix. What a mix would look like would depend on the trade to some extent. Some trades lend themselves well to a blended online distance cohort and some trades do not. The optimal mix seems to be something that allows apprentices to work the learning in with their regular schedule and commitments. Entire programs in apprenticeship trades do not lend themselves well to total online or blended delivery. However, there are certain units within any level that can be done online and it should possible to do an entire level within a larger program. The optimal mix is context specific.

4.1.2 Question #2: What are the best practices for adapting or selecting instructional material to support innovation in program delivery?

Articulating a definition for best practice proved to be a challenging task for interview participants. Respondents replied by reiterating the question, "What are best practices"? Ultimately respondents indicated that best practices vary by program, trade or unit. This iteration of online alternative delivery endeavored to mimic what learners experience in

a face-to-face program. However, assuming that learners are recipients of best practices in a face-to-face program at a technical college may be a false assumption. Best practice most likely includes ensuring the learner is able to operate at a maximum level of self-sufficiency through the provision of learning supports. It also means frequent assessment to confirm that the learner is aware of their progress at every cycle in the learning. You cannot assume something is a best practice based on one experience; you have to do it numerous times to determine what best practices are.

4.1.3 Question #3: What knowledge does the project provide about the screening and selection of clients who are most apt to benefit from an alternate model of program delivery?

Experience with this project confirmed what the team already knew about online or blended learning for apprenticeship trades; blended learning is not for everybody. It requires a certain level of skills and dedication that are not typical. Early on the SmarterMeasure (SmarterMeasure) assessment tool was recommended to the program for the purpose of gauging whether an individual is ready to learn online. SmarterMeasure is a good screening tool; it tests certain skills, and demonstrates what it is like to sit in front of a screen, concentrate and organize oneself according to computer-based instruction. The qualities of each individual apprentice also play a significant role; specifically possessing an aptitude for learning with technology and dedication to learning.

4.1.4 Question #4: What are the development and production considerations for an online delivery initiative?

The most important development consideration for this project was getting committed and sustained subject matter expert time to collaborate with instructional designers to develop content. This can be attributed to departments who were already tightly scheduled and did not have available instructors to work on additional projects. Due to the difficulty in obtaining subject matter experts to work on lesson content development, progress was hampered from the start. Once secured to work on content development, the team also learned that subject matter experts varied considerably in their commitment to the project. Some of them had the skills, aptitude and enthusiasm for online/blended learning while others did not.

There was also a lot of pressure on instructional designers who suffered from not knowing the subject themselves and needed to adapt apprenticeship trades education into an online format. Instructional designers need to be able to look at what is required in every lesson in terms of text, video, simulations and assessment to determine the optimal mix of instruction. An instructional designer also needs to be chameleon-like when navigating the world of trades and then morphing to the language of administration to show up at stakeholder meetings. The largest delivery consideration was training subject matter expert instructors to teach online. Every instructor who did teach online went through a very steep learning curve adapting his or her teaching instincts to an online environment.

4.1.5 Question #5: What are/were the strengths and weaknesses of the project design?

The principal strength of this project was creating content delivery for a whole level of apprenticeship training at a time as opposed to piecemeal development. At the onset of the project costing for subject matter experts was projected based on one or two subject matter experts responsible for developing an entire level of training. As work on the project progressed, it was determined that each level of training required at least three and often as many as six or more subject matter experts. Consequently, there were challenges procuring subject matter expert time from departments. Frequently, when subject matter experts became available it did not align with instructional designer availability. The overlooked opportunity to be seen as an institutional initiative was also a major weakness in the project design.

4.1.6 Question #6: What would you do/not do again?

The use of lesson logs proved valuable in collecting data for content development. They were a way for instructors to keep a daily record of what had been taught in a face-to-face lesson. Lesson logs provided databases that lead the instructor through a number of questions regarding lesson format. Done correctly they could also be used in a pinch to develop the deliverable.

4.1.7 Question #7: What would you change about the project approach?

Communication regarding the launch of the project as well as on-going communication about progress was limited. Subsequent blended learning initiatives would benefit from a stronger communication piece from administration that fosters institutional ownership and buy in from all stakeholders. Subsequent blended learning projects would also benefit from using subject matter experts more as instructional designers.

4.2 What apprentices, apprentice supervisors, instructional designers, instructional design technicians, subject matter experts, online instructors, department coordinators and chairs had to say about the online development and delivery initiative.

Due the number of interviewees and interview questions for this research, the responses to all four-interview questions

for this group of participants have been combined. Some of the questions procured more robust responses than others. It was the primary researchers perception that some of the interviewees may have been restrained in their responses. The interview questions were:

- Tell me about your experiences in this project.
- What are the strengths of blended learning program delivery?
- What are the weaknesses of blended learning program delivery?
- What are your recommendations?

4.2.1 Apprentices

Previous experience with online learning was reported as beneficial by all apprentices, however, not essential; apprentices generally reported a steep learning curve and a feeling of being overwhelmed for most of the delivery process. The apprentices with families described difficulty in finding a quiet space for study. Computer based learning was especially challenging for visual learners; a request for more visual experiences became a re-occurring theme. Apprentices reported an appreciation for instructors who used web cameras and recorded sessions that could be reviewed succeeding instruction. Supplementary instructor support following a virtual classroom session was also related as being extremely valuable. The pace of delivery was described as brisk with many apprentices struggling to keep up with assignments.

Apprentices related that the ultimate strength of the delivery model was in the opportunity to remain at home and in community as opposed to leaving family in the remote northern part of the province to attend training at a technical college in the southern part of the province. When emergencies arose and an apprentice needed to remain at home or at the hospital to care for a family member, the blended model allowed the apprentice to log into the virtual classroom remotely. Weaknesses in the model were attributed to the delivery of the program over too long a period of time (nearly six months). The lengthy period of program delivery interfered with workplace, community and family events. Communication with instructors was also noted as a weakness of the delivery model as some instructors were perceived as unapproachable. Apprentices were unanimous in their recommendations to shorten the duration of program delivery; they also noted that program delivery needed to be more polished as instructors lacked adeptness with the communication tools in the virtual classroom and the learning management system.

4.2.2 Apprentice Supervisors

Apprentice supervisors reported overall satisfaction with the blended delivery model. However, the duration of the program delivery was noted to interfere with apprentice workplace, community and family events. Apprentice supervisors agreed that the best feature of the blended model was the opportunity for apprentices to remain in their community. Glitches in the online delivery such as setting up the technology, inconsistent use of the web camera, unpredictable availability of recorded sessions and students' difficulty communicating with instructors were seen as major weaknesses. Recommendations were to shorten the duration of the delivery model and improve communication between apprentices and instructors.

4.2.3 Instructional Designers and Technicians

Instructional designers and technicians reported working with subject matter experts to develop courses for the project as the most challenging. Everything needed to be developed from scratch; there was a feeling of frustration due to an absence of understanding for how much time was required to create each course for the program and tight deadlines prevailed. Instructional designers and technicians reported that there were times when they were unable to move forward with content development due to the unavailability of subject matter experts. A major weakness in the project as a whole was identified as a deficiency in adequate communication between project stakeholders.

4.2.4 Instructors

Instructors reported being unprepared for delivering program content; it was a steep learning curve and a lot of preparation was required. While some training had been provided prior to delivery, the experience was reported as overwhelming and learning occurred through trial and error.

4.2.5 Subject Matter Experts

Subject matter experts acknowledged that it required a lot of hours to develop a program for a blended delivery model. Unanimously, they noted concerns about the limited amount of face-to-face instruction and the perception of copious amounts of self-teaching with the online independent learning modules. Several subject matter experts made

recommendations for online instructors to collaborate with the subject matter expert(s) who developed the course/program.

4.2.6 Department Chairs and Coordinators

Department coordinators and chairs reported releasing instructors from regular scheduled face-to-face instructional responsibilities for the purpose of creating programming for an alternate model of program delivery as the primary challenge associated with participating in the project. Similar challenges were also reported concerning the scheduling of instructors for the online/blended delivery. Coordinators and chairs also reported significant stigma surrounding the model of program delivery, as many instructors do not believe that technical training for apprenticeship trades can be delivered online. The chairs and coordinators were unanimous in their recommendation to shorten the duration of program delivery and provide more support in the way of technical training for online/blended instructors. An alternate model of program delivery was identified as an entirely new experience for traditional face-to-face instructors.

5. Discussion

The purpose of this study was to examine the experiences of individuals invested in designing, developing and implementing a blended model of apprenticeship technical training. The qualitative data in this research corroborates with the findings of other researchers who are asking probing questions about how to plan, design and implement blended learning experiences (Beetham, 2005; Bernatek et al., 2012; Bates, 2011; Cook, Owston & Garrison, 2004). The data offers rich authentic information about the issues and concerns associated with engineering an alternative program delivery model. The research is significant as post-secondary institutions search for solutions to expand access to programming through blended learning delivery models (Bates, 2011). The reoccurring themes in the findings align with previous literature that indicates the need to develop effective practice criteria for making meaningful decisions about blended learning practices (Beetham, 2005; Bernatek et al., 2012; Bates, 2011; Cook, Owston & Garrison, 2004).

5.1 Contribution to the Knowledge

The research questions used in this investigation were designed by the stakeholder group for the purpose of informing subsequent design, development and delivery of blended learning initiatives for apprenticeship trades. The primary research question, "What are the experiences of individuals associated with designing, developing and delivering an alternative model of program delivery for apprenticeship trades," has been answered through the rich qualitative data collected through open-ended questions. The research data provides information about trends, issues and concerns associated with blended learning program delivery and aligns with the literature and previous research.

5.1.1. Project Managers

Project managers stressed the importance of institutional communication from senior levels of administration regarding the launch of a new model of program design, development and delivery. The importance of institutional ownership and buy-in from all stakeholders simply cannot be overstated (Morgan, 2003; Beetham, 2005; Picciano, 2009). Designing, developing and delivering an online alternative model of program delivery requires consideration regarding the diversity inherent in each trade and at every level within a trade. Consideration must be given the availability of committed and sustained subject matter expert time. It should also be anticipated that subject matter expert attitudes will vary in terms of commitment to a project development initiative which in turn results in considerable pressure on the instructional designer who is responsible for adapting apprenticeship curriculum into an online format.

5.1.2 Instructional Designers and Technicians

Instructional designers and technicians reported working with subject matter experts to develop course content as the most challenging aspect of program development due to subject matter expert (un)availability and tight deadlines. Major weaknesses in the design, development and delivery of the current initiative were identified as inadequate communication between stakeholders, a one-size-fits-all approach with regards to course look and feel and an over-extended commitment to produce an alternate model of program delivery within an unrealistic time frame. Instructional designers and technicians recommend a flexible approach to developing alternative programming, constant re-evaluation of the processes and enhanced communication between stakeholders.

5.1.3 Subject Matter Experts and Instructors

The literature is void of empirical data describing the experiences of subject matter experts and instructors involved in a blended learning initiative. The information garnered from this research notes that subject matter experts and instructors are sceptical about the concept of blended learning for apprenticeship technical training. Instructors also

reported feeling unprepared for delivering instruction in a virtual classroom even though some training had been provided prior to delivery. These findings align with the literature by Cook et al. who noted that the transition from face-to-face classroom instruction is not easy for instructors. These findings also corroborate with Garrison and Vaughan who noted that blended learning must be approached with an awareness of the challenges associated with shifting paradigms concerning teaching and learning. It is important to consider that online/blended instructors require advanced technological skills and the gift of time to develop confidence and comfort with students in an unfamiliar learning environment (Folinsbee, 2008).

5.1.4 Program Coordinators and Chairs

The review of the literature for this research did not discover any empirical data recounting the experiences of program coordinators and chairs associated with the design, development and delivery on a blended model of program delivery. This research provides a departure point for other researchers interested in examining the experiences of others embarking on such an endeavor. The stigma reported by program coordinators and chairs as associated with a blended model of program delivery supports the previous findings by Cook et al., and Garrison and Vaughan. Moreover, the stigma associated with blended learning may also be influenced by the perception of increased workloads and unwillingness to alter existing practice (Alabamian& Troudi, 2010; Guri-Rosenblit, 2009; Ocak, 2011; Vaughan, 2007).

5.1.5 Apprentices and Apprentice Supervisors

Throughout the blended learning initiative for apprenticeship trades, instructors, subject matter experts and apprentice supervisors expressed concerns regarding a perceived absence of robustness in a blended delivery model as well as apprentice success passing formative and summative evaluation. The attrition rate in the program initiative was zero and all of the apprentices passed their evaluations with grades equal to or superior to apprentices in face-to-face classroom environments. These findings align with the Meta analysis by Means et al., who noted that on average students in online learning environments perform modestly better than those receiving the same instruction in a face-to-face environment. The authors attribute these results to additional learning time and instructional elements not received by students in face-to-face environments although these positive effects should not be accredited to media, but rather the incorporation of mechanisms that promote student interaction.

5.2 Future Research Directions

Clearly, further research on the experiences of individuals associated with designing, developing and implementing alternativeblended learning models of program delivery is needed to determine optimal ways to plan, design and implement meaningful learning experiences for blended learners. Qualitative inquiries, such as the case study presented here may enhance our knowledge of the experiences of individuals associated with the growing trend of providing non-traditional ways for all learners to meet their professional goals. Yet, more studies are needed in order to expand our understanding at various levels of blended learning design, development and implementation. Additionally, further research should include longitudinal studies over a period of time with apprentices (orother learners) who accomplish successful completion of more than one level of training through an online blended model. Furthermore, future research should include quantitative investigations focusing on comparable or measureable variables to identify similarities and differences in the experiences of participants over a broader geographical region.

5.1 Recommendations for Practice

1) Institutions must have a clear communication plan concerning blended learning program design, development and delivery.

2) Blended learning program development must ensure the availability of subject matter experts.

3) The duration of a blended learning initiative must consider context and audience.

4) A flexible approach must be taken when developing an alternative delivery model as a one-size-fits all approach is not realistic.

5) Action must be taken to ensure that all virtual instructors receive adequate training and on-going support to ensure polished program delivery.

6. Conclusion

This research has examined the experiences of individuals invested in designing, developing and implementing an alternative model of apprenticeship technical training. It is evident from the research that there are many individuals with diverse roles directly or indirectly invested in developing a blended model of program delivery. The research may

suggest practical implications for organizational communication plans, reasonable expectations and timelines for program development and continuous dependable access to subject matter experts. The data in this research has also shown the necessity and importance of advanced technical training for online instructors. Researchers must continue to ask probing questions about how to plan, design and implement meaningful learning experiences for all learners in blended learning environments. Moreover, the post-secondary community must find ways to address faculty reluctance to incorporate technology into their teaching and learning practice.

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