

Running head: BEHIND THE BARRIERS

Mount Saint Vincent University

Department of Education - Graduate Studies in Lifelong Learning

Behind the barriers: Factors that influence adult learners' struggles with consistent attendance and mathematical achievement

by

André Michael Labelle Davey

A Thesis

submitted in partial fulfilment

of the requirements for the degree of

Master of Arts in Education (Lifelong Learning)

September, 2017
Halifax, Nova Scotia

© André Michael Labelle Davey, 2017

ABSTRACT

Behind the barriers: Factors that influence adult learners' struggles with consistent attendance and mathematical achievement

Two barriers that continue to face adult learners on their path to accreditation are inconsistent attendance and mathematical limitations. The purpose of this research study is to determine the significant issues that influence the barriers in attendance and mathematical achievements that adults attending an adult learning program in Halifax, Nova Scotia encounter.

A record review of 188 adult learners in an urban Nova Scotia Adult Learning Program confirms that inconsistent attendance is a barrier to timely academic achievement. To further explore the intrinsic intentions behind these two barriers, an online survey is used to identify some of their contributing factors. Of the 125 learners invited to participate, 26 respondents provide a voice for the adult learners who may feel that the manner in which their academic upgrading has been made available does not always offer the necessary support to suit their needs.

DEDICATION

I would like to dedicate this thesis to my family. If it were not for my wife, I would not be where I am today. Her desire to pursue her Masters fueled the desire to pursue mine. She has been my rock throughout this process. Our two young boys are our driving force, our reason for being. The pursuit of academic excellence is something I wish to show them by example.

ACKNOWLEDGEMENTS

I would like to acknowledge all of the adult learners who have chosen to upgrade their skills. From cradle to grave, we are all learning through life. The decision to commit to a Master of Arts in Education, involving the completion of this thesis, came with careful consideration. Many instructors within Mount Saint Vincent University's Department of Graduate Studies in Lifelong Learning have played an important role in getting me this far. Dr. Donovan Plumb has acted as both a guide and mentor throughout my time at the Mount. Dr. Susan Brigham, Dr. Genevieve Boulet, Dr. Krista Ritchie and Scott McPhail provided me with the necessary encouragement during the course of my studies. The final journey to complete my thesis would not have been possible without the dedication and support of Dr. Eva Knoll and Dr. Danielle Cox.

TABLE OF CONTENTS

Dedication	iii
Acknowledgements	iv
List of Tables	vii
List of Figures	viii
Chapter	
1. INTRODUCTION	1
Purpose of the Study	3
Statement of the Problem	4
Methodology	5
Limitations	5
Definition of Terms	6
Organization of the Remainder of the Thesis	7
2. LITERATURE REVIEW	8
Inconsistent Attendance.....	8
Learner Motivation and Attendance	14
Why Enrol in an ALP?	19
Why Stay in an ALP?	21
Why Leave an ALP?	22
Measurement	25
Mathematical Limitations	28
ALP Math Curriculum	28
Importance	28
MLD	29
Instructional Strategies	31
Closing Comments	32
3. METHODOLOGY	36
Research Questions.....	36
Participants.....	37
Measurements.....	38
Procedure	39
4. RESULTS & DATA ANALYSIS	43
Research Questions	43
Quantitative Results	45
Inconsistent Attendance	50
Mathematical Limitations	53
5. CONCLUSIONS & RECOMMENDATIONS.....	56
Conclusions	56
Discussion	59
Recommendations	61
Instructional Strategies	61
Next Steps	66

BEHIND THE BARRIERS

REFERENCES 68

Appendix A. Survey Study 78

 Demographic Form 78

 Math Survey Questionnaire 79

 Attendance Survey Questionnaire 80

Appendix B. Conceptual Framework 81

Appendix C. Participant Consent Letter 82

Appendix D. Consent to obtain information 85

LIST OF TABLES

Tables	Page
1. Adults' Attitudes toward Continuing Education Scale (AACES) influence	27
2. The issue of attendance	46

LIST OF FIGURES

Figures	Page
1. The all-encompassing learner	15
2. Keeping students connected	20
3. Age and gender demographics	48
4. Cultural Background	48
5. Unemployment and Income Assistance	49
6. Yearly Income	50
7. Factors of Inconsistent Attendance	51
8. Inconsistent Attendance: Levels of Agreeance	52
9. Factors of Mathematical Limitations	53
10. Mathematical Limitations: Levels of Agreeance	55

Chapter 1

INTRODUCTION

Too often we hear about students who have ‘fallen through the cracks’. Some Canadians graduate from school on an Individualized Program Plan (IPP); others opt out before receiving their diploma. There is a safety net that gives these learners a second chance - the Adult Learning Program (ALP). Each learner comes with varying academic achievements, barriers, prior learning, and personal history. With my ten years of experience as an adult educator in Halifax, Nova Scotia, there are two barriers in particular, that stand out, which have made more difficult for a substantial number of learners attending Level II or III of an ALP in Halifax, to succeed. The acknowledgement of these as potential obstacles to an adult learner’s success is supported by the academic literature. The two very different but oft-encountered barriers that some adult learners can find challenging to overcome are: maintaining regular attendance (Lam & Wong, 1974; Beder & Valentine, 1990; Oluoch, 2005; Comings, 2009; Mellard, Krieschok, Fall, & Woods, 2012; Lesgold & Welch-Ross, 2012; Greenberg, Wise, Frijters, Morris, Frederick, Rodrigo, & Hall, 2012; and Pickard, 2013) and the limitations that individuals can experience with mathematics (McLeod, 1992; Zawaiza & Gerber, 1993; Allen, Smith, Jerge, & Vires-Collins, 1997; Patton, Cronin, & Bassett, 1998; Hoyer, Cerella, & Onyper, 2003; Simmons & Singleton, 2006; Kaufmann, Pixner, & Göbel, 2011; Metcalfe & Campbell, 2011; Hock, 2012; Buelow & Frakey, 2013; Jameson & Fusco, 2014). If the nature of these barriers is determined, then supports can be put in place to alleviate their impact.

The population of interest for this study is the adult learners enrolled in either Level II or III of an ALP offered in Halifax, Nova Scotia. It is the researcher’s opinion that should the study be redone with the population of interest representing all of Nova Scotia’s ALP learners, results

would be similar. A recent provincial report states that 67% of adult learners in Nova Scotia want to improve their capabilities in mathematical achievement. Results from the same report reveal that if a General Education Development (GED) test-taker fails a test, most often it is in mathematics (Nova Scotia School of Adult Learning [NSSAL], 2014). My research is relevant in part because it aims to examine the potential contributing factors behind the barriers that hinder many adult learners enrolled in an ALP in Halifax from mathematical achievement. Identifying the issues that impact a learner's difficulty with mathematics can inform and assist instructors who wish to incorporate informed instructional strategies in the classroom or using an alternative medium of instruction. Learners who do not feel comfortable with their knowledge and understanding of the essential skills in mathematics will benefit from a program designed with these issues in mind.

The Nova Scotia government is dedicated to the notion that learning can take place anywhere; and that lifelong learning has inherent significance with regards to the personal and social development of all citizens of Nova Scotia. This is demonstrated through the initial recognition that the role of the learner should be prominent and able to display a preference for adaptable methods of instruction (Nova Scotia Department of Labour and Workforce Development, 2010). It is a concern that nearly half of adult learners in Nova Scotia have self-identified as being diagnosed with some kind of mental health concern (NSSAL 2014). This could be a visual or hearing impairment. Other possibilities could include: being diagnosed with anxiety, depression, bipolar, attention deficit, or with a physical or learning disability. Even if not specifically identified as mental math issues, mental health could impede the cognitive function needed to perform mental math calculations. Furthermore, adults are often unable to

regularly attend an upgrading program due to outside obligations. Therefore, it is our duty as adult instructors to support any form of education that can help overcome these limitations.

Ultimately, the significance of the research is two-fold. It lies in the potential benefits it can offer the adult learners who feel perturbed with their lack of understanding of mathematical concepts.

Purpose of the study

The purpose of this academic inquiry is to identify the influential variables that may contribute to the previously mentioned barriers, namely attendance rate and/or mathematical limitations. The research provides useful information about the variety of factors that generate the difficulties with maintaining consistent attendance and acquiring a working proficiency in mathematics - barriers that adult learners in Level II and/or III of an ALP in Halifax can be and have been faced with.

Using a quantitative research approach, the data from a descriptive record review and survey study is analyzed to better understand rationale for missing school and the reasons behind the struggle with math achievement. Patton et al. (1998) state that “many students’ difficulties in mathematics stem from attendance issues or lack of motivation” (p. 239). Individuals who have taken the time to participate contribute important data needed to optimize the strategies used in the future for our community of adult learners in Nova Scotia.

Although surveys have been conducted in the past for both attendance (Boshier & Collins, 1985; Darkenwald & Hayes, 1986; Massingham & Herrington, 2006; Erbstein, 2014) and mathematical limitations (Richardson & Suinn, 1972; Fennema & Sherman, 1976; Hopko,

Mahadevan, Bare, & Hunt, 2003; Tapia & Marsh, 2004; May, 2009), there is still much that can be gained from the survey study used in this research. If not to inform the instructional strategies to use, then to promote an alternative medium for program delivery.

Statement of the problem

Over the last decade, as an academic instructor for adults, it has been hard to ignore two very different but commonplace barriers: i) inconsistent attendance and ii) the ongoing struggle to reach a working proficiency in math. Therefore, the questions that my research aims to answer are as follows:

- 1) To what extent do adult learners enrolled in an urban academic upgrading program have difficulty maintaining regular attendance and/or attaining mathematical achievement?

In particular:

- i) What are the barriers to adult learners' ability to maintain regular attendance?
- ii) What are the barriers to adult learners' ability to attain mathematical achievement?

The fact that 55% of Canadians failed to meet the level of numeracy skills needed to satisfy today's socioeconomic demands highlights the importance of the ALP (Statistics Canada, 2003). In Nova Scotia, the struggle for mathematical achievement is reinforced by a recent provincial report stating that two-thirds of adult learners want to improve their math efficiency (NSSAL 2014). This data reflects how numeracy is an invaluable essential skill for contributing members of society. Nevertheless, despite the overall benefit of adult upgrading programs, they have a history of high attrition rates (Lam & Wong, 1974; Greenberg et al., 2012).

Methodology

To measure the research outcomes, participants fill out two online questionnaires each using a 7-point Likert scale to indicate to what level each of the statements is applicable. Statements on each questionnaire highlight the issues that might influence attendance rate of an adult learner enrolled in Level II and/or III of an ALP in Halifax, N.S., and the factors that contribute to their ongoing struggle with mathematical achievement. A comparison of the survey results with the responses on the demographic form show the co-relations between the barriers and the learners who experience them. Findings from the research are analyzed to better understand Haligonian adult learner's reasons for missing Level II and/or III classes of their ALP and the details behind their struggle with mathematics.

Analysis of the data can potentially address why these barriers exist. With regards to attendance, is the nature of inconsistent attendance a result of motivation, transportation, employment, or prior engagements? Is self-acknowledged truancy more likely amongst learners with children or with mental or physical health issues? The data from the survey can also determine if this barrier is affected by cultural differences or socioeconomic status. With respect to the difficulties with mathematics, the questionnaire can help identify if the variables with potentially the most influence are connected to a learner's mathematics anxiety, level of cognitive function, self-concept, or the method of instruction.

Limitations

There are limitations within this research study. The researcher has developed an untested questionnaire based on the potential barriers observed while instructing Level II & III mathematics to adult learners in an ALP in Halifax, Nova Scotia. The sample size of the online survey study is

limited to learners who were in attendance between 2011 and 2015 of either Level II or Level III of the four level Adult Learning Program offered in an urban Community Learning Organization (CLO) in Nova Scotia. A 20% response rate indicates to the researcher that more time to complete the online survey or additional reminders may have improved the number of participants willing to complete the survey study. Further limitations include the fact that the email address on file for each student need be still active so that they could be invited to participate in the survey.

Anticipated risks might include accuracy of reports, as some participants' answers may be retrospective – up to five years. There may be apprehension to respond if a participant is not computer literate, and students have the potential to react emotionally when asked to self-identify or reflect about the way they perceive their academic attendance and math performance. The possible effect that these considerations may have on the quality of the data is that the opinions generated have the luxury of hindsight. The participant's true thoughts on the matter will be asked for and expected, but it is understood that we cannot always recall our feelings with accuracy. However, it is my opinion that the knowledge gained from this research, and the potential positive impact on program delivery, outweigh the anticipated apprehensions, despite potential concerns. Similarly, Mellard et al. (2013) found that although conclusions based on cause-and-effect cannot be drawn from retrospective studies, there are worthwhile benefits that are worthy of such studies.

Definition of Terms

Adult learners are individuals, 18 years or older, who participate in adult upgrading programs.

Attrition is the act of dropping out of upgrading programs.

Consistent attendance is maintaining the required rate of attendance of 70% or more.

Excellent attendance is maintaining a rate of attendance of 90% or more.

Inconsistent attendance is attending less than the required rate of attendance of 70%.

Poor attendance is attending less than 50% attendance and at a high risk of being withdrawn.

Acronyms:

ALP: Adult Learning Program

CLO: Community Learning Organization

GED: General Education Development

IPP: Individualized Program Plan

MLD: Math Learning Difficulty

NSSC: Nova Scotia Community College

NSSAL: Nova Scotia School of Adult Learning

Organization of the remainder of the Thesis

The organization of this thesis follows a typical five-chapter format. Chapter 1 provides a background to the research including: purpose of study, statement of problem, methodology, limitations, definition of terms, and organization of thesis. Chapter 2 incorporates a review of the relevant literature on the subject of attendance issues within adult learning programs and regarding the mathematical limitations encountered in adult learning programs. Chapter 3 examines the methodology of the thesis, including the details and approach used to conduct the record review and online survey study. Chapter 4 consists of an analysis of the quantitative descriptive data. Chapter 5 concentrates on the conclusions reached from the results obtained from the survey, as they pertain to the research questions. This is followed by proposed recommendations and suggested future steps needed to further assist the adult learner in Nova Scotia on their learning path toward mathematical accreditation. Appendices will follow Chapter 5 after a complete list of relevant references used in this study.

Chapter 2

LITERATURE REVIEW

The following review of related literature will examine the two most commonplace barriers faced by adult learners enrolled in either Level II or III of an ALP in Halifax, Nova Scotia. In my opinion, they are: inconsistent attendance and mathematical limitations. The research will examine the current literature on the potential influences of each of these significant barriers.

With regard to attendance, a key factor to consider is motivation. A learner's motivation can be related to why an adult learner would enrol in an upgrading program, it can influence why they stay in a program once enrolled, and it can have an impact on how well they persist or why they choose to leave (Houle, 1961; Boshier & Collins, 1985; Beder & Valentine, 1990; Comings, 2009; Lesgold & Welch-Ross, 2012; Mellard et al., 2013). Further attention will be devoted to the existing methods used to measure an adult learner's motivation and the strategies that can be put in place to improve the likelihood of consistent attendance.

When considering the factors behind the barrier of struggling with mathematical achievement, we will review the myriad of learning difficulties associated with mathematical literacy, the stigma that society has attached to the subject of mathematics, and effective instructional strategies that can foster the acquisition of mathematical abilities.

BARRIER ONE: INCONSISTENT ATTENDANCE

As an adult educator, one prime objective is to work with students so that they build a strong foundation of acquired skills. If a learner does not maintain consistent attendance, this becomes a challenge. Greenberg et al. (2013) agree that one barrier that considerably impacts the

progress made by learners in adult literacy programs is the inconsistent attendance seen in adult upgrading programs. Ongoing attendance can be displayed by an adult learner who persists despite the distractions and responsibilities faced by their day-to-day activities. Zhang, Katsiyannis, Barrett, & Willson (2007) suggest that learners who maintain consistent attendance are more apt to: develop self-confidence, view their education as a positive experience, and play a more productive role in society. Whereas, Hocking (2008) warns that the negative effects that inconsistent attendance can have on a learner not only include falling behind in their studies, but the potential of unlawful activities.

As long as there have been upgrading programs to attend, there have been learners who have not attended. Terry (2001) explains that “the challenges that face today’s adult educators in Canada are part of a historical continuum” (p. 62). In fact, at the start of the 20th Century, adult educators noticed a need to bring the power of knowledge and critical thinking to the people – wherever they may be. Enter distance education, delivered synchronously (when students are gathered together and are learning at the same time) or asynchronously (when students are not assembled together at the same time). Alfred Fitzpatrick, from Pictou, Nova Scotia, established Frontier College in 1899, the oldest institution of adult education in Canada still operating today, as a substitute to higher education (MacKeracher, 2009).

Another historic example of synchronous distance education is echoed through the hard work of Jimmy Tompkins and Moses Coady (1939), cousins who held the belief that all adults had the right to socioeconomic development and empowerment. Motivated by these factors and in the face of economic adversity, Tompkins and Coady initiated the Antigonish movement. Coady would inspire and empower others at mass meetings held within the maritime community. He used the notion that an individual’s income level fuels their desire to better themselves and

that we each have the mental capacity to sustain our drive to achieve these goals. Based on the needs addressed during the mass meetings, study clubs would be organized. These study clubs would give rise to a program of meetings for economic planning and social development. As a result, many cooperatives and credit unions formed in the Maritimes have the Antigonish movement to thank. Coady (1939) foresaw that the cooperative approach was accessible and “such that all the people, including the poor and those of low-grade intelligence, may make their contributions in the reconstruction of society” (p.134-135). This notion of using academic upgrading as a means of enabling adults from all walks of life to contribute to their community as upstanding citizens serves as one of the foundational building blocks upon which this research study is built.

While founding Canada’s original literacy organization, Fitzpatrick (1920), recognized that, by and far, adults want to improve their skills but may be faced with barriers. To reach those who chose to enter into the labour force rather than continuing their schooling, potentially due to their struggle with traditional brick-and-mortar education, he identified that:

There exists in every community a considerable class of persons who because of occupation, age, preparation, or other reasons, are unable to adjust themselves to a formal system of education. These persons, having capacity and ambition, have a claim upon the province for educational opportunities outside of the formal regime. (p. 106)

To make academia accessible to everyone, Fitzpatrick thought that the learning environment should be brought to the learner and not necessarily expect that the learner will make their way to an academic institution. Always the educator, he would send trained practitioners into the workplace - whether they were lumber camps, farming communities, factories, penitentiaries, or rural settlements of the frontier. Once there, the practitioner would erect a reading tent in which

to teach their fellow labourers. Although Walter (2003) may have viewed Fitzpatrick as a means to assimilate Canadian newcomers, he also notes that included in the curriculum were lessons on counting money; dealing with the bank; and measurement of time, space, weight, and volume.

An antiquated example of asynchronous distance education might be of upgrading materials sent to the learner by post and returned in kind when completed. Several students could get the same learning modules and potentially complete them at different moments in time. This education via correspondence was the answer needed for those seeking to upgrade their skills but lived a substantial distance from an academic institution.

Fast forward to the future and little has changed with regards to attendance, or lack thereof; it is still a pressing issue amongst adult learning programs. Researchers (Lam and Wong, 1974; Schalge & Soga, 2008; Pickard, 2013) agree that further scrutiny of this particular barrier could potentially result in substantial implications with regard to the delivery of adult upgrading programs; and that there is a rising demand for practical strategies as a solution to the problem of inconsistent attendance. Arguably, one of the greatest difficulties faced for anyone involved with the instructional design of an adult learning program would be the encouragement and reinforcement of maintaining consistent attendance (Lesgold & Welch-Ross, 2012; Greenberg et al., 2013). This could explain why participation remains one of the foremost topics of discussion in the world of adult education and lifelong learning (Blunt & Yang, 2002).

Although further examination of the issue of inconsistent attendance has already been explored, researchers (Bean & Metzner, 1985; Furst & Steele, 1986; Tinto, 1993; Bowen, Price, Lloyd, & Thomas, 2005; Fisher & Engemann, 2009; and Carr, 2014) have primarily focused their studies on students at the college or university level, which is often regarded as the standard

when considering the term, adult learner. For the purpose of this study, we define *adult learners* to be considered as persons who have not yet attained a high school diploma through authorized schooling, as well as those who have graduated through an IPP, and are enrolled in an upgrading program with the intent of improving their academic skills. This definition is reminiscent of that of the non-traditional student, put forward by Bean and Metzner (1985), where the learner is over 18 years of age, from varying social and economic backgrounds, and enrolled in an upgrading program.

Being an adult comes with experience. Their lives have been established and, no doubt, involve others. Each individual comes from a unique background and has prior learning experiences to draw from. Currently, in Nova Scotia, twelve credits are required to earn your Adult High School Diploma. According to the Nova Scotia Community College (NSCC), adults seeking to obtain recognized credits toward their diploma must first achieve 90-110 classroom hours to receive one full credit (NSSAL, 2010). Prior to reaching Level IV, the final stage in Nova Scotia's Adult Learning Program, learners typically receive about 800 class hours per level or calendar year. The National Council of Research (2012) also recognizes that adults with low literacy require hundreds of hours of educational instruction and practical exercises. Saah & Mensah (2013) have identified that ALPs nurture, engage, and prepare lifelong learners to become responsible citizens at work and in the community. This feat requires countless hours of active engagement and is achieved with consistent attendance in an academic upgrading program.

The adult learner is a special breed of learner. In Canada, education falls under provincial authority. Nova Scotians have the right to attend public school until they are 21 years old. In Nova Scotia, children between the ages of 5 years and 16 years old are legally required to attend

school, public or home educated – this can foster an attitude of going to school because one ‘has’ to go. On the other hand, an adult learner attends an upgrading program because they want to. This simple distinction highlights a key difference between adult learners and public school students. Comings (2009) articulates it best: “Adults must make an active decision to participate in each class and often must overcome significant barriers in order to participate in educational services. Therefore, student persistence is an issue that all adult education programs must address” (p.160). It is the students who maintain consistent attendance that are most apt to succeed (Pascopella, 2007). It is the opinion of this researcher that adult learners enrolled in Level II and/or III of an upgrading program in Halifax, Nova Scotia have noticed that taking ownership of their acquired skills plays an important role in improving their quality of life. Furthermore, an ALP can make up for not getting everything they wanted or could have received from their previous education. Even those not enrolled in an upgrading program recognize education as a necessary stepping stone to more professional and financially stable employment (Oluoch, 2005).

Considering the understanding that we now have on the emphasis that active participation plays on the progress of the lifelong learner, according to the National Research Council based in Washington (2012), adult learners who play an active role in their academic upgrading are not only likely to be more committed and engaged, but to also maintain consistent attendance in their upgrading program - more so than adults mandated to enrol. A learner's motivation can be influenced by their initial experience during the intake assessment including how the feedback was received (Lesgold & Welch-Ross, 2012). Additionally, the manner in which a learner is perceived by their peers plays a significant part in their motivation to continue with their studies. Therefore, they may opt for avoidance rather than seem inept (Middleton & Midgley, 1997).

LEARNER MOTIVATION AND ATTENDANCE

The literature suggests that motivation is an essential, if not the key factor affecting adult learners' decision to attend an upgrading program (Houle, 1961; Boshier & Collins, 1985; Beder & Valentine, 1990; Comings, 2009; Pickard, 2013; Mellard et al., 2013; Saah & Mensah, 2013). Although motivation certainly plays an important role in the daily decisions of various adult learners, we cannot presume that it is the only reason that they succeed. The strength of an adult learning program is directly linked to what the learner perceives to gain and how they are motivated to participate (Saah & Mensah, 2013).

Historically, motivation has been a well-documented reason for adults to attend an academic upgrading program. Houle (1961) conducted a study using 22 adult education participants in the Chicago region. Through his research, he determined that one of three factors motivates these adult learner. The three categories of learners are:

- Goal-oriented
- Activity-oriented
- Learning-oriented learner

Houle's typology was intended to simplify the rather complex topic of motivation among adult learners. Gordon (1993) expanded on Houle's motivational orientation model by suggesting a universal approach to learning, as seen in Figure 1, where learning is an intrinsic part of who they are.

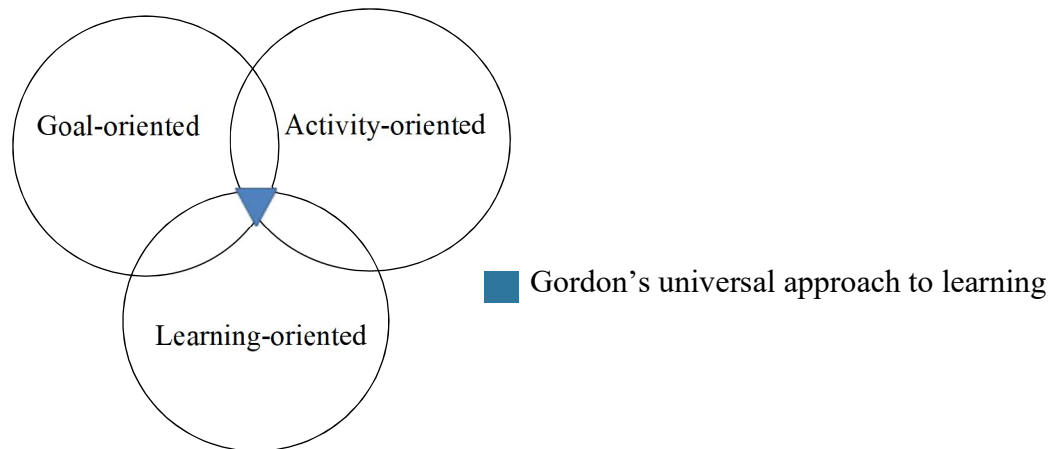


Figure 1. The all-encompassing learner. This figure displays Gordon's view of learning as a defining trait.

The impressive scope of psychological research on what motivates someone has been held in such regard that the American National Research Council (2012) identifies: interest, self-efficacy, self-control, self-regulation, self-concept of one's capacity, setting goals and selecting tasks as contributing motivators. Beder (1991) states that "when motivation is strong, adults can be expected to overcome the barriers to participation that life imposes" (p. 39).

Lam & Wong (1974) surmised that the five attendance motivators, leading with the most essential, are:

- The instructor's approachability and the extent of casual interactions
- How well the curriculum suits the needs of the learner
- The extent of academic interaction
- The level in which the material is understood
- The camaraderie amongst classmates

This indicates that a key underlying influence on the staying power of a learner is in the social interactions with their peers and their instructor(s). Saah & Mensah (2013) reported that 61% of the participants in their study were influenced to maintain consistent attendance by the knowledge of the success of previous program participants.

Although the validity of Houle's typology is evident decades later, as his classification of learners can still be recognized in others' attempts to categorize motivational factors, it is also clear that there is more to consider. In Furst & Steele's (1986) study, the *motivators* of importance were:

- Fulfillment
- Intellectual stimulation & enjoyment
- Practical achievement
- Stimulation & self-maintenance

Despite the fact that a social component is apparent in the enjoyment and stimulation motivators listed, there is still evidence of Houle's influence. This is attributed to the learning-oriented and goal-oriented categories being well-represented.

In 1990, Beder & Valentine suggested that adult learners attend the upgrading program of their choice because of the following motivators:

- Economic need
- Literacy development
- Diversion
- Educational advancement
- Launching
- Job advancement
- Urging of others
- Family responsibilities
- Self-improvement
- Community involvement

In this list, we notice that other motivational factors have been taken under consideration.

Whereas the objective of academic or vocational advancement can certainly be considered

reasonable for the goal-oriented learners, we see how economic need is the subtext of these goals. Additionally, the outside influence of others can be seen in family responsibilities and the urging of others. Literacy development and self-improvement speak to the learning-oriented learner.

Houle (1979) suggests that motivation is the subject most examined and contemplated by adult educators. Beder (1991) also supports the notion that motivation is key to helping many adult learners transcend the barriers of inconsistent attendance and actively participating in their upgrading program. It has been postulated that one's perception of their effort is not always directly linked to the extent of their effort (Steinberg, Brown, & Dornbush, 1996). A potential explanation for the tenuous amount of experimental research when assessing what motivates individual adult learners may be due to the few measures that assess motivation and its relevant factors, like fascination and enthusiasm (Lesgold & Welch-Ross, 2012).

Comings (2009) noted that "the literature reviews see persistence as supported by motivation and constrained by barriers" (p.173). Whether adult learning programs alter their instructional design, the way in which their intake process is conducted, or simply involving the learners to best reflect the current motivational factors of their participants, it is evident that a change is needed to improve the persistence of lifelong learners (Beder, 1991; Comings, 2009).

The research clearly indicates the value of a learner's motivation to first enrolment and then persistence in an upgrading program. Whereas some learners may have a clear reason for upgrading that can fall under one of the many pre-existing categories, others may have multiple reasons of varying importance that contribute to their decision to consistently attend an ALP. Let

us take a closer look at the contributing factors that may lead an adult learner to enrol in a community learning organization.

WHY ENROL IN AN ALP?

"Recent research has confirmed the importance of attitude to be an essential aspect of the decision to participate" (Blunt & Yang, 2002, p. 302). If an adult learner's previous academic experience was negative, this could potentially leave the learner with a lasting impression that could hinder any desire to pursue any further academic upgrading (Quigley, 1992). Wigfield & Eccles (1992) propose that students must view their academic upgrading as meaningful, stimulating, practical, and a worthwhile use of their time for them to actively participate or even enrol in such a program.

Based on in-depth interviews, held over 2 years with 30 participants from upgrading programs offered through 10 libraries within California, New York, and North Carolina, Comings (2009) identifies 5 typical paths behind these adult learner's decision to enrol in an upgrading program. These reasons are:

- Permanent (education is the goal)
- Obligatory (attendance is the goal)
- Momentary (to achieve a certain objective)
- Exploratory (unclear goals and other barriers may lead to disengagement)
- Irregular (participation is whenever/wherever until goals are reached)

It seems apparent that personal issues and environmental elements can contribute to the intermittent learners' inconsistent attendance.

It is important to note that the different events that occur in someone's life may have a powerful impact on their academic upgrading. Improved literacy can be a direct result of starting a new job or the arrival of newborn as a result of the positive effect that occurs from reading new materials or reading more often. Refined numeracy skills can be connected to a change in household income due to the addition of a significant other (Reder, 2010). The correlation between maintaining consistent attendance and academic mastery, as well as the negative effect that inconsistent attendance can have is established in Figure 2. The following image also highlights the relationship between the barriers of inconsistent attendance and mathematical limitations. A student who chooses to attend regularly is more likely to master new mathematical concepts over the student who misses content by not attending classes. This graphic representation is influenced by Schofield's (2011) presentation at the Atlantic Conference on Learning Disabilities and has been created by this researcher to reflect the potentially beneficial and unfavorable cycles of an adult learner enrolled in an ALP.

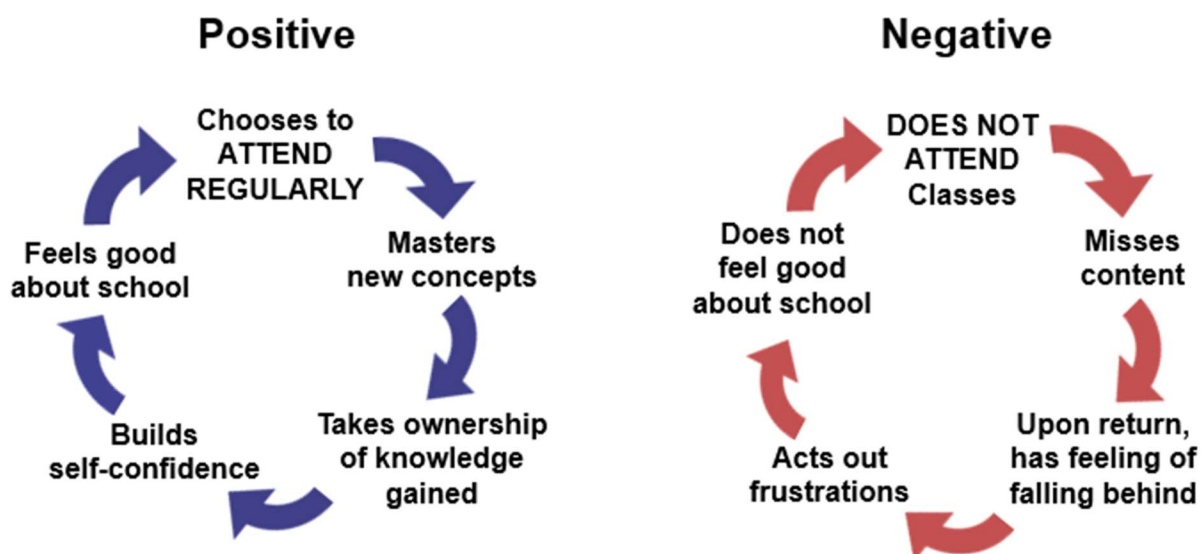


Figure 2. Keeping students connected. This figure illustrates how attendance impacts academic progress.

No doubt, there are a number of motivational factors that play a key role in influencing a number of adult learners. However, once enrolled, what keeps a learner in attendance, and what makes them persist or become actively engaged participants?

WHY STAY IN AN ALP?

Saah & Mensah's (2013) statement that an urbanite female adult learner's perception of their literacy programme will elevate their overall learning experience is accurate. This is true from both the perspective of the learner and the instructor. There is no algorithm that is followed to maintain consistent attendance in an adult upgrading program. The wide variety of contributing factors can change depending on the academic institution, its geographical location, the students' ages and social and/or economic status (Phillips, 2010).

Participants taking part in a two-phase study through the National Center for the Study of Adult Learning and Literacy (NCSALL) described 4 forces that affected them positively (relationships, goals, teacher & students, and self-determination) and 3 forces that affected them negatively (life demands, relationships, and self-determination), according to Comings (2009, p.166-167). Another interesting observation is the *similarities* between the forces that hinder and encourage a lifelong learner.

The American National Research Council (2012) reports that a particular adult learner's likelihood to progress further in their upgrading program can be linked to:

- Previous engagement with adult upgrading programs
- The selection of an attainable goal
- A supportive network of family and friends

On the other hand, a learner's progress is often threatened by:

- Everyday responsibilities
- A lack of support within social circles
- An absence of ambition

Much of the above-mentioned factors are out of the control of the institution. However, assisting a learner in setting realistic goals can be done with academic counselling. This life skill can prove invaluable when applying continuous learning to other areas in one's life.

We have discussed why adults enrol in an ALP and have further examined reasons for attending and persisting in an upgrading program. Finally, we will take a look at the influential factors that cause a learner to leave an adult learning program, either temporarily or to dropout completely.

WHY LEAVE AN ALP?

Porter et al. (2005) determined that learners' root reason(s) for leaving an upgrading program can be either personal or environmental. Specific examples could be issues with living accommodations, insufficient childcare, inadequate transportation, and/or a lower sense of performance capabilities. Pickard (2013) states that the majority of learners associate their departure from an upgrading program to uncontrollable circumstances, such as employment, issues with health, and economic burden. Whatever the reason(s), "some students will always be coming and going" (Belzer, 1998, p. 5).

It is refreshing to see that the way in which persistence is viewed is evolving to better reflect the interests of the lifelong learner. It has been made clear that there will likely always be

a group of people for which formal education is not the best answer. Rather than measuring their progress or persistence in a purely formulaic way, acknowledging that learners may attend one or more different upgrading programs intermittently suggests a method of measuring an adult learner's commitment to their continued education in a manner that is more reflective of their needs. Some may not be able to maintain consistent attendance due to their socioeconomic status, cultural inequalities, and/or fears. It is time to revisit how we hold adult learners accountable for their upgrading. The implementation of an approach regarding the measurement of an adult learner's persistence will, no doubt, better suit the needs of the learner and will foster a learning environment of mutual respect. Comings, Parallela, & Soricone (1999) put forward the following, more suitable, definition of persistence:

Adults staying in programs for as long as they can, engaging in self-directed study or distance education when they must stop attending program services, and returning to program services as soon as the demands of their lives allow. (p.13)

Mellard et al. (2013) point out that although there have been numerous attempts to study the primary influences that cause a learner to persist in an academic upgrading program, the issue remains pertinent to adult educators. Much as it is tempting to want to associate a lack of persistence with issues that can be controlled, such as: academic programming, instructional methods, or institutional policies and procedures; the reality of the situation may require the consideration of societal influences or those that may be learner-driven.

To prevent learners from dropping out of adult upgrading programs, Quigley (1997) suggests that these programs use an approach different than the traditional educational system to avoid repeating negative experiences a learner may have had when they attended school. In his

opinion, the main contributing factors to the barrier of inconsistent attendance are: situational, institutional, and dispositional.

Raymond (2008) indicates that if learners feel that they are not well-received by their classmates, their perspective of their education can shift to one of contempt. Comparably, it would stand to reason that students who report not having a positive relationship with their instructor(s) could likely choose to be absent from class.

In 2010, although Phillips conducted a staff survey within a rural American high school in Georgia to determine what the underlying reasons were for students missing classes, the opinions of the staff are worth noting as adolescents and young adult learners can share common traits. The faculty and administrative staff answered that, in their opinion, a student's disciplinary record, their extracurricular activities, and their achievements were the most important academic factors related to the lack of consistent attendance and stated that substance abuse was the most notable environmental factor. Despite the number of adults who choose to enrol in an academic upgrading program, Lesgold and Welch-Ross (2012) postulate that the issues that influence a learner to not persist may be affected by varying non-academic responsibilities, past negative learning experiences, or classroom instruction that is either not engaging or not effective.

Additionally, Greenberg et al. (2013) present the possibility that there are some learners who avoid reading higher level texts and may require further support to maintain consistent attendance. Taking this into consideration, what may be seen as a bad decision may actually be a conscious reaction to the burdens and responsibilities of academia. Learners with low self-perception may resist a traditional instructional setting which, in turn, can further fuel their lack of self-esteem. How social and educational structures shape a learner's determination and

persistence shines a light on why some adults learners may have left the traditional academic environment and how their motivation to continue with their upgrading may have been, and may continue to be, put in jeopardy. If a learner thinks that the potential to reach their objective is no longer possible, it is plausible that they choose to be absent rather than persist within an ALP (Lesgold and Welch-Ross, 2012).

Though there is much to benefit from discussing the reasons that an adult chooses a) to upgrade their skills; b) enrol in an ALP; c) maintain consistent attendance; and d) actively engage in their learning process, it is also essential to review the existing methods of measurement of the attitudes and motivational factors that can influence an adult learner's participation and persistence in their upgrading program.

MEASUREMENT

Motivational research has its beginnings with Houle's (1961) typology of the factors that influence adult learners to participate in adult education programs in Chicago. It gained momentum with Boshier's (1971) inception of the Education Participation Scale (EPS) and those inspired to refine it further (Furst & Steele, 1986; Lethbridge, 1989). In 1986, Darkenwald & Hayes introduced the Adult Attitudes toward Continuing Education Scale (AACES). These examples provide evidence to contrast Blunt & Yang's (2002) claim that "few standardized sociopsychological instruments are currently available to researchers" (p. 299). Nevertheless, the National Research Council (2012) also attests that there are limited measures to assess how motivated, engaged, and interested learners are.

As previously mentioned, in 1961, Cyril O. Houle trisected the motivational influences of the adult learner in Chicago. His limited research of 22 participants revealed that their learning

orientations included: learners who demonstrated a desire to upgrade their skills to achieve a particular goal, participants who attend classes at community learning organizations with a more social motive, and those who sought out continuing education due to their dedication to learning.

Boshier & Collins (1985), designed a study to determine whether Houle's typology coincides with data gained from an abundance of participants in a variety of settings. They confirmed Houle's tri-cluster of motivational factors. However, they also note that for the socially driven, activity-oriented learner there are further sub-sections to consider. They encompass: the relationships gained through **social contact**; the **social stimulation** found from escaping the countless responsibilities of life; expectations from outside sources with respect to **social status**; and the community service provided in becoming an effective citizen in the name of **social welfare**.

Blunt & Yang (2002) praise Boshier for regularly reporting data to support the EPS's credibility and recognize that endeavors to improve such measurements are scarce when researching adult education. With regards to the EPS, the accepted standard (Boshier & Collins, 1983; Furst & Steele, 1986) is to use the following six contributing aspects to assess the conceivable motivational factors of an adult learners:

- Professional Advancement
- Social Contact
- Social Stimulation
- External Expectations
- Community Service
- Cognitive Interest

There has been much advancement with the measurement of participation in educational programming, and the recommendation of using the EPS scale is justified. For the purpose of this study, this researcher agrees with Furst & Steele (1986) who emphasize that we should not close the door on future studies. Darkenwald & Hayes (1986) also recognized the need to strive for a more detailed description of the reasons that adults choose to continue their education in an upgrading program. They, therefore, developed an 88-item scale to measure the attitudes that adult learners can have toward continuing education. With the assistance of doctoral students and adult education faculty, this scale was reduced to 30 items for the pilot. The final version of the Adults' Attitudes toward Continuing Education Scale (AACES) has 22 items that acknowledge the adult learner's attitude toward their education and academic surroundings. As illustrated in Table 1, 7 elements of the 22 items can be seen in the statements selected for the attendance component of the online survey study used in this research.

Adults' Attitudes toward Continuing Education Scale	Inconsistent Attendance Survey
3 – I enjoy participating in educational activities	My past experiences with school are not good
5 – Continuing education is mostly for people with little else to do	I often have family commitments
9 – I dislike studying	I don't feel motivated to attend classes
15 – I'm fed up with teachers and classes	I don't like my instructor(s)
17 – I enjoy educational activities that allow me to learn with others	Social interaction at school make me feel awkward
19 – For me, continuing education is less important than my leisure activities	I have appointments scheduled during school hours
22 – I can learn everything I need to know on my own without participating in continuing education	I'm not getting what I want out of my school program

Table 1. AACES influence. This table provides reference of the influence that the AACES has had on the online survey study.

BARRIER TWO: MATHEMATICAL LIMITATIONS

ALP MATH CURRICULUM

Funded by the Nova Scotia Department of Labour and Advanced Education (LAE) and a member of NSSAL, CLOs that offer an ALP are key partners in the delivery of adult literacy and workplace essential skills, including numeracy. The Nova Scotia ALP consists of four levels of study and is free for adult learners interested in obtaining high school credentials. The mathematics curriculum delivered in Levels II & III focuses on the development of number sense, proportional reasoning, measurement, automaticity and flexible thinking, solving problems involving shapes and angles, pattern recognition, data analysis, interpretation of probability, money management, and an introduction to algebra. Participants from these two levels of study will constitute the population from which the research volunteers are invited.

IMPORTANCE

A level of competency in math is essential in adulthood. Patton et al. (1998) maintain that “math is a significant part of all of our lives and is woven into all of the areas identified (employment, further education, home and family, leisure, health, community involvement, interpersonal relationships, and personal development) affecting successful functioning on the job, in school, at home, and in the community” (p.242). The demand for a solid foundation of basic math skills is driven by the importance that numeracy plays in the home, community, and workplace. Our efficiency with numbers is crucial to the way we see the world. We use numbers to count both tangible and intangible things, to collect data, to negotiate goods & services, to tell time. We use them to denote civic addresses, academic merit, to compare athletes, and for measuring one’s health. Messenger, Emerson, & Bird (2007) caution that “there are links between poor numeracy skills and disadvantage in adult life” (p. 37).

The acquired math skills that pertain to the everyday life of an adult can be summarized as the conceptual understanding of numbers, numerical relationships and operations, as well as measurement and spatial awareness. Additionally, recognition of patterns and the ability to make comparisons are also pivotal to the development of active and meaningful learning that has real world applications rather than simply learning by rote methods. These much needed numeracy skills are rooted in the developmental process that takes a learner from a concrete thinker to an abstract thinker.

MATH LEARNING DIFFICULTY

Nevertheless, struggles with mathematics are not uncommon. Impediment can come in multiple forms: cognitive, affective, and social. Mazzocco (2005) submits that “there is much variability in how mathematic difficulties are defined and measured, and even in the terms used to refer to them” (p. 318). There is a variety of terminology used to identify how mathematical understanding can be altered by psychological factors. Math Learning Disability (MLD), Math Disability or Difficulty (MD), Arithmetic Disability (AD), Word Problem Difficulty (WPD), or Dyscalculia (meaning difficulty calculating often due to cerebral dysfunction) are only a handful of expressions characteristic of a discomfort with mathematics. Although not yet standardized, the term MLD will be used in this thesis to describe the attributes of a learner with a Math Learning Difficulty. This puts a more positive spin on the way in which the student learns. Rather than label their limitations with a negative outlook of not being ‘able’ to do something, they are encouraged through the notion that they have the potential to learn, perhaps simply in a different manner than others. A closer look at the three MLD subtypes, based on cognitive function, reveals that it could be procedural, linguistic, or visual-spatial (Geary, 2003). That is development can impact the use of counting procedures and solving math problems (procedural);

or the deficit could be with retrieving basic arithmetic facts (linguistic); or challenges that may occur with word problems and aspects of geometry (visual-spatial).

Hock's (2012) research reminds us that less than 10% of the literature on learning disabilities pertains specifically to adults. Further research is needed on the subject of adults with learning differences, particularly on adults who exhibit a Math LD. This is echoed by McLeod (1992) and Mighton (2013) who suggests that more research is required on learners' mental state particularly in the area of mathematical academic upgrading supported by technology as math anxiety is directly linked to lower overall performance. Learners can be affected by the finite nature of mathematics – a viewpoint often communicated in math learning contexts. Finding one specific right answer can seem daunting. However, through supported instruction, this pressure to find a precise result can be positively transformed.

Mathematics has the ability to allow one's self-confidence to flourish. Learners will be encouraged by their methods with the reward of a correct answer which can often be self-verified. If we hold a mirror up to society and see what is reflected onto others, it will come as no surprise that parents have often been told to 'read to your children' as it will assist them with vocabulary acquisition. However, it is rare to hear that parents are told to 'count with your children' to improve their numeracy. This could be the catalyst of math becoming a subject that is socially acceptable to bad at. This needs to change, and that change begins with a shift in attitude. We should be encouraging the use of math in everyday activities, whether it be cooking, playing games, simple counting, or estimation – all of which contribute to the development of an individual's number sense. Instead of supporting the acceptability of having poor math skills, we should support the building of confidence to persist and to ask questions if clarity is needed. It is critical to recognize whether poor math acquisition is due to an actual cognitive disability or

inadequate instruction, inconsistent attendance, or poor motivation (Patton et al., 1998; Butterworth, 1999; Geary, 2004; Fuchs & Fuchs, 2005; Beatty & Bruce, 2012).

INSTRUCTIONAL STRATEGIES

Results show potential for technology-based strategies to engage learners and improve their math skills (Gleason, 2006; Wadsworth, Husman, Duggan, & Pennington, 2007; Zavarella & Ignash, 2009; Loong, 2011; Guerrero & Crites, 2013). Instructional technology can be a motivating factor for adults with a LD as they initially engage with the task at hand, with the condition that they are provided with the necessary instruction to use the technology adequately and without difficulty (Hock, 2012). A program with careful consideration given to its instructional design can be of particular support to any learner, including those with a LD (Hashey & Stahl, 2014; Hall, Cohen, Vue, & Ganley, 2015). Other recommended strategies in assisting educators to close the gap between learners include: immediate feedback, scaffolding math techniques, and plenty of practice (Mighton, 2013). Wadsworth's et al. (2007) findings also suggest that immediate feedback, in addition to the use of practice tests and access to an online tutor are all beneficial to the learner's success. On the other hand, not everyone agrees that immediate feedback is the best strategy. Brown, Roediger, & McDaniel (2014) suggest that a brief delay in providing feedback cultivates better lifelong learning. Optional feedback through the use of a guide or tutor is demonstrated by the success of Maloy, Edwards, & Anderson's (2010) tutoring system that promotes inquiry learning and problem-solving methods while using multi-level hints and virtual coaches to assist learners.

Not every strategy tested is a victory. Zavarella & Ignash (2009) found using the Grasha-Reichmann Student Learning Styles Scales (GRSLSS) that a student's learning style does not have an impact on whether a community college student withdraws or completes a course.

Additionally, Wadsworth et al. (2007) also discovered that the more self-assessments a learner completes the lower their overall achievement.

CLOSING COMMENTS

A review of the literature has confirmed that low attendance and mathematical limitations are two oft-encountered barriers in adult upgrading programs. The daily life of an adult learner is may not always be simple; they are often involved in a variety of activities, in the context of their work, family, and community. It is no surprise that there is a long history of adults pursuing academic upgrading, all the while juggling other responsibilities. This is in large part why consistent attendance of upgrading programs has required creative solutions. With regards to the subject of mathematical limitations, the literature indicates that this is an area in need of attention (Patton et al., 1998; Butterworth, 1999; Mazzocco, 2005; Hock, 2012). Although there have been numerous studies and research projects attempting to find the most effective strategies to reach adult learners with an optimum approach to mathematics instruction, some attempts have been more successful than others. If a study were conducted that focused on the specific issues that impact a learner's barrier to mathematics achievement, this could provide the necessary information to fill the gap within the literature of why some learners struggle with mathematics. To best provide for our adult learners in Nova Scotia, we need to ask the questions that have not been asked before, to confirm or deny the potential variables that could influence the lifelong learning paths of the adults in our community.

Chapter 3

METHODOLOGY

RESEARCH QUESTIONS:

The questions that my quantitative research aims to answer are as follows:

- 1) To what extent do adult learners enrolled in an urban academic upgrading program have difficulty maintaining regular attendance and attaining mathematical achievement?

In particular:

- i) What are the barriers to adult learners' ability to maintain regular attendance?
- ii) What are the barriers to adult learners' ability to attain mathematical achievement?

For this research, an urban academic upgrading program is defined as a preparation program offered by a not-for-profit community-based learning organization located in central Halifax, Nova Scotia. An individual that has difficulty maintaining regular attendance can be viewed as someone with inconsistent attendance. In other words, adult learners in this program who are absent for more than 30% of their scheduled classes are considered at risk of being withdrawn due to the failure to abide by the organization's rules and regulations. Learners who attend less than 50% of the scheduled 18 classes per week are at considerable risk of being removed from the program. Realistically, individuals at risk are discussed in monthly staff meetings and unless extraneous circumstances are identified, they are withdrawn from the program to afford the space for an assessed learner on the waiting list. Mathematical achievement is attained if the learner has demonstrated a proven understanding and knowledge of the material presented. It shall be understood that an overall grade of 70% or higher shows the necessary understanding of concepts covered. The mark of 70% has been agreed upon by all members (management and

faculty) of the Cunard Learning Centre as the benchmark of understanding for assessments, exams, and overall comprehension of the concepts covered.

PARTICIPANTS:

The general demographics of the adult learners participating in this research study is that of an adult learner who was enrolled in either Level II or III (of an ascending four level provincial ALP) offered at an urban community learning organization in Halifax, Nova Scotia, between the years 2011 and 2015. This comprises a convenience sample of approximately 200 adult learners. These learners range in ages between 18 years and 66 years old. The study is open to any learner who attended the Cunard Learning Centre during this time period, as the researcher has first-hand experience with the attendance rate and mathematical abilities of these learners. It is also during this time period that the principal investigator actively observed the patterns identified by the previously mentioned barriers.

Since the participants answer a survey based on the experiences they had enrolled in an ALP in Halifax, Nova Scotia, as an adult learner in general, there is little benefit to attribute a specific date to their answers. This study offers a more general perspective by including Haligonian adult learners at varying points on their learning path. There is no conflict of interest between the researcher and the participants as the researcher is no longer affiliated with the CLO offering the ALP that the participants were enrolled in.

Inclusion criteria consists of learners who have already completed or have been withdrawn from the program, either voluntarily or as a result of a breach of the rules and regulations of the organization, such as withdrawn due to poor attendance – particularly less than a rate of 50%. It is important to include both voluntary and non-voluntary withdraws in this

study to ensure that the viewpoint of both is considered – particularly when low attendance is the most likely cause for dismissal.

Exclusion criteria necessitates that each participant that answers the online survey has a working email address by which they can be contacted. Participants are given the option to choose to be contacted in the future should they wish to take part in additional research, comparing instructional techniques with relation to mathematics instruction. Participants are also given the opportunity to include an email address to indicate that they would like to be provided with a copy of the results of the research study.

The research is conducted with participants that are able to provide consent and, due to the nature of the adult learner population in an urban Halifax CLO, may involve adult learners from a variety of cultural backgrounds (international learners, indigenous learners, African-Canadian learners). This implies that the collected data is indicative of the diversity of the adult learner population in this ALP. Limitations of language were considered when creating documents where consent is needed.

MEASUREMENTS:

The measurements used during this research study include a record review conducted through an urban community learning organization. Data collected from the attendance records of 188 participants are compiled to find the arithmetic mean of the attendance rate for the average adult learner from the study's population of interest. As the information for the record review is accessible without contacting the participant, all 188 participants are used to provide a more complete representation of the overall attendance in an urban provincial adult learning program. This is not only based on data reported in national statistics (Statistics Canada, 2003)

and provincial reports (NSSAL, 2014) but on the researcher's extensive experience instructing adults. Furthermore, the record review illustrates that the degree of inconsistent attendance is an issue in need of attention. Should the record review have delivered a response of 'no', the survey study would have continued as planned, as the information gained is still of value to the community.

A demographic form and descriptive survey study are employed for the subsequent questions. The survey, created by the researcher to address issues of interest, hopes to touch upon any reasonable influences on the difficulties some learners have with the barriers of inconsistent attendance and the struggle with mathematics. An option for the participant to report any other contributing factors is also included. The demographic form categorizes information such as gender, age, cultural background, as well as level of education, employment, and income. Following the demographic section of the survey, participants are asked to fill out two questionnaires using a 7-point Likert scale to indicate to what level each of the 21 statements is applicable. A 7-point scale was selected to provide participants with a balance between too many or too few options. With a selection of '0' meaning a statement that is not applicable at all, the participant is left with the freedom to express their level of agreeance or not with how applicable the statement is to them – essentially eliminating the possibility of avoiding the commitment to choose a side. With 21 inquiries each, the questionnaires investigate the potential factors that may contribute to the oft-encountered barriers of low attendance and mathematical limitations.

PROCEDURE:

The conducted research uses a quantitative descriptive survey study (see appendix A). This supports a pragmatic research theory with the prospect of being transformative. Originally,

a mixed methods approach was considered, as it would enable a qualitative means to provide a biographical narrative stemming from years of practical experience as a mathematics instructor for adults. However, a survey study and record review not only align more with a quantitative research approach, it offers an efficient method to answer the research questions.

The information gathered through the demographic form and two questionnaires generate data that has the potential to help describe the issues that influence the difficulties a learner may have maintaining regular attendance and/or acquiring a working proficiency in mathematics. This approach allows the data to be aggregated, correlated, and presented numerically, as well as with visual representations. This supports the presentation of validated data in conjunction with the valued opinion of the adult learner enrolled in Level II or III of an ALP in Halifax, Nova Scotia.

The descriptive record review and survey study are designed to better understand the adult learner's rationale for missing Level II or III classes at the Cunard Learning Centre and the reasons behind the struggle with mathematics achievement. In total, 125 participants are sent an email with a consent form enclosed asking them if they would like to volunteer their time to take part in a survey study on the subject of attendance and mathematical limitations in Adult Learning Programs. The content of the email ensures that their privacy is respected and that the process involves minimal risk. Enclosed in the email is a hyperlink that takes them to a secure online survey offered through a reputable Canadian university where they are asked to fill out a demographic form and two questionnaires – one on the subject of barriers to maintaining regular attendance, the other on the subject of mathematical limitations.

The entire survey took approximately 20-25 minutes to complete. Each survey has 21 statements that respondents are to agree or disagree with through the use of a 7-point Likert scale. Participants had a window of 23 days to complete the survey - a reminder email sent with 10 days remaining before the deadline. Participants are also given the choice to take part in future research on the same subject and/or receive the results from the survey they took part in. Once the survey study is complete, they click to submit their answers. The collected data is exported to show the distribution of the responses to each question or statement. When asked for consent, if a participant responds that they have not read the consent letter and/or do not agree to its conditions, any information provided by that individual is not included in the overall data.

The records reviewed for this research study are provided by the Cunard Learning Centre, where attendance is taken for each class by the instructor. A weekly attendance sheet is provided and students are marked with either a 'P' for present or an 'L' for having arrived late or having left early. At the end of each day, this information is transferred, by the instructor, to a master attendance sheet. This information is entered into an excel spreadsheet by administrative staff. Overall attendance is reviewed periodically to determine if a student is meeting the attendance expectations of the program (above 70% attendance rate) or if they are in considerable danger of being withdrawn due to poor attendance (an attendance rate of less than 50%). Attendance records are provided to each student upon receiving their report card. Attendance is presented as a ratio of number of classes attended out of total number of classes, with an additional number of classes in which the learner either arrived late or left early.

When numerical data was shared with the researcher, it was provided with an indication of whether the ratio presented was indicative of overall attendance or overall absence or in some cases a combination of the two. With this under consideration, it is feasible that, in the process of

entering information, human error may have created false identification of absence and/or attendance. It is the hope of this researcher that the administrative staff was diligent in the transference of attendance data.

Chapter 4

RESULTS & DATA ANALYSIS

RESEARCH QUESTIONS:

The following questions are explored within this research study:

- 1) To what extent do adult learners enrolled in an urban academic upgrading program have difficulty maintaining regular attendance and attaining mathematical achievement?

In particular:

- i) What are the barriers to adult learners' ability to maintain regular attendance?
- ii) What are the barriers to adult learners' ability to attain mathematical achievement?

For the purposes of this research study, the unit of analysis is the adult learners, specifically those who attended an urban community learning organization in Halifax, Nova Scotia. The analyzed variables are the attendance pattern and the aforementioned barriers that these adult learners may have. The question of whether inconsistent attendance is an issue is answered by means of the record review conducted on 188 participants. It consists of adult learners who attended levels II or III (of the four-level provincial ALP) in an urban Nova Scotia CLO between the years 2011 and 2015. With regular attendance, the most classes attended in a single week is 18. Throughout the year, statutory holidays and days in which classes were cancelled due to closure as a result of the weather would have an impact on this number. The data from the record review accounts for statutory holidays and days of school closure and does not include them as missed days for the learner.

Choosing this convenience sample provides the researcher with familiarity of both the learners and the in-class curriculum observed. A sample size from one of the few urban CLOs in

the Halifax Regional Municipality amounts to a substantially higher sample than from a rural CLO in Nova Scotia. The record review, conducted with the permission of the Cunard Learning Centre, comes with minimal risk to the participant. To protect the participant's privacy, the data is de-identified so that their attendance record is reduced to only a numerical value (number of classes attended out of total number of classes offered).

Subsequent questions are answered using a descriptive survey study using the above mentioned unit of analysis. The barriers are measured using 21 statements highlighting the issues that might influence Level II and/or III adult learners' attendance rates in a Halifax, Nova Scotia ALP and the factors that contribute to their ongoing struggle with math achievement. Statements are categorized and correlated results show which variables contribute most to the two identified barriers. Participants, contacted via email for their consent, are invited to voluntarily assist with the research using Lime Survey - a secure online survey software provided by Mount Saint Vincent University (www.limesurvey.org). The demographic data is presented on an aggregate level, to describe averages in age, as well as percentages of participants broken down by gender, cultural background, and different levels of education and income.

Anticipated data regarding the contributing factors of the identified barriers are ordinal as a degree of agreement with each statement is acknowledged. This is collected through a 7-point Likert scale including the option to abstain from answering the question. It provides a comparison of the frequency of variables behind these barriers. The descriptive analysis tracks the frequency and the measure of dispersion of the gathered information – for example: 8 participants could have an average score of 5/7 with a range of 3-6 on a Likert scale from 0-6 with 3 abstentions. Overall impact of barriers (all Likert ratings summed across all barriers asked about in the survey) is used to forecast likely causes of inconsistent attendance and mathematical

limitations. The potential to correlate collected data collected with the demographic data can provide a clearer perspective of the rationale initiating the Halifax ALP Level II and/or III adult learner's choices and reasons behind these two barriers.

QUANTITATIVE RESULTS:

In the record review, there are a total of 648 report cards containing attendance data that are reviewed. Within the aforementioned time frame, it is worthy to note that 74.5% of participants have 4 or less report cards and of the 188 records reviewed, only 12 have 8 or more report cards. On average, 402 classes are attended per participant. This stems from a wide range of classes attended: from a minimum of 13 classes to an upper limit of 1,815 classes, over a maximum time period of 5 years. The most classes represented in a single report card is 240 classes. This is equivalent to one academic term or approximately 4 months of the calendar year.

Averages are totaled in two manners. One average (A1) is calculated through the total number of classes attended divided by the total number of classes available to attend. This provides an even playing field when comparing learners' attendance. Otherwise the poor attendance rate of a student from one term could be unapparent within the average of all their attendance rates per term throughout their enrolment. This second average (A2) is calculated by finding the average of attendance rates represented in each issued report card. For the purpose of discussing an individual's attendance pattern, this allows the educator(s) to view discrepancies in attendance pattern more clearly. Outside factors can influence a learner's attendance, and upon closer inspection, this second average can offer a window into how the inconsistencies present themselves. The range of difference between these averages is between 0.1% and 22.8%. A quick breakdown of this difference shows that 39% have no change between the two averages.

Upon first inspection, the fact that 54 participants have a difference of less than 1% may cause pause. However, this is likely due to the 70% of those participants who received only one report card to review. Whereas, 20 participants have a difference of greater than 10%. When considering the information provided in Table 2, we see that the difference between both averages is of little consequence.

	A1	A2
Less than 50% attendance	41.0%	38.8%
Less than 70% attendance	70.2%	68.1%
More than 70% attendance	29.8%	31.9%
More than 90% attendance	4.3%	4.8%

Table 2. The issue of attendance. This table offers a comparison of attendance averages.

Based on the information supplied through the record review, it appears that inconsistent attendance is clearly an issue worth addressing. Without maintaining regular attendance, a learner may not overcome the barriers to participation and may not progress to achieving their goals of mastering the material presented, building the necessary skills, or attaining the performance they deem to be successful (Phillips, 2010; Pickard, 2013; Mellard et al., 2013). The data in Table 2 confirms that inconsistent attendance is an issue. This is evident in seeing that less than 5% have an exemplary attendance record, and only about 30% attend the required 70% outlined in the learning centre's policies and procedures.

Between 2011 and 2015, approximately 250 learners attended the ALP at the Cunard Learning Centre in either Level II or Level III or both. From this survey study, 180 learners provide an email address and are sent an initial email inviting them to take part in an online survey study. This consists of 51 male participants (28.3%) and 129 female participants (71.7%).

The option to not disclose their gender is not offered. However, the option to identify as transgender is available. Although the survey study began with 180 potential participants, 55 learners are excluded due to a failure of delivery to the email address provided. This reduces the number of potential volunteers to 125, 35 of which respond to the invitation email.

Of the 35 those who click on the link to take them to the online survey, 10 do not complete the survey, only 1 participant answers NO to the initial question regarding consent. Of the remaining 9 incomplete surveys, 4 respondents give no answer to the initial consent question, nor any of the questions that follow. Of the 10 incomplete surveys, 5 people answer YES to the initial consent question, but only 1 of those 5 continue to answer questions following the initial consent. The manner in which the survey is designed permits participants to stop and save their responses with the intention of completing the remainder of the survey at a later date. Unfortunately, none of the 9 incomplete surveys have useful data that could be included in this research. This leaves a sample of 26 eligible participants who responded to the demographic questions and the math portion of the survey and 25 eligible participants who responded to the attendance portion of the survey. Of the 125 participants who were invited to take part in the online survey, 25 respondents complete the survey in full, amounting to a response rate of 20%.

The sample is comprised of men (23%) and women (77%) over the age of 18 years old. Based on faculty observation, this ratio is a fair depiction of the balance between male and female learners at the Cunard Learning Centre. Despite the low response rate, the discrepancy within gender representation is minimal (5%). The age of respondents is mostly (77%) between 23 years and 45 years old. Additionally, 11.5% of participants are between the ages of 18 years and 22 years old, and 11.5% of participants are between the ages of 46 years and 60 years old. A visual representation of the disparity of age and gender is available in Figure 3.

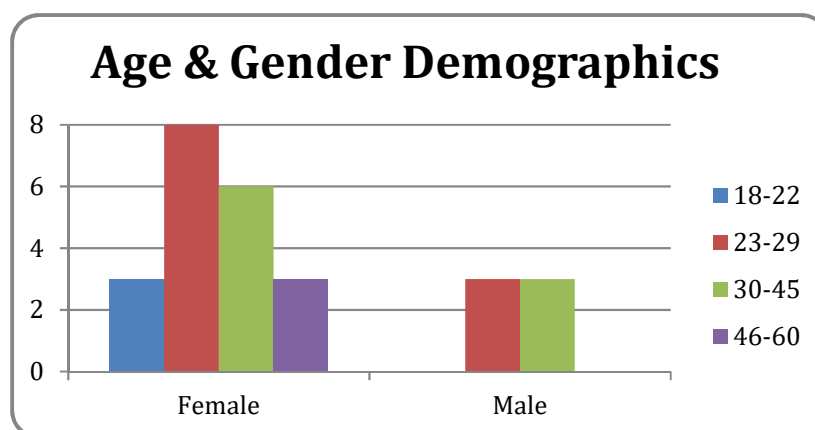


Figure 3. Age & Gender Demographics. This graph denotes the gender of respondents, as well as their identified age category.

Although the cultural background of the email recipients is representative of the community learning organization, the cultural background identified from those who choose to respond is not. The Cunard Learning Centre states that 67% of their learners are newcomers to Canada, representing 12 different countries. The results of the survey tell a different story: 77% Canadian, 12% African-Canadian, 8% International, 4% Aboriginal, as seen in Figure 4.

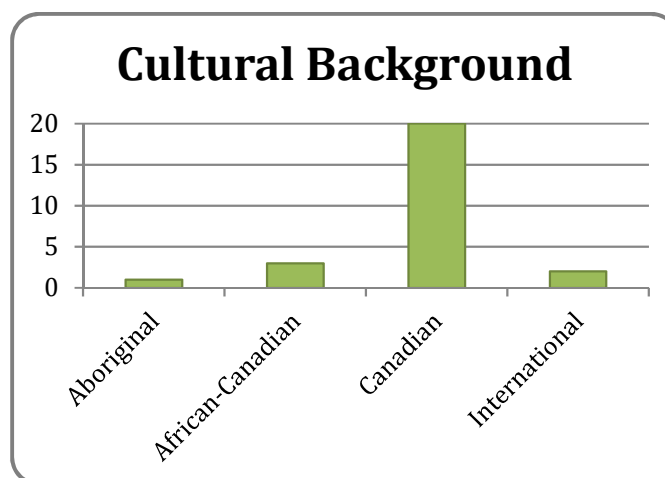


Figure 4. Cultural Background. This graph displays the different cultures represented by the survey respondents.

The disproportion of cultural representation between the student population at the Cunard Learning Centre and of the survey respondents may speak to the comprehension level of the

language used in the survey. This is perhaps a more viable reason than their potential discomfort of responding to a survey online, as 100% of the respondents state that they are comfortable using a computer and the internet.

The percentage of participants who are unemployed is 61.5%. Of those who describe themselves as unemployed, one respondent offers that their time is spent as a volunteer while another identifies as a full-time student. Among the unemployed, 81% are receiving income assistance: 13% from Employment Insurance (E.I.) and 69% from the Department of Community Services (D.C.S.) as shown in Figure 5.

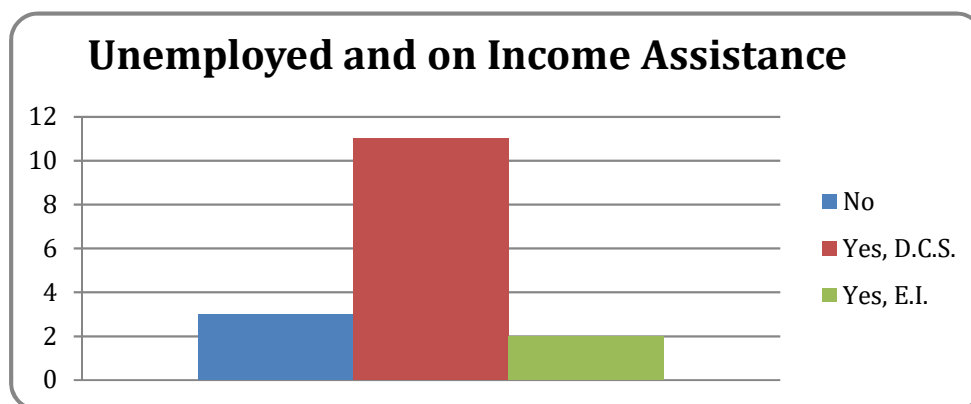


Figure 5. Unemployment and Income Assistance. This graph displays the level of which financial support services are utilised among unemployed respondents.

As shown in Figure 6, more than half (54%) of the respondents have an annual income of less than \$15 000. Statistics Canada (2015) not only states that 7% of Canadians live with a total income of under \$5000 or 6.4% in Nova Scotia, but that 16% of residents of Nova Scotia have an annual income between \$5000 and \$15 000. The results of the socio-economic status of the survey respondents are alarming when compared to the data available through Statistics Canada. A comparison of respondents in the lowest wage bracket with the provincial averages reveals that there is almost twice as many living on an annual income of less than \$5000. Additionally,

the proportion of respondents who live on less than \$15 000 per year is more than double the average percentage of Nova Scotians living on the same amount.

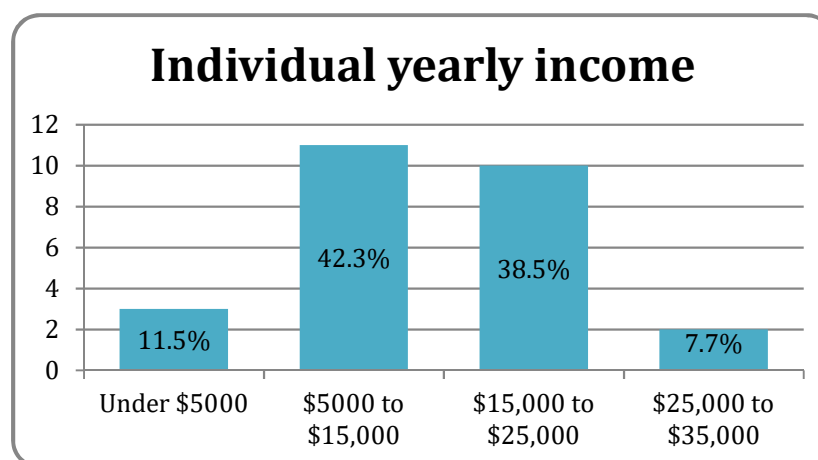


Figure 6. Yearly income. This graph denotes the annual earnings of respondents.

Although the statement in the survey asks participants to identify their individual yearly income, it is not unreasonable to think that some may have responded with their annual household income. This could possibly be a representation of learners who reside together and each answered the survey.

INCONSISTENT ATTENDANCE:

Upon analysis of the data regarding inconsistent attendance it is interesting to note that more than half (56%) of the respondents state that they regularly attend school. This is in direct contrast to the data analysis of the record review which clearly shows that there is an issue with maintaining consistent attendance at the Cunard Learning Centre (see Table 1). Perhaps due to a lack of self-awareness, only 24% disclose that they struggle to maintain consistent attendance.

Of the remaining 19 statements with which respondents could potentially identify underlying reasons of inconsistent attendance, 9 of the options are identified by at least 20% of participants as something that they agree is an influencing factor on their attendance. The count

of how many respondents listed each reason as a legitimate cause of inconsistent attendance is established in Figure 7 with the breakdown of their levels of agreeance displayed in Figure 8.

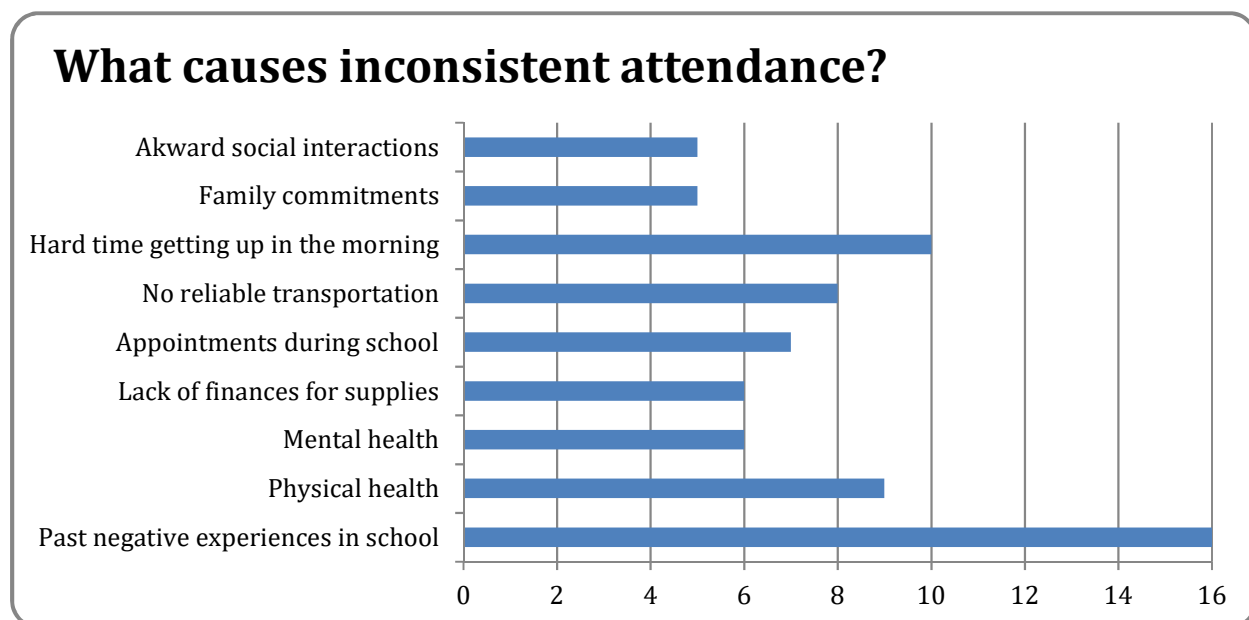


Figure 7. Factors of inconsistent attendance. This graph outlines the intrinsic reasons that at least a fifth of respondents agree as a potential influence on attendance.

Although nearly 58% of those surveyed identify as having not completed high-school, 73% of the respondents state that the reason they did not graduate was because ‘life got in the way’. Those who identified that they achieved their high-school equivalency, either through passing all five of the GED tests or receiving the adult high-school diploma, were not included in the above-mentioned group of non-graduates. When analyzing the data from the attendance survey, one statement receives the largest proportion over all others. When asked why it was difficult to maintain consistent attendance, 64% of the respondents say that a negative experience in previous school settings is of primary significance. Within this group of individuals, only 12% have completed high-school. This supports the literature stating that the lack of a positive

academic experience at a younger age can influence a learner's persistence within their adult upgrading program (Quigley, 1997; Lesgold & Welch-Ross, 2012).

Other notable reasons for struggling with attendance include 40% of the respondents who say they have a hard time getting up in the morning, 32% who do not have reliable transportation, and 36% who identify physical health as a barrier to maintaining consistent attendance. Transportation presents as an issue in this study, contrary to the conclusions of Greenberg et al. (2013) who state that transportation does not account for inconsistent attendance. In this survey not one participant suggests that the location of their school is inconvenient for them. Additionally, attendance is not impacted by the negative effects of bullying. Not a single participant worries about being bullied as a reason to not attend their program of study. This contrasts the emphasis that Raymond (2008) places on peer acceptance.

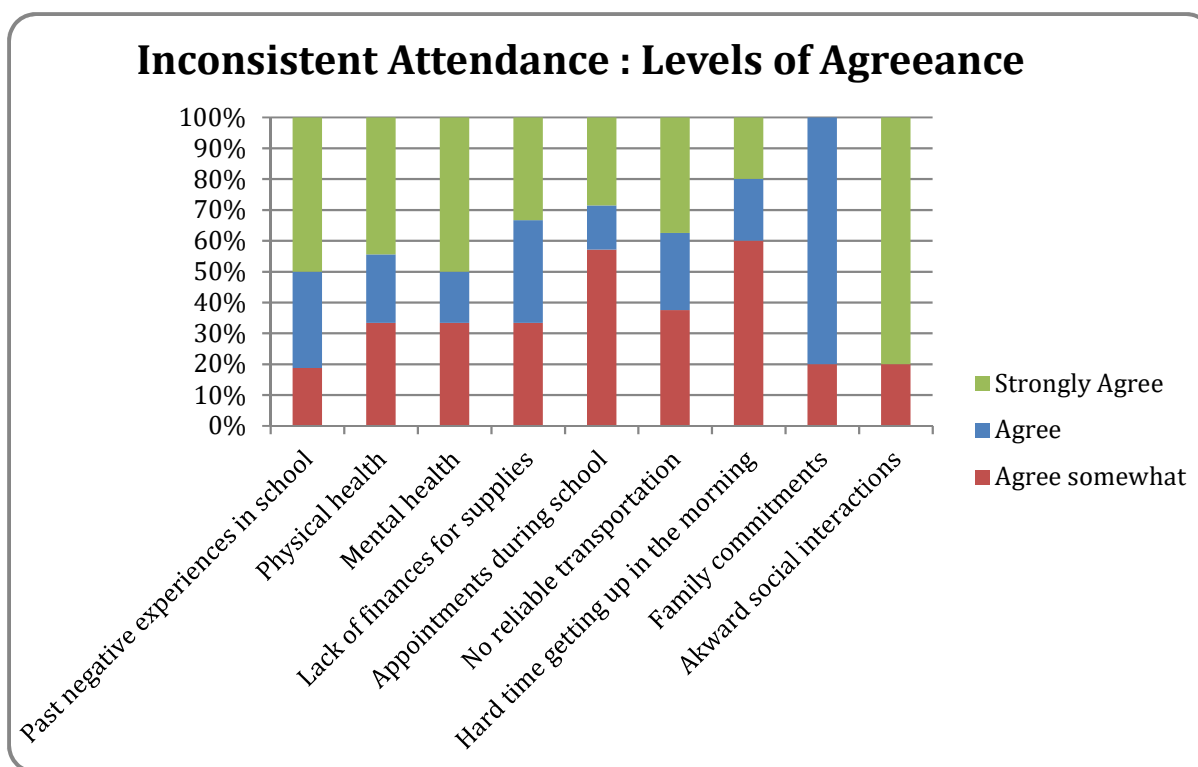


Figure 8. Inconsistent Attendance: Levels of Agreeance. This graph denotes to what extent participants agree with the corresponding statement.

MATHEMATICAL LIMITATIONS:

The first pair of statements that participants are asked to agree or disagree with in this section, provide intriguing results. Although 65% of respondents express that they are at least somewhat confident with their math skills, 92% admit that they would like to improve their math skills. The desire of self-improvement may account for the high percentage of participants who wish to upgrade their numeracy skills. Mastery of a subject, particularly Mathematics, is an ongoing journey.

From the 19 statements that potentially answer why respondents find the subject of Mathematics difficult to master, 14 are worthy of discussion. This occurs when at least 6 of the 26 participants agree that the statements seen in Figure 9 are potential contributing factors behind the struggle toward mathematical acquisition.

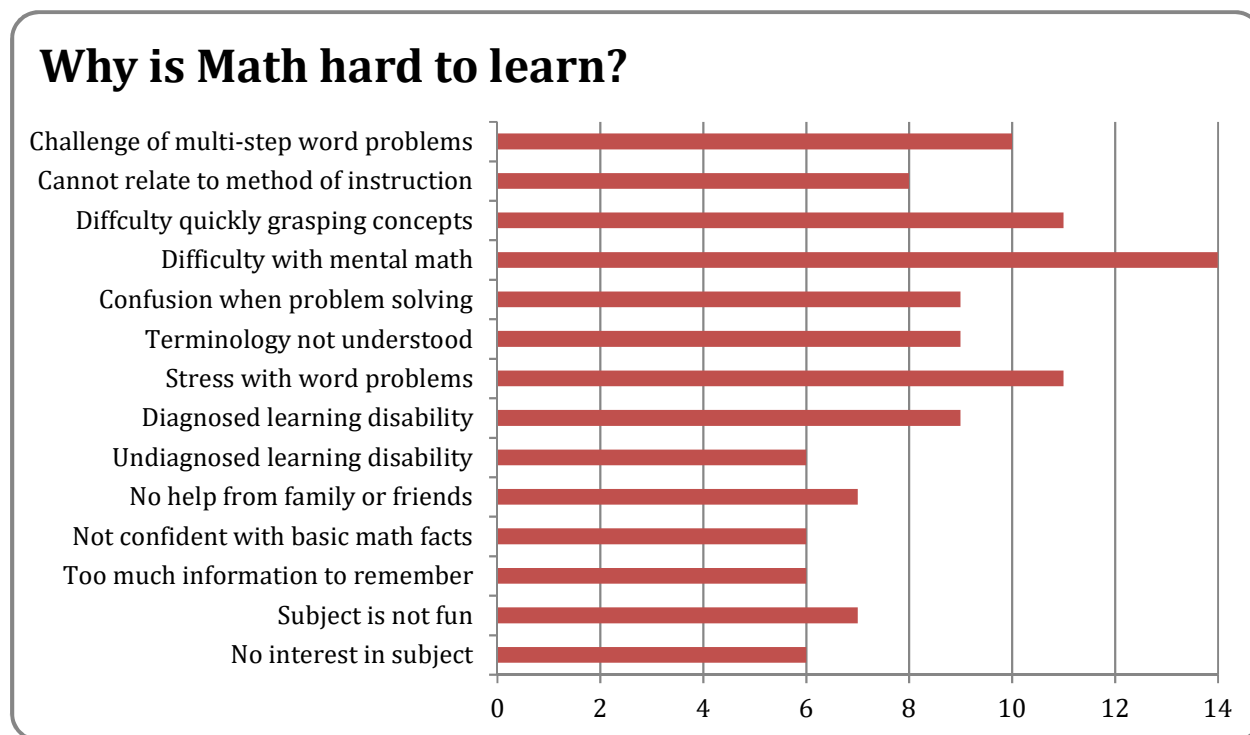


Figure 9. Factors of Mathematical Limitations. This graph outlines the intrinsic reasons that at least a fifth of respondents agree as a potential influence on mathematical limitations.

Of particular interest is that more than half (54%) of respondents agree that it is difficult to do calculations in their head. This is supported by the 42% of respondents who state that math concepts are hard to grasp quickly. Further evidence to the mathematical limitations of Level II and/or III adult learners in an ALP in Halifax, Nova Scotia can be seen in the 30%-40% of those who took part in the online survey who agree to a struggle with multi-step problem solving. The contention with word problems is not unknown. Researchers (McLeod, 1992; Zawaiza & Gerber, 1993; Hock, 2012) have recognized the difficulty that many learners encounter when faced with word problems. Although not always the same respondents, 34% admit to getting lost or confused when attempting to solve problems; 34% also agree that they did not understand the terminology used. Furthermore, 34% of the participants state that they have a diagnosed learning disability. It is worth of noting that when comparing the number of respondents who strongly agree to be diagnosed with a learning disability to those who strongly agree with the statement that they have an undiagnosed learning disability, the numbers are identical.

There are 1 in 4 survey respondents who are in agreeance that math is hard to learn because the subject is of little or no interest to them. This is not surprising when 25% of respondents also think that the subject is not fun. A quarter of respondents admit to having an undiagnosed learning disability. Both a lack of confidence with basic math facts and being presented with too much information to remember are identified as reasons that 25% of participants struggle with math. This is further supported in the literature where math fact retrieval and working memory are repeated topics of discussion with regards to learners with math difficulties (Butterworth, 1999; Geary, 2004; Mazzocco, 2005; McIlroy, 2010). Similarly, 25% of participants indicate that they are unable to access help from either family or friends. See Figure 10 to interpret the varying levels of agreeance seen in responses to the statements in

question. As a side note, 31% of respondents state that they can't relate to the way the material is presented. It is refreshing to see that not one person agrees with the statement: "My parents don't think math is important", perhaps due to the age of some of the participants. Hopefully, this recognized importance of numeracy is passed on to their children.

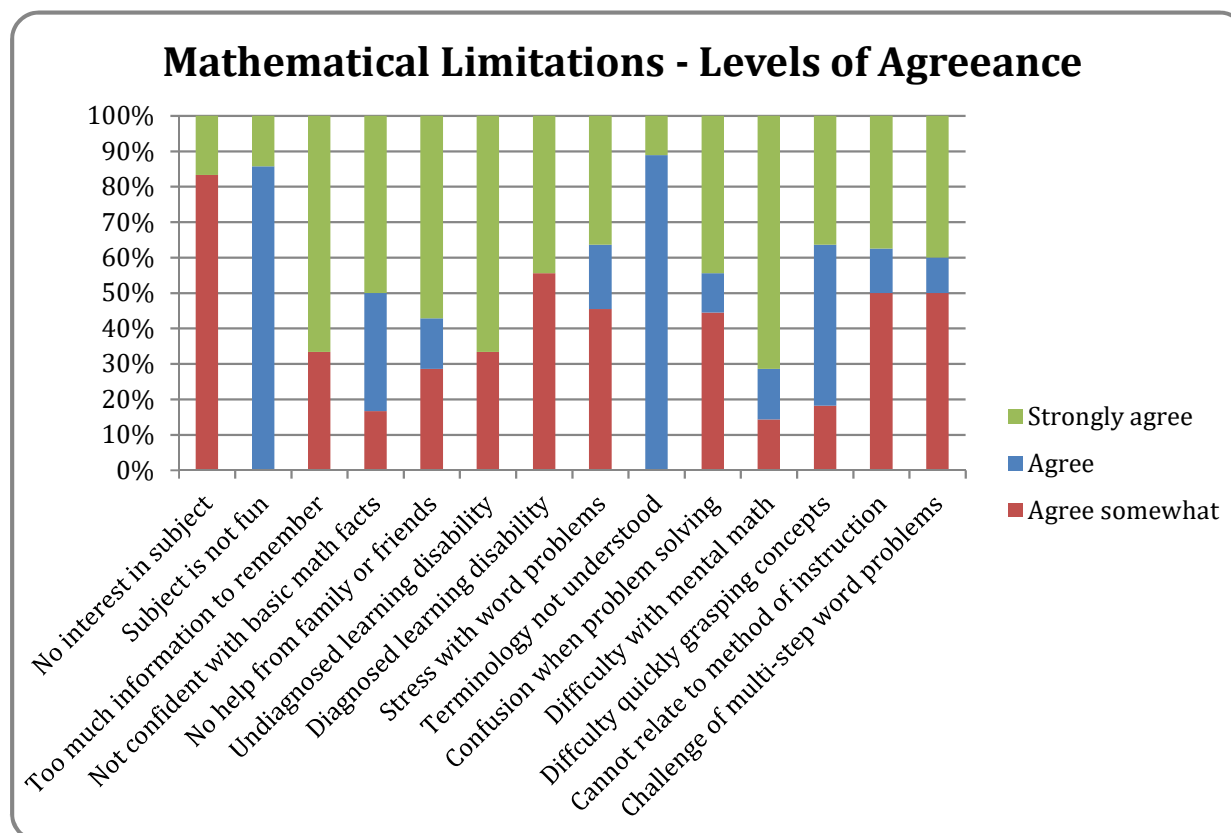


Figure 10. Mathematical Limitations: Levels of Agreeance. This graph denotes to what extent participants agree with the corresponding statement.

Chapter 5

CONCLUSIONS & RECOMMENDATIONS

CONCLUSIONS:

This study examines prominent factors that negatively impact a learner's progress in an adult learning program. The data states that 40% of respondents find it difficult to get motivated in the morning. This upholds what the literature (Houle, 1961; Beder & Valentine, 1990; Comings, 2009; Mellard et al., 2013) attests – motivation is a fundamental component to maintaining regular attendance. With 70% of the learning centre's student population not meeting the organization's required rate of attendance, the record review confirms that inconsistent attendance is a legitimate barrier for adult learners enrolled in this ALP who wish to attain accreditation. Although motivating factors that contribute to a learner's decision to enrol are significant, as seen in the data regarding early morning motivation, the results of this survey show that an additional 25% of participants agree with the notion that previous negative experiences associated with school give cause to inconsistent attendance. These past experiences, no doubt, could compel a learner to withdraw from secondary school prior to accreditation.

For the reasons mentioned, a simple suggestions for a resolution to the barrier of inconsistent attendance should be put forward. Wadsworth et al. (2007) submit that, due to its emphasis on independence, an online learning environment rewards a learners' drive, so much so that the level of motivation that they experience with online learning could surpass that associated with traditional full-class instruction.

An alternative solution to resolve the barrier of inconsistent attendance could be found in the implementation of an incentive program. Through the use of incentives, the most popular

being the ability to leave five minutes early from class, Phillips (2010) notices that perfect attendance doubled over the 45 day study with a 48% reduction in students who missed six or more days of classes. Similarly, Ziegler, Ebert, & Cope (2004) suggest that the introduction of a cash-incentive program for GED learners in Tennessee contributes to their success, notably for those on income assistance. On the other hand, Brooks et al. (2008) conducted an innovative randomised control trial studying the effectiveness of financial motivation on attendance for learners in an adult literacy class in the United Kingdom. Their findings indicate that the offer of incentives caused the contrary effect with a decline in attendance. Much like in life, money may not always be the answer to every problem. The notion of using incentives to encourage attendance in adult upgrading programs deserves more attention, with particular focus on which incentives are the most effective motivators for certain learners and in what context (Lesgold & Welch-Ross, 2012).

Additionally, further discussion should occur with regard to the results of the survey study, in which 64% of participants state that their previous negative experiences with school have an influence on their decision to attend classes. A potential resolution could be to address the negative experiences that a learner may have felt in the past with the hope to relieve undue stress and anxiety associated with academic upgrading. Quigley's (1997) Prior Schooling and Self-Perception Inventory could be an important piece of the intake process to improve the motivation of adult learners and help them maintain consistent attendance in their upgrading program. It allows the learner to reflect on their academic experiences of the past and provides the opportunity to separate those feelings from the expectations they may have for the adult upgrading program. If acknowledging the past offers the potential likelihood for an adult learner to move past the negative experiences associated with academics, than it is our duty as adult

educators to take that chance. Otherwise, “what a misfortune, to let schooling interfere with education” (Allen, 1894, p. 129).

The limits of this study manifest in the lower than expected response rate. The final count of completed surveys weakens the credibility of the research. The language selected for the statements may have been at a higher communication level than an international respondent could devise. Additionally, a lack of specificity in the phrasing of the statements invites ambiguity in the analysis. Nevertheless, the completed questionnaires are invaluable to inform the necessary instructional strategies, particularly the survey with learner-identified reasons behind mathematical limitations. Although several surveys have been successful in measuring the influences on math anxiety (Fennema & Sherman, 1976; May, 2009; Buelow & Frakey, 2013) and motivation to attend (Houle, 1961; Boshier, 1971; Boshier & Collins, 1985; Furst & Steele, 1986; Darkenwald & Hayes, 1986), it is prudent to maintain flexibility to the suggestion of different perspectives on the subject.

Future studies on the barriers of inconsistent attendance and mathematical limitations could benefit from using a qualitative longitudinal approach to best represent students on their lifelong learning path (Reder, 2012). Moreover, corroboration through similar studies done on a larger student population could confirm the validity of conclusions reached in this research. Additional research on these two barriers could further the discussion surrounding online learning as a potential solution. In doing so, particular care should be given to the instructional design of the program offered. To consider resolving the issue of attendance through the use of an online learning environment, it should not only have an online presence, the overall experience must also engage the learner, encouraging them to remain committed to their upgrading journey.

DISCUSSION:

Although adult upgrading programs provide adult learners with a second chance, what can be done should they fall through the cracks again? If a second safety net is in place, it would allow for one's skills to be upgraded without the barriers of inconsistent attendance and mathematical limitations impeding success.

Consider the following scenarios. Although they were created by the researcher, they do reflect typical issues faced by the adult learners enrolled at the Cunard Learning Centre.

- Rima, a Syrian refugee recently arrives in Halifax. Her education ended at grade 5, as she had to help her mother raise her four siblings. Due to civil unrest, her family fled the war-torn country and they eventually found themselves in Canada.
- Constance, a shy student who struggles in high-school, both socially and with her understanding of algebra. Her mother never graduated and therefore she met no resistance when she decided to drop out before completing grade 10.
- Arlo and his girlfriend, while attending school, discover that they are pregnant. Arlo decides to quit school in order to start earning a steady income to help support his new family. Arlo has been diagnosed with ADHD and has been told that this is why he struggles with math.

Ten years later...

- Rima, now in her mid-twenties, is interested in improving her academic skills so that she can pursue a career as a continuing care assistant. She is enrolled in an ALP and although

she struggles with her studies, she is a hard worker and eager to learn. Unfortunately, her attendance is suffering due to her work schedule. She cleans rooms at a motel to contribute to the family income. Rima needs a solution that works for her. How long before she is caught in an educational net that suits her needs?

- Constance wants to be more independent. She recognizes the need to upgrade her academic skills and wants to get her high-school diploma and ultimately enrolls in an ALP. Despite initial best intentions, Constance stops attending classes after two weeks because she feels awkward socializing with the other adult learners in her program and is overwhelmed with the amount of material being covered.
- Arlo is now interested in a career. He also recognizes the need to upgrade his academic skills, as he needs to get his GED as a pre-requisite for a trade program offered by the provincial college. So, he too, enrolls in an adult upgrading program. Arlo lives over an hour away from the nearest CLO and often finds it difficult to get transportation to attend classes.

How can adult instructors come to the rescue of those who slip through education's fingers? If incentives do not have the desired affect, as was the case with Brooks, et al. (2008), an online learning environment may benefit the adult learners who experience difficulties maintaining regular attendance and/or acquiring a working proficiency in mathematics. As adult educators, we recognize that learning is a lifelong process. The information we share amongst ourselves is essential to our professional development. Adjusting traditional classroom instruction requires an embracement of adaptability to new trends. Conrad & Spencer (2006) affirm that online learning has the potential to "serve the social purposes of adult education that demands authenticity,

openness, critical thinking, purposeful and respectful reflection, and the promotion of participatory democracy and citizenship” (p. 311).

RECOMMENDATIONS:

Terry (2001) advances that both Frontier College and the Antigonish Movement showcase three educational philosophies: liberalism, progressivism, and humanism. A liberalist approach to education is evident through Fitzpatrick’s deficit model to educate people in remote locations and within the Antigonish Movement where learners were taught about the methods and reasons behind the education. Frontier College continues to embrace the progressive view that all people are deserving of an education and provides them with individualized lessons. Rooted in social progress, the Antigonish Movement encouraged development of self and in turn improved the socioeconomic standing of the community. Humanism is apparent in the self-direction and independence exhibited by the learners of Frontier College and the Antigonish Movement. The examples listed above are comparable to traits found within online learning. Independence - for all, wherever they may be, through self-direction and self-development. Regardless of the medium, the instructional design of an adult upgrading could be designed to account for known mathematical limitations of certain adult learners.

INSTRUCTIONAL STRATEGIES:

A manner in which to proceed with the instructional design to maximize mathematical acquisition is to consider multi-sensory approaches. It is in math’s nature to have the possibility of reaching a correct response on many different paths. This fosters the sentiment of raising learners’ awareness to alternate approaches for similar problems. A vigilant educator might consider multiple instructional components, designed to address the multitude of difficulties

experienced within the process of understanding mathematical concepts. In view of the prevalence of math difficulties amongst several adult learners, consideration for the learner with an MLD would be appropriate.

Take into account that a quarter of the Haligonian adult learners that responded to the survey agree that basic number facts are difficult to comprehend. The option to improve one's grasp of number facts would be advised, and it can be accomplished through practiced counting. Heed the suggestion to encourage counting on from the designated value rather than counting all of the individual digits (Butterworth, 1999; Geary, 2004; Kaufmann et al., 2011). Mindful repetitive activities, not rote exercises, should be practiced often but in small quantities. Other strategies involve relating activities to real-world examples that are familiar to the learner, and having an awareness of common retrieval errors – such as for the problem $6 + 2$, where 7 and 3 are provided as potential answers as they are the numbers that follow in the counting sequence. Additional activities could include: sequence pennies by date; using clocks to count by 5 & 15; using coins to count by 5, 10, 25; matching place value to base ten blocks; using graph paper for alignment; highlighting columns (ones, tens, hundreds...); and mental math multiplication (Pilmer, 2007).

In response to 54% of respondents agreeing that they struggle with mental math, the approach should be given careful consideration. Learning techniques, like mental math, play an integral part in developing self-confidence and automatic retention of acquired skills. “A handful of techniques is all that it takes to multiply in your head, quick and easily” (Benjamin & Shermer, 2006, p. 4). A solution to learners presenting with difficulties to storing or accessing arithmetic facts can be remedied with focused practice involving fact families. Students who take ownership of their learning by maintaining a reference guide or math journal of tips, examples,

or rules re-affirm their newly acquired skills. This can lead to improved reaction time and retrieval abilities. Additional activities include: a virtual interactive estimation station where various sized containers hold various sized items; other interactive activities; estimation of measurements and verification with appropriate measuring tool; recognition of a minute passing with eyes closed; metaphors and mnemonics; and intransitive pattern counting (starting anywhere, using any sequence). These would, no doubt, be welcomed strategies for the 42% of respondents who state that they find it hard to quickly grasp math concepts.

Numbers can be used as labels or the actual measurement of something. Let's look at how symbols and language are deeply rooted in mastering math concepts. To create mathematical meaning, we use language effectively to provide a rich description for developing a deeper understanding of the process, making the invisible visible. Automaticity comes with accessing math facts as we recall word meanings (Pimm, 1995). Other suggested strategies are: pre-teaching new terminology to improve comfort level with terms (after defining transfer as 'to move', assess understanding of transference of skills); using different vocabulary to describe a concept (half past six or six thirty); and, based on ten years of experience teaching adults math, the adding of humour or math merriment to instruction can improve student engagement and attendance. Additional activities include: word play; a math word wall to reference; pointing out that 3×2 is equivalent to $3 \cdot 2$, $3(2)$, $3[2]$, $(3)(2)$; having learners reflect about what a number means to them; and using think-aloud techniques.

When we use a mental number line, we visualize mathematics. Instructors can stimulate a learner's visual senses by assuring that students have access to a variety of learning tools. Visual-spatial systems are involved in representing forms of conceptual knowledge, such as number magnitudes, representing & manipulating information in a spatial form. The quality of spatial

awareness is an asset for the instructor with a visual learner. A cognitive graphic designer can promote stress reduction through uncluttered pages. Learners can be stimulated with multi-sensory math manipulatives. Additional activities could include: the virtual creation of 3D shapes (related to real life objects); mock purchase from provided menu; matching coin equivalencies; and the use of accessible layouts.

With regards to cognitive development, to monitor academic growth, provide learners with opportunities to respond and seek clarification between novel and familiar problems. When understanding breaks down, students can feel as if they are drowning in the deep end of the pool of perplexity. Due to this anxiety, they will avoid situations likely to cause it. It is, therefore, crucial to know what each learner does and does not comprehend. Monitor students so that immediate corrective action can occur to improve faulty or incomplete understanding. A poor understanding of the concepts underlying a procedure can contribute to a developmental delay in the acquisition of more complex concepts and reduce ability to detect procedural errors (Geary, 2004). Additional activities might include: reflective practice (improves procedural competencies); allowance for a pause during instruction (supports clarification of knowledge); identification and correction of misconceptions; and the facilitation of small group instruction.

Processing efficiency is lower for individuals who experience high-anxiety. Working memory is related to the speed of fact retrieval and can contribute to the tendency to undercount or over count (Geary, 2003). A solution to difficulties tracking the sequence of partial products and correct positioning of carrying over numbers may be found using the lattice method; just as BEDMAS may help make the necessary connections when solving with the order of operations. Additional activities could include: using instructional technology for functionality with an ATM or debit machine; facilitating the execution of appropriate operations; guiding procedures by

providing a framework to evaluate accuracy; building upon math facts; and supporting retrieval-based processes - moderate by confidence.

In recognition that the identified leading issues of grasping math concepts quickly and struggling with mental math, feeling challenged or stressed from word problems are the statements most respondents agreed with. Word problems should be recognized as a means to transfer skills to real world situations. The acknowledgement of mathematical rules & procedures suggests that instructors review key math words and explain harder terms. Be mindful to keep the material interesting and relatable to learners. Additional activities might include: highlighting key words; using checklists to organize information; encouraging learners to check the reasonableness of their answers; labeling activities (words, symbols, monetary signs); supplementing text-heavy exercises with visual diagrams; asking your learners to create problems to solve themselves.

D'Arcangelo (2001) discusses how Butterworth explores and conveys the importance of being aware of math's cumulative process. Math is like a house of cards: the cards in the bottom layer must be firmly and accurately constructed if they are to support the next layer up. Each stage depends on the last. If a lower level is shaky, the house will eventually fall down. Unchecked, the gap between concepts being taught and students' understanding could get wider and wider. This necessitates the inclusion of formative assessment through keeping track of learners' progress, identifying where further focus is needed, and establish that a firm understanding is reached before moving on. Additional activities could include, but are not limited to: mock auctions where bids can be made for: extra time, positive feedback, or an appropriate reward; math contests that challenge the learners' acquired knowledge; the use of

pre-assessments to compare with post assessments; and weekly math challenges to review the skills that the learners have acquired.

NEXT STEPS:

Knowledge gained through this research study can potentially be shared with four different groups: adult instructors; the CLO from which the data stem; the Nova Scotia Department of LAE; and the participants themselves. First and foremost, the information gathered from this survey study best serves other instructors who work within the adult upgrading programs. The sharing of this information could occur through the potential publication of an article in a reputable academic journal. The data would then be accessible to anyone in the field of education interested in the intrinsic influences behind the barriers of mathematical limitations and/or inconsistent attendance.

The option also exists to present an information session to other adult instructors through Literacy Nova Scotia's annual professional development conference for practitioners. The findings from this study could inform adult instructors with regards to the contributing factors behind two oft-encountered barriers in the world of adult education. This has the potential to impact the instructional strategies used when teaching mathematics to adults. With a clearer understanding of the variables that contribute to the challenges faced by the adult learners enrolled in Level II and/or III of an ALP in Halifax, Nova Scotia, educators can tailor their instruction to help mitigate these barriers.

Additionally, results can be communicated to the CLO from which the convenience sample was drawn in an aggregated form without identifiable markers of who participated. This would provide the organization with information about inconsistent attendance, which they can

use to inform future program decisions. Moreover, sharing of the research results is available to participants who have indicated an interest in them. Interest in the discussion of this research could stem from awareness that each participant's willing contribution has the potential of indirectly improving the way in which adult education is delivered.

Ultimately, the data from this study has the potential to influence the way in which the province chooses to offer accreditation. Ideally, this research will give way to the consideration of an online learning environment, sanctioned by the Department of LAE and NSSAL, offering an alternative to mathematics instruction, free of charge, for adults anywhere in the province. Just as Frontier College and the Antigonish Movement were an answer to the problems that educators and adult learners in Canada faced at the turn of the 20th century, the digital revolution changes the way that information and knowledge acquisition is perceived at the turn of the 21st century. All the while staying true to Mezirow's (1981) definition of andragogy, in which educators make a "sustained effort to assist adults to learn in a way that enhances their capability to function as self-directed learners" (p. 21).

REFERENCES

- Allen, G. (1894). *Post-Prandial Philosophy*. London: Chatto & Windus.
- Allen, P., Smith, A., Jerge, K., & Vires-Collins, H. (1997). Age differences in mental multiplication: Evidence for peripheral but not central decrements. *Journal of Gerontology: Psychological Sciences*, 52B(2), 81-90.
- Bean, J. & Metzner, B. (1985). A Conceptual Model of Nontraditional Undergraduate Student Attrition. *Review of Educational Research*, 55(4), 485–540.
- Beatty, R. & Bruce, C. (2012). Supporting students with learning disabilities to explore linear relationships using online learning objects. *Pensamiento Numerico y Algebraico*, 7(1), 21-39.
- Beder, H. (1991). *Adult literacy: Issues for policy and practice*. Malabar, FL: Krieger Publishing Company.
- Beder, H. W. & Valentine, T. (1990). Motivational profiles of adult basic education students. *Adult Education Quarterly*, 40(2), 78-94.
- Beier, M. & Kanfer, R. (2010). Motivation in training and development: A phase perspective. In S. Kozlowksi & E. Salas (Eds.), *Learning, Training and Development in Organizations* (pp. 65-97). New York: Routledge Academic.
- Belzer, A. (1998). Stopping Out, Not Dropping Out. *Focus on Basics*, 2(A). Retrieved from the National Center for the Study of Adult Learning and Literacy (NCSALL) at <http://www.ncsall.net/index.html?id=417.html>
- Benjamin, A. & Shermer, M. (2006). *Secrets of Mental Math*. New York: Three Rivers Press.
- Bill No. 126: Adult Learning Act*. 1st Reading, December 2, 2010, 2nd Session, 61st General Assembly, Nova Scotia. Department of Labour and Workforce Development.

- Blunt, A. & Yang, B. (2002). Factor structure of the adult attitudes toward adult and continuing education scale and its capacity to predict participation behavior: Evidence for adoption of a revised scale. *Adult Education Quarterly* 52(4), 299-314.
- Boshier, R. (1971). Motivational orientations of adult education participants: A factor analytic exploration of Houle's typology. *Adult Education Journal*, 21, 3-26.
- Boshier, R. & Collins, J. (1985). The Houle typology after twenty-two years: A large scale empirical test. *Adult Quarterly*, 35(3), 113-130.
- Bowen, E., Price, T., Lloyd, S., & Thomas, S. (2005). Improving the quantity and quality of attendance data to enhance student retention. *Journal of Further and Higher Education*, 79(4), 375-385.
- Brooks, G., Burton, M., Cole, P., Miles, J., Torgerson, C., & Torgerson, D. (2008). Randomised controlled trial of incentives to improve attendance at adult literacy classes. *Oxford Review of Education*, 34(5), 493-504.
- Brown, P., Roediger, H., & McDaniel, M. (2014). *Make it stick: The science of successful learning*. Cambridge, Massachusetts: Belknap Press.
- Buelow, M. & Frakey, L. (2013). Math anxiety differentially affects WAIS-IV arithmetic performance in undergraduates. *Archives of Clinical Neuropsychology*, 28, 356-362.
- Butterworth, B. (1999). *What counts: How every brain is hardwired for Math*. New York: The Free Press.
- Carr, T. (2014). *Impact of attendance policy on adult college learners* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (AAT 3612070)
- Coady, M. (1939). *Masters of their Own Destiny*. New York: NY: Harper.
- Comings, J., Parella, A., & Soricone, L. (1999). *Persistence among adult basic education students in pre-GED classes*. Cambridge, MA: National Center for the Study of Adult Learning and Literacy.

- Comings, J. (2009). Student persistence in adult literacy and numeracy programs. In S. Reder & J. Bynner (Eds.), *Tracking adult literacy and numeracy skills: Findings from longitudinal research* (pp. 160-176). New York, NY: Routledge.
- Conrad, D. & Spencer, B. (2006). Distance education online: A forum for adult education. In T. Fenwick, T. Nesbit, & B. Spencer (Eds.), *Contexts of adult education: Canadian Perspectives* (pp. 307-315). Toronto, ON: Thompson Educational Publishing.
- D'Arcangelo, M. (2001). Wired for mathematics: A conversation with Brian Butterworth. *Educational Leadership*, 59 (3), 14-19.
- Darkenwald, G. & Hayes, E. (1986). *Adults' Attitudes towards Continuing Education*. Hollywood, FL: Paper presented at the National Conference of the American Association for Adult and Continuing Education.
- Erbstein, N. (2014). *Factors influencing school attendance for chronically absent students in the Sacramento City Unified School District*, University of California, Davis. Retrieved from <http://explore.regionalchange.ucdavis.edu/ourwork/publications/chronic-absence-scusd/factors-influencing-school-attendance-for-chronically-absent-students-in-the-sacramento-city-unified-school-district-scusd>
- Fennema, E. & Sherman, J. (1976). Fennema-Sherman mathematics attitude scales: Instruments designed to measure attitudes toward the learning of mathematics by females and males. *Journal for Research in Mathematics Education*, 7, 324-326.
- Fisher, R., & Engemann, J. (2009). *Factors affecting attrition at a Canadian College*. Unpublished manuscript, Canadian Council on Learning. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.522.682&rep=rep1&type=pdf>
- Fitzpatrick, A. (1920). *The university in overalls: A plea for part-time study*. Toronto, ON: Hunter-Rose.
- Fuchs, L. & Fuchs, D. (2005). Enhancing mathematical problem solving for students with disabilities. *The Journal of Special Education*, 39(1), 45-57.

- Furst, E. & Steele, B. L. (1986). Motivational orientations of older adults in university courses as described by factor and cluster analyses. *The journal of experimental education*, 54(4), 193-201.
- Geary, D. (2003). Learning disabilities in arithmetic: Problem-solving differences and cognitive deficits. In H. Swanson, K. Harris, & S. Graham (Eds.), *Handbook of Learning Disabilities* (pp. 199-212). New York: The Guilford Press.
- Geary, D. (2004). Mathematics and learning disabilities. *Journal of Learning Disabilities*, 37(1), 4-15.
- Gleason, J. (2006). Teaching mathematics online: A virtual classroom. *Journal of Online Mathematics and its Applications*. Retrieved from the Mathematical Association of America's website at <https://www.maa.org/press/periodicals/loci/joma/teaching-mathematics-online-a-virtual-classroom-abstract>
- Gordon, H. (1993). Houle's typology: *Time for reconsideration*. Nashville, TN: Paper presented at the American Vocational Education Association Convention. Distributed by ERIC <http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=ED363785>
- Greenberg, D., Wise, J., Frijters J., Morris, R., Fredrick L., Rodrigo V., & Hall, R. (2013). Persisters and nonpersisters: Identifying the characteristics of who stays and who leaves from adult literacy interventions. *Reading and writing* 26(4), 495-514.
- Guerrero, S., & Crites, T. (2013). Technology in an online graduate mathematics education program. *Computers in the Schools*, 30(1-2), 191-206. doi: 10.1080/07380569.2013.769929
- Hall, T., Cohen, N., Vue, G., & Ganley, P. (2015). Addressing learning disabilities with UDL and technology: Strategic reader. *Learning Disability Quarterly*, 38(2), 72-83.
- Hashey, A. & Stahl, S. (2014). Making online learning accessible for students with disabilities. *Teaching exceptional children*, 46(5), 70-78.

- Hock, M. (2012). Effective literacy instruction for adults with specific learning disabilities: Implications for adult educators. *Journal of Learning Disabilities, 45*(1), 64-78. doi: 10.1177/0022219411426859
- Hocking, C. L. (2008). *The contributing factors to student absenteeism/truancy and the effectiveness of social services and interventions*. Retrieved from Providence College's Digital Commons at:
http://digitalcommons.providence.edu/cgi/viewcontent.cgi?article=1017&context=social_wrk_students
- Hopko, D., Mahadevan, R., Bare, R., & Hunt, M. (2003). The abbreviated math anxiety scale: Construction, validity, and reliability. *Assessment, 10*, 178-182.
- Houle, C. (1961). *The inquiring mind*. Madison: University of Wisconsin Press.
- Houle, C. (1979). Motivation and participation with special reference to non-traditional forms of study. In O.E.C.D. *Learning opportunities for adults. Vol III. The non-participation issue*. Paris: O.E.C.D., 8-34.
- Hoyer, W., Cerella, J., & Onyper, S. (2003). Item learning in cognitive skill training: Effects of item difficulty. *Memory & Cognition 31*(8), 1260-1270.
- Jameson, M. & Fusco, B. (2014). Math anxiety, math self-concept, and math self-efficacy in adult learners compared to traditional undergraduate students. *Adult Education Quarterly, 64*(4), 306-322.
- Kaufmann, L., Pixner, S., & Göbel, S. (2011). Finger usage and arithmetic in adults with math difficulties: evidence from a case report. *Frontiers in Psychology, 2*, 1-3.
- Lam, Y. & Wong, A. (1974). Attendance regularity of adult learners: An examination of content and structural factors. *Adult Education, 24*(2), 130-142.
- Lethbridge, D. (1989). Motivational orientations of registered nurse baccalaureate students in rural New England. *Journal of Nursing Education, 28*(5), 203-209.

- Loong, E. (2011). Web-based mathematics: Some 'dos' and 'don'ts'. *The Australian Mathematics Teacher*, 67(3), 15-23.
- MacKeracher, D. (2009). Social change in historical perspective. *New Directions for Adult and Continuing Education*, 124, 25-35.
- Maloy, R., Edwards, S., & Anderson, G. (2010). Teaching math problem solving using a web-based tutoring system, learning games, and students' writing. *Journal of STEM Education: Innovations and Research*, 11(1), 82-90.
- May, D. (2009). Mathematics self-efficacy and anxiety questionnaire. *International Academic Research Journal of Social Science*, 3(1), 109-114.
- Mazzocco, M. (2005). Challenges in identifying target skills for math disability screening and intervention. *Journal of Learning Disabilities*, 38(4), 318-323.
- Massingham, P. & Herrington, T. (2006). Does attendance matter? An examination of student attitudes, participation, performance and attendance. *Journal of Teaching and Learning Practice*, 3(2), 80-103.
- McIlroy, A. (2010). *Adult math anxiety adds up to trouble with basic counting*. Retrieved from the Globe and Mail's website at <https://www.theglobeandmail.com/life/health-and-fitness/adult-math-anxiety-adds-up-to-trouble-with-basic-counting/article4306727/>
- McLeod, D. B. (1992). Research on affect in mathematics education: A reconceptualization. In Grouws, D. A. (Ed.), *Handbook of research on mathematics teaching and learning*, (pp. 575-596). New York, NY: Macmillan.
- Mellard, D., Krieshok, T., Fall, E., & Woods, K. (2013). Dispositional factors affecting motivation during learning in adult basic and secondary education programs. *Reading and writing*, 26(4), 515-538.
- Messenger, C., Emerson, J., & Bird, R. (2007). Dyscalculia in Harrow. *Mathematics Teaching Incorporating Micromath*, 204, 37-39.

- Metcalfe, A. & Campbell, J. (2011). Adults' strategies for simple addition and multiplication: Verbal self-reports and the operand recognition program. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 37(3), 661-672.
- Mezirow, J. (1981). A critical theory of adult learning and education. *Adult Education*, 32(1), 3-24.
- Middleton, M., & Midgley, C. (1997). Avoiding the demonstration of lack of ability: An under-explored aspect of goal theory. *Journal of Educational Psychology*, 89(4), 710-718.
- Mighton, J. (2013). For the love of math. *Scientific American Mind*, 24(4), 60-67. doi: 10.1038/scientificamericanmind0913-60
- National Research Council. (2012). Motivation, engagement, and persistence. In A. Lesgold & M. Welch-Ross (Eds.), *Improving adult literacy instruction: Options for practice and research* (pp. 130-161). Washington, DC: The National Academies Press.
- Nova Scotia Department of Labour and Advanced Education. Adult Education. Skills and Learning Branch. (2014). *Nova Scotia School for Adult Learning Statistical Report 2013 2014*. Retrieved from the NSSAL website: <http://gonssal.ca/General-Public/Documents-Resources/documents/StatsticalReport2013-2014-Final.pdf>
- NSSAL. (2010). *Program guide for the Nova Scotia High School Graduation Diploma for Adults*. Retrieved from the Nova Scotia School for Adult Learning. Nova Scotia.
- Oluoch, P. A. (2005). Low participation in adult literacy classes: Reasons behind it. *Adult Education and Development*, 65, 7-17.
- Pascopella, A. (2007). The dropout crisis. *District Administration*. 43(1), 30-36.
- Patton, J., Cronin, M., & Bassett, D. (1998). Math literacy: The real-life demands of adulthood. In S. Vogel & S. Reder (Eds.), *Learning Disabilities, Literacy, and Adult Education* (pp. 237-252). Baltimore: Paul H. Brookes.

- Phillips, C. (2010). Incentives and factors that affect student attendance. *Novus Scientia*, 1(2). Retrieved from Valdosta State University at <http://www.valdosta.edu/novusscientia/CPhillipsJournal.doc>
- Pickard, A. (2013). Attrition happens: Towards an acknowledgement and accommodation perspective of adult literacy student dropout. *Journal of research and practice for adult literacy, secondary, and basic education* 2(2), 114-126
- Pilmer, D. (2007). *Mental Math*. Adult Education Division. Retrieved from NSSAL website: <http://www.gonssal.ca/documents/MentalMath.pdf>
- Pimm, D. (1995). *Symbols and Meanings in School Mathematics*. New York: Routledge.
- Porter, K., Cuban, S., & Comings, J. (2005). *“One day I will make it”: A study of adult student persistence in library literacy programs*. New York: Manpower Demonstration Resource Center.
- Quigley, B. A. (1992). Looking back in anger: The influence of schooling on illiterate adults. *Journal of Education*, 174, 104-121.
- Quigley, B. (1997). *Rethinking literacy education: The critical need for practice-based change*. San Francisco: Jossey-Bass.
- Raymond, M. (2008). *Paying for A's: An early exploration of student reward and incentive programs in charter schools*. Retrieved from Stanford University at http://credo.stanford.edu/downloads/Incentives_Paper.pdf
- Reder, S. (2010). Participation, life events and the perception of basic skills improvement. In J. Derrick, J. Field, P. Lavender, S. Meyer, U. Howard, & T. Schuller (Eds.), *Remaking Adult Learning: Essays on Adult Education in Honour of Alan Tuckett*, London: Institute of Education.
- Reder, S. (2012). *The longitudinal study of adult learning: Challenging assumptions*. Research brief, The Centre for Literacy. Office of Literacy and Essential Skills. Canada.

Richardson, F. & Suinn, R. (1972). The mathematics anxiety rating scale: Psychometric data. *Journal of Counseling Psychology, 19*, 551-554.

Saah, A. & Mensah, J. (2013). Application of internal factors of urbanite female learner's participation in mass literacy programme for community based on learning and outreach models. *Educational research and reviews, 8*(12), 857-865.

Schalge, S. & Soga, K. (2008). "Then I stop coming to school": Understanding absenteeism in an adult English as a second language program. *Adult Basic Education and Literacy Journal, 2*(3), 151-161.

Schofield, D. (2011, May). *Keeping students connected: How teachers can help students feel good about school... and why it matters*. [PowerPoint slides]. Presented at the Atlantic Conference on Learning Disabilities, Halifax, Nova Scotia.

Simmons, R. & Singleton, C. (2006). The mental and written arithmetic abilities of adults with dyslexia. *Dyslexia, 12*, 96-114.

Statistics Canada. 2003. *Building on our Competencies: Canadian Results of the International Adult Literacy and Skills Survey*. Catalogue no. 89-617-X1E. Ottawa.

Statistics Canada. 2015. *Individuals by total income level, by province and territory (Canada)*. Table no. 111-0008. Ottawa. Retrieved from: <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/famil105a-eng.htm>

Steinberg, L. D., Brown, B. B., & Dornbush, S. M. (1996). *Beyond the classroom: Why school reform has failed and what parents need to do*. New York: Simon and Schuster.

Tapia, M. & Marsh, G. (2004). An instrument to measure mathematics attitudes. *Academic Exchange Quarterly, 8*(2), 16-21.

Terry, M. (2001). Philosophies of adult education movements in 20th century Canada: Implications for current literacy educators. *The Canadian Journal for the Study of Adult Education, 15*(2), 61-78.

- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago, IL: The University of Chicago Press.
- Wadsworth, L. M., Husman, J., Duggan, M. A., & Pennington, M. N. (2007). Online mathematics achievement: Effects of learning strategies and self-efficacy. *Journal of Developmental Education, 30*(3), 6-14.
- Walter, P. (2003). Literacy, imagined nations, and imperialism: Frontier College and the construction of British Canada, 1899-1933. *Adult Education Quarterly, 54*(1), 42-58.
- Wigfield, A., & Eccles, J. (1992). The development of achievement task values: A theoretical analysis. *Developmental Review, 12*, 265-310.
- Zavarella, C. A., & Ignash, J. M. (2009). Instructional delivery in developmental mathematics: Impact on retention. *Journal of Developmental Education, 32*(3), 2-13.
- Zawaiza, T. & Gerber, M. (1993). Effects of explicit instruction on math word-problem solving by community college students with learning disabilities. *Learning Disability Quarterly, 16*, 64-79.
- Ziegler, M., Ebert, O., & Cope, G. (2004). Using cash incentives to encourage progress of welfare recipients in adult basic education. *Adult Basic Education, 14*(1), 18-31.
- Zhang, D., Katsiyannis, A., Barrett, D., & Willson, V. (2007). Truancy offenders in the Juvenile Justice System: Examinations of first and second referrals. *Remedial and Special Education, 28*, 244-256.

Appendix A
Survey Study
Survey Questionnaire

I understand and consent to participate in this survey study: YES NO

For the following two statements, please show whether you:

strongly agree	agree	agree somewhat	disagree somewhat	disagree	strongly disagree
----------------	-------	----------------	-------------------	----------	-------------------

I am comfortable using a computer and the Internet.

I have not completed my education because life got in the way.

Male	Female	Transgender
Gender: <input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18-22	23-29	30-45	46-60	60+
Age: <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

None	1	2	3	4 or more
Number of Dependents: <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Aboriginal	Canadian	African-canadian	International	Other:
Cultural background: <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="text"/>

Less than Grade 5	Completed Grade 6, 7, or 8	Completed Grade 9, 10, or 11	High-School Diploma	Diploma on IPP	Other:
Highest level of education: <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

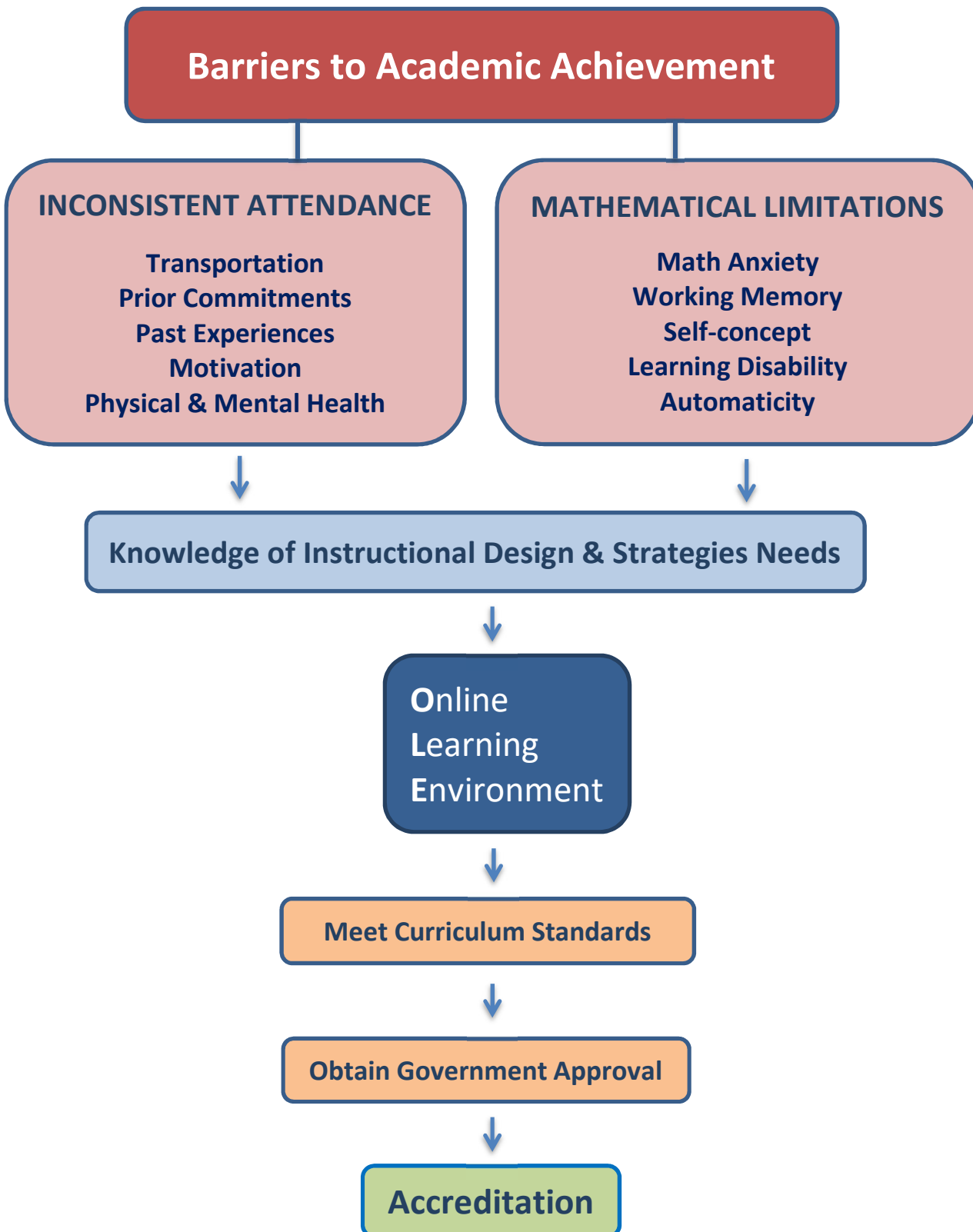
Yes Full-time	Yes Part-time	Yes Self-employed	Yes Other:	No
Are you currently employed? <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

under \$5,000	\$5,000 to \$15,000	\$15,000 to \$25,000	\$25,000 to \$35,000	\$35,000 to \$50,000	\$50,000+
Individual yearly income: <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Yes, E.I.	Yes, D.C.S.	Yes, other:	No
Are you on income assistance? <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix B
Conceptual Framework

Behind the Barriers



Appendix C Participant Consent

Text to be used in outgoing email:

Good day,

André would like to take this opportunity to invite you to participate in a research study being conducted as a part of his thesis for his Master in Education. This has not been written to you from the math instructor for the Cunard Learning Centre – a position that André held for many years. Rather, he is writing to you as a university student in search of answers to challenges faced by adult learners that have been observed over the years. André would like to see adult programs use strategies to help learners overcome these challenges, and you can help make a difference. Please consider taking the time to participate in this study. Everything you need to do can be done online in less than half of an hour. The link following the enclosed consent form will grant you access to the online survey.

Thank you in advance for your consideration and have a pleasant summer.

The Cunard Learning Centre
A MetroWorks program

Participant Consent Form

Introduction & Purpose

My name is André Davey. As a graduate student at Mount Saint Vincent University, I am working with my thesis supervisor, Dr. Eva Knoll in the Faculty of Education. I would like to invite you to take part in my research study. The reason for this study is to look behind two common challenges that you may have encountered. These challenges have been identified as: keeping up with attendance and struggling with math. If we can understand the influences behind these barriers, we can help you overcome them.

Recruitment

You are invited to join in this study because you were in an adult learning program between 2011 and 2015. Only learners with a working email account are contacted. There should be no conflict of interest. Our professional relationship has come to an end. I am no longer the full-time math instructor for the Cunard Learning Centre.

Requirements of Participants

You are being asked to complete an on-line survey. There are three parts to the survey: a personal information form and two questionnaires. Each questionnaire asks you how much each statement applies to you. The survey should take about 20 minutes to complete. The enclosed link will direct you to the online survey. Completion and submission of the survey indicates that you give consent to have your answers used in the study. Participation in the study also shows your consent to access your attendance records.

Risks & Benefits

Anticipated risks might include a feeling of anxiety when filling out the survey and the accuracy of the data as your answers may ask you to remember how you felt up to five years ago. You may feel nervous using a computer. You may also feel awkward commenting on your math skills or attendance. Your honesty is appreciated. It is understood that we cannot always remember our feelings with 100% accuracy. There are few risks and they are thought to be no more than someone would meet in everyday life.

There is no direct benefit to you for taking part in the survey. I hope that the research sheds light on barriers faced by adult learners. The planned solution to help with these barriers is to offer the same course work online. The data from this research will help inform our knowledge about this topic and the best teaching methods to use when creating an online environment for adult learners.

Data

This survey uses Lime Survey. It is an online survey application. All answers will be kept securely on a server. This is in the Mount Saint Vincent University data centre in Halifax, Nova Scotia. To protect your information, data will be kept on a computer that can only be accessed with a password. Information could also be kept on an encrypted USB flash drive. When the study is done, the flash drive will be erased by the university's computer department.

The data may be shared with the supervisor and thesis committee in seeking advice. Any future publications will include collective information. Your individual responses will not be shared with anyone. When the research is completed, I will keep the data for up to 5 years after the study is over.

Privacy

To protect your privacy, the survey is anonymous. Information will not be collected that will easily identify you. Although your IP address can be tracked through the survey software, I will not be collecting this information. Your IP address may be used only to make sure that one person is not completing the survey multiple times. Although I know who is being recruited, I will not know who chooses to complete the survey. Any personal information will be kept confidential.

Right to withdraw

Please note that participation is voluntary. Taking part in the survey may make you uncomfortable or upset. You may simply wish not to answer some parts. You are free to decline to answer any questions you do not wish to answer. To stop participating at any time, close your internet window. Information will not be saved if you close the survey before getting to the end of it. This will void your consent to participate in the study.

Taking part in research is voluntary. You can withdraw your consent at any point before submitting the survey. However, because the survey is anonymous, once you click to submit at the end of the survey, the researcher cannot determine which answers belong to you. Therefore, your information cannot be withdrawn after that point.

Please note that by agreeing to participate you are not giving up any of your legal rights as a research participant.

Transfer of Knowledge

Information from this study may be used in articles or for presentations. Results could be shared with four different groups. They are: adult instructors; the learning centre that you attended; the Nova Scotia Department of Labour and Advanced Education; and the participants themselves. Participants will not be directly identified. Please send an email to the researcher if you would like to view the results of this study. A report will be available by request until December 31, 2016.

REB Clearance

The University Research Ethics Board has reviewed this research study. They have found it to satisfy Mount Saint Vincent University's Research Ethics Policy.

Contact Information

If you have any questions about this research, please feel free to contact the researcher.

Researcher: André Davey, 902-453-6246 ext. 136, andre.davey@msvu.ca

Advisor: Dr. Eva Knoll, 902-457-6504, eva.knoll@msvu.ca

You may have questions about how this study is being done. You may also like to speak with someone not directly involved in the study. Please note that you can contact Brenda Gagné, the Research Ethics Coordinator.

Phone number: 902-457-6350

Email: research@msvu.ca

Appendix D
Consent to Obtain Information
(to be printed on University letterhead)

I, Dave Rideout (CEO) hereby authorize the Cunard Learning Centre, a MetroWorks program, to release from our student files aggregated data from our attendance records for the students who attended from 2011 to 2015.

I give permission for this information to be used for the purpose of a descriptive record for the completion of a Master of Education thesis at Mount Saint Vincent University.

Approximately 200 records will be reviewed by administrative staff for the purpose of retrieving attendance records and an email address for communication purposes. The information will be obtained through access to students' digital files on the Cunard Learning Centre's administration computer. To protect the participant's privacy, the data will be de-identified so that their attendance record is reduced to only a numerical value for the researcher.

The time period during which the information will be extracted will be September 2016. The time range over which the information in the records was collected will have been between 2011 and 2015 to include students who attended Level II or Level III of the Cunard Learning Centre.

I understand that my authorization will remain effective from the date of my signature until October 31st, 2016, and that the information will be handled confidentially in compliance with the Research Ethics Board of Mount Saint Vincent University.

Data collected has the potential to be correlated with the demographic data to provide a clearer perspective of the adult learner's rationale of choices and reasons behind the barriers of attendance and math achievement. The data gained may be used in subsequent studies, in publications and in presentations. A summary of the record review results will be made available to the organization from which the information was drawn.

I understand that I may see the information that is to be used, and that I may revoke the authorization at any time by written, dated communication.

I have read and understand the nature of this release.

Signature of CEO of learning organization

Date

Signature of researcher

Date