

# ***The Impact of Experiential Learning Programs on Student Success***

prepared by

***Canadian Council on Learning***

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## Executive Summary

### *Background*

Ontario is currently making visible efforts to increase academic standards, improve secondary school success for all students, and raise the provincial secondary graduation rate to 85% by 2010-2011. Reforms have led to important changes in the secondary school system, such as the creation of Specialist High Skills Majors and expanded cooperative education, providing students with valuable experiential learning opportunities that help prepare them for life after high school. Experiential learning complements students' academic learning and provides youth with experiences and knowledge that maximize their growth and development while meeting their needs for career exploration. CCL was contracted by the Ontario Ministry of Education to undertake a systematic rapid evidence assessment (SREA) of the research literature devoted to examining the effects of experiential learning (EL) programs on student success.

The main research question governing this SREA is: *What do we know about the impact of experiential learning on student achievement, secondary school graduation, and their preparation for their future post-secondary pathways?* Additional questions addressed include: (a) *What types of EL programs are available for high school students?* (b) *What are the outcomes of EL programs?* (c) *What factors facilitate or impede EL?* (d) *What is the quality of the research studies on EL?*

### *Method and Assessment*

The total number of studies captured for this review was 514. While 298 studies progressed to the second phase of screening, 113 met the required criteria for inclusion in the keywording stage. Keywording guidelines were developed to organize and compare the results of the studies. After applying these guidelines, 35 studies were eligible for final analysis. The report includes a chapter devoted to mapping the literature. The map provides a general break down of the various characteristics of the body of literature as elicited through the keywording stage of the review and supplies the reader with distinctive features of the literature before moving on to the next stage of in-depth descriptions and quality assessment.

The quality assessment rubric includes 16 questions, or guidelines. A binary scale was applied to each guideline, 1 point for meeting the criteria, 0 for not meeting it. Overall scores were grouped into three levels of quality: "High quality" for those studies scoring above 13 points (80% of full score), "Medium quality" for those with a score from 10 to 12, and "Low quality" for those scoring 9 or below (60% of full score). Of the 35 studies, seven were assessed as being of high quality, 15 were medium, and 13 were considered low quality.

### *Results*

The studies reviewed for this report varied on program type, measurement tools, outcomes and quality. Regardless of program type or the quality of the study, when career awareness was used as a measure of career preparation, all results were

positive. Although tempered by the variation in the quality of the research, outcomes for indicators of graduation were also positive with all studies in this category indicating that EL programs have positive effects on retention and drop-out rates. The findings suggest that high school students who experienced any type of EL program demonstrate psycho-social benefits in terms of self-esteem, engagement in workplaces or schools, socialization and leadership, and motivation.

Nevertheless, the evidence of the impact of experiential learning on academic achievement (defined in the literature as grades, grade point average, standardized scores, and various other measures) is inconclusive. Four studies reported positive outcomes. However, two of these studies were rated as being of low quality. Moreover, of the four studies reporting no impact on academic success, two are of medium quality and two are of high quality. Nonetheless, based on the findings presented here, it is reasonable to conclude that EL programs do not appear to have a *negative* impact on student academic success. It is likely that moderator variables, such as prior academic achievement or the type of outcome measure (GPA versus test scores, etc.), have an effect on overall results.

In general, employers were happy to participate in EL programs, and enjoyed the sense of community commitment. They enjoyed being able to support young people in their preparation for the workforce, and they found having exposure to possible future employees beneficial. Still, there were a number of concerns raised by employers.

#### *Conclusion and Discussion*

Time and resource restrictions did not permit a complete and comprehensive review of the topic. Still, CCL was able to capture and screen over 500 articles, eventually narrowing the list to 35 studies for coding and analysis. These studies were diverse and heterogeneous, often limiting the depth of synthesis available. Other limitations include the variation in quality of the studies and the small number of overall studies focussing on any one outcome, such as academic achievement or graduation. Still, the report provides a discussion of findings that were amendable to synthesis and includes the follow list of further considerations:

- EL programs that seek to prepare young people for life after high school are beneficial for students and for employers;
- Placement for placement's sake is not advisable;
- Inappropriate placements hinder the interest of young people; possibly discouraging them from further engagement in the community and in the workforce;
- A dedicated coordinator who oversees all aspects of the program is fundamental to the success of these programs;
- A successful work experience placement must achieve a balance between the contribution that the students' make to the business in which they are engaged and the learning opportunities for the students;
- Students must be well prepared.

## 1.0 Background and Context

Ontario is currently making visible efforts to increase academic standards, improve secondary school success for all students, and raise the provincial secondary graduation rate to 85% by 2010-2011. The Ministry of Education is transforming and modernizing secondary schools to provide students with more opportunities for high quality and relevant learning experiences that build on their personal strengths and interests.

The Student Success/Learning to 18 Strategy is part of a large-scale reform of the secondary school system in Ontario and is designed to ensure that every student is provided with the tools to successfully complete their secondary schooling and reach their post-secondary goals, whether these goals involve apprenticeships, college, university, or the workplace. The reforms have led to important changes in the secondary school system, such as the creation of Specialist High Skills Majors and expanded cooperative education, providing students with valuable experiential learning opportunities that help prepare them for life after high school.<sup>1</sup>

Canadian employers face a growing need for highly skilled personnel in response to the demands of an emerging knowledge economy. High school students in Canada are among the most highly educated young people in the world, but coursework alone may not provide youth with the skills necessary to make a successful school-to-work transition. Experiential learning complements students' academic learning and provides youth with experiences and knowledge that maximize their growth and development while meeting their needs for career exploration. Examples of such programs include cooperative education, internships, job shadowing, job twinning, work experience and virtual work experience, school-to-work transition programs, and many other work placements.

Experiential learning is not a new curricular feature. Interest in the benefits of experiential learning programs has in fact been evident for quite some time. In the 1970s, researchers in the USA began to examine the effects of career education on academic achievement. Ten learner outcomes established by the Office of Career Education of the U.S. Department of Health, Education, and Welfare guided this research movement, and proliferation of work in the field resulted that looks at the potential benefits of experiential learning on student outcomes (Hoyt, 1980).

### 1.1 The Task

CCL was contracted by the Ontario Ministry of Education to undertake a systematic rapid evidence assessment (SREA) of the research literature devoted to examining the effects of experiential learning (EL) programs on student success. The report consists of five chapters. The present chapter includes a section dedicated to providing background and context about EL programs, and provides a brief

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<sup>1</sup> For more information see on this topic see: Canadian Council on Learning (2008). Evaluation of the Ontario Ministry of Education's Student Success / Learning to 18 Strategy: Final Report. 198 pages. [http://www.ccl-cca.ca/pdfs/OtherReports/StudentSuccessStage2Report\\_Oct\\_15\\_2008.pdf](http://www.ccl-cca.ca/pdfs/OtherReports/StudentSuccessStage2Report_Oct_15_2008.pdf)

description of EL programs and other key terms used throughout the review. It also outlined the principal review questions. Chapter 2 describes the SREA methodology and documents the flow of studies as they progress through the various stages of the review process. Chapter 3 is devoted to mapping the results of the keywording stage and describes, using tables and graphs, key characteristics of the 35 studies that met all the criteria for final inclusion. This chapter also provides the reader with a brief description and quality assessment of each of the 35 studies. Chapter 4 contains the results of the review. Here, coding results are synthesized and analyzed with a view to answering key guiding questions presented in the original RFP. The final chapter summarizes the findings of the review, makes concluding statements based on the research evidence, and offers suggestions for supporting EL programs.

### **Past Research**

Hoyt (1980) and Bonnet (1977) found evidence for a positive impact of career education on academic achievement, while a number of studies investigating the effectiveness of incorporating career guidance into the academic curriculum found positive outcomes for students (Hughes, Lapan & Gysbers, 1993; Lapan, Gysbers, Hughey, & Arni, 1993). Other authors concluded that enrolment in career and technical education (CTE) programs lowered dropout rates and increased the retention of students in high school (Bishop, 1987; Brown, 1998), while a 1993 study by Hughey et al. concluded that career guidance impacted students' overall knowledge and understanding of career decision making process and career planning process. Vocational education provides high school students with valuable labour market payoffs and raises employment rates and earnings for at-risk youth (Brown, 1999).

Existing meta-analyses examining the overall effect of career exploration interventions have discovered a number of small but positive effects on student outcomes. Whiston, Sexton, and Lasoff (1998) meta-analyzed the effects of career counselling for high school youth and found small overall effect sizes. They further noted that while individualized career counselling appeared to be the most effective and efficient, computerized interventions were the most cost-effective. Evans and Burck (1992) conducted a meta-analysis using 67 studies that examined the impact of career education on academic achievement. They too found small positive overall effects, and noted that larger effects when studies were grouped by subject matter, ability and grade level. Baker and Taylor (1998) also claimed their meta-analysis of the effects of career education interventions produced a positive, small to medium overall effect; however it is unclear what their outcomes were for measuring the effects of programs - raising many questions about the rigorousness and quality of their study.

Findings suggest positive relationships between career education and various student outcomes, and the interest in such programs has remained strong over the course of four decades. Recently, King (2005) noted that schools are failing to provide students with courses designed to their needs, strengths and ambitions. He also stressed that "all students should have access to courses that will prepare them for their future" (p.23). The purpose of this review is to uncover what the research

evidence says about the impact of experiential learning on students' achievement, secondary school graduation and their preparation for future post-secondary pathways.

### Review Questions

Although experiential learning opportunities have always enhanced school programs, the Ministry is interested in: (1) reviewing the existing research devoted to experiential learning and its effects on students; and (2) gaining insight into the factors that facilitate or impede participation in such programs for employers. In order to do this, the Canadian Council on Learning (CCL) conducted an SREA of the literature published between the years 1999 and 2008. The main research question governing this SREA is as follows:

*What do we know about the impact of experiential learning on student achievement, secondary school graduation, and their preparation for their future post-secondary pathways?*

Other questions also addressed in this SREA include:

- (a) *What types of EL programs are available for high school students?*
- (b) *What are the outcomes of EL programs?*
- (c) *What factors facilitate or impede EL?*
- (d) *What is the quality of the research studies on EL?*

### 1.2 Operational Definitions of Key Terms

Most of the definitions for EL programs are taken directly from the Ontario Ministry of Education's (2000) *Cooperative Education and Other Forms of Experiential Learning: A policy and procedures document for secondary schools*. Due to time and resource limitations, it was necessary to utilize the ministry's own program names and definitions in order to ensure the review focuses and reflects Ontario's experience and needs in the most efficient manner.

There are a number of factors to consider with regard to these terms and definitions. Since there is no consistent definition for experiential learning, nor are the definitions for the various types of EL programs uniform across studies, not all programs fit perfectly into one of these established types. Moreover, minimal research included in this review originates from Canada, let alone Ontario. The majority of research reviewed here was conducted in the USA and relied on terms and definitions germane to programs that exist there. Furthermore, many authors did not provide a clear description of the programs and interventions being evaluated. In fact, it was often the case that studies did not provide *any* detailed descriptions of the program(s) being evaluated. Thus, where one study referred to an intervention as an apprenticeship program, another may refer to the same set of activities as a cooperative program or as Career and Technical education (CTE). Consequently, and when possible, reviewers applied the criteria provided in the definitions from the Ontario 2000 document to the existing information presented within a given study.

The following definitions are those provided within the Ministry's *Cooperative Education and Other Forms of Experiential Learning* document.

**Experiential Learning (EL)** consists of planned learning experiences that take place in the community, and provide students who are enrolled in courses of all types and in all disciplines with the opportunity to enhance their school programs. Experiential learning can assist all students, including exceptional students, who are bound for university, college, apprenticeship, or the workplace, in making career decisions as well as in developing the knowledge, skills, and attitudes that are essential in today's society. All forms of experiential learning are a valuable complement to students' academic experience and preparation for the future. When organized in a sequential fashion that meets career development needs, experiential learning can maximize student growth and development, and should be encouraged.

**Work Experience** is a planned learning opportunity, within any credit course, that provides students with relatively brief work experiences, usually of one or two weeks' duration and not exceeding four weeks. Some authors used this term to refer to work experience in and out of schools, including paid work. For example, Teitelbaum (2002) looked at the "hours worked in high school by non-college-bound students" and reported the outcomes as work experience.

**Virtual Work Experience** enables young people to explore workplaces, jobs, and work tasks using simulated workplaces. Virtual work experience should not be viewed as a substitute for an actual placement. Instead, the aim of virtual work experience should be to complement and supplement actual work experience that currently takes place in school. Many young people are apprehensive when they begin their actual placement as they are often entering an unknown situation. By accessing the virtual tour prior to starting an actual placement (if available), young people have an opportunity to develop an understanding of what would actually be expected of them during an actual work experience .

**Job Shadowing** allows one-on-one observation of a worker at a place of employment. Job shadowing is a work experience option where students learn about a job by walking through the work day as a shadow to a competent worker. The job shadowing work experience is a temporary, unpaid exposure to the workplace in an occupational area of interest to the student. Students witness firsthand the work environment, relevant employability and occupational skills in practice, the value of professional training, and potential career options. Job shadowing is designed to increase career awareness, help model student behaviour through examples, and reinforce in the student the link between classroom learning and work requirements.

**Job twinning** provides the student with an opportunity to accompany a cooperative education student to his or her placement for one-half to one day. Focusing specifically on the essential skills in the workplace helps students to understand and value the transferability of their skills from school to work, job to job and sector to sector.



Job shadowing and job twinning normally involve only one-half to one school day and have no credit value independent of the course within which they are undertaken. They allow to be integrated into any credit course and may also be components of a student's school-to-work transition program.

**School-to-Work Transition** programs are programs that provide ways for students to transition successfully into the economy, either through paid employment with a business or self-employment. School-to-work transition programs integrate the academic and vocational education, link schooling with the demands and realities of the workplace, and coordinate secondary and post-secondary education with employers.

**Apprenticeship** programs are paid, work-based training combined with post-secondary education. Apprentices spend approximately 80% of their time learning their skills on the job (under the direction of a highly skilled journey person) and approximately 20% of their time learning in a classroom setting. Apprenticeship programs can range from three to five years in length at most, but some could run for four years. At the end of the program, students generally take a completion exam in order to acquire an apprenticeship certificate. Once apprentices receive their certificate, they can often begin to work at regular salaries.

**Cooperative education** programs include coursework and a work experience placement. Both are designed to suit the student's strengths, interests, and needs and to enhance the student's preparation for the future. Students earn cooperative education credits by integrating classroom theory with planned learning experiences in the community to achieve learning based on the curriculum expectations of the related course. Students are provided with opportunities to apply and extend the knowledge, to practice and refine the skills acquired in related courses, and to demonstrate achievement of placement expectations that reflect current workplace practices and standards.

Cooperative education involves a partnership between education and business, industry, agriculture, labour, or community organizations that includes students, teachers, parents, employers, and placement supervisors. Additional participants may be involved in the case of exceptional students and other students with special needs. Joint planning by these individuals ensures that students are provided with a systematic introduction to career exploration, experiential learning, and career planning.

#### **Composite/combination of experiential learning (EL) programs**

This category was developed in recognition of the fact that many of the studies included in this review investigated more than one type of EL program but reported their results for EL programs in general (i.e. results were not presented for the effects of the individual programs, rather they were presented results for EL programs as a composite). Nineteen of 35 studies used this approach and were thus classified as "Composite EL programs".

## 2.0 Methods

This chapter details the methods of this Systematic Rapid Evidence Assessment (SREA). It describes the step-by-step procedures undertaken for this research, beginning with a description of database and hand-search strategies, moving onto an explanation of the screening and retrieval stages, and ending with the coding and analysis stages.

### 2.1 Search Strategies

The review team performed comprehensive searches to collect studies relevant to the research question. The searches were conducted through four different approaches. As illustrated in Figure 1 at the end of this chapter, and once duplicates had been removed, the major electronic database search resulted in locating 445 publications. An additional website search for fugitive/grey literature located 42 studies, and 27 studies were collected during the pre-search and hand-search process. A total of 514 studies were collected for this review.

#### 2.1.1 Pre-search Process

Reviewers performed a preliminary internet search using simple keywords to gather background information. The webpages or reports searched and reviewed at this stage included provincial and ministry level government websites in Canada and the U.S., as well as school district and individual school website. Based on the pre-searched information, the review team identified key concepts and definitions for use in the larger database search. Twenty-one publications were collected and included as hand-search material during this stage of the review.

#### 2.1.2 Electronic Database Search

The search strategy was structured broadly to maximize the capture of articles. It was constructed by extracting applicable terms from the research question and by querying the thesaurus and subject heading functions in the selected electronic databases. Using the grouped terms (see table 2.1) as a starting point, final search strategies were developed to maximize the retrieval potential in each of the subject specific databases. Relevant terms were compiled and categorized under three headings: population, program/intervention, and outcomes.

Table 2.0 lists the terms used to construct the search strategies for the electronic databases. The corresponding databases' specific controlled vocabulary<sup>2</sup> for these terms were gathered and used to construct a final search strategy in each of the following databases: Academic Search Complete (ASC, via EBSCO), CBCA Education (via EBSCO), Education Index Full Text (via EBSCO), Education Resources Information Center (ERIC, via EBSCO), Education Index Full Text (via HW Wilson Web), and EconLit (via EBSCO). Due to time and resource restrictions, a date restriction of 1999-2008 was used to limit the capture of citations for review. Four hundred and forty-five publications were retrieved from these searchers.

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<sup>2</sup> Controlled vocabulary are database specific search terms located within the thesaurus of each database. These terms are used to identify key concepts for each study during the cataloguing process. Each database has its own set of controlled vocabulary.

**Table 2.0 Search Terms**

Population	Program/Intervention	Outcomes
School students Secondary students High schools High school students Middle school students Junior high students Adolescents/pre-adolescents Youth Teenagers Full-time students/fulltime students Ages 13-21	Active learning Apprenticeships apprenticeship programs experiential learning hands-on learning career programs career education career exploration context-based learning cooperative programs cooperative education cooperative learning job shadowing mentoring field experience programs practicum AND secondary education career programs internship student placement AND school-to-work transition program school work transition transitional programs service learning labour vocational learning vocational education workforce work and education work-study programs/work study programs	Academic achievement Educational attainment Outcomes of education Evaluation Student success Academic persistence Student retention Dropout prevention Graduation Graduate requirements Certification Curriculum effectiveness School-to-work transition Motivation Attitude Work attitudes Engagement Occupations Career preparation Employment rate Employment patterns Income Wage Salaries Income level Career pathways Technical or trades Program efficacy Program effectiveness Program evaluation

**2.1.3 Additional Search: Websites and Hand-searches**

Following the electronic database search, additional effort was made to capture fugitive literature, i.e. research not published in academic journals. Publications and webpages exhibiting sufficient indicators (titles, abstracts and key terms) for eligibility were assessed and retrieved from the research oriented websites. Table 2.1 lists those sites. A total of 42 publications were retrieved during this process. Last, hand-searching of key journals and reference lists produced a further 27 studies.

**Table 2.1 List of Websites for Fugitive Literature**

<a href="http://nces.ed.gov/">http://nces.ed.gov/</a> <a href="http://www.mprinc.com/products_and_publications/browse_by_subject.aspx?subjectID=30">http://www.mprinc.com/products and publications/browse by subject.aspx?subjectID=30</a> <a href="http://www.ccl-cca.ca">www.ccl-cca.ca</a> <a href="http://www.statcan.gc.ca">www.statcan.gc.ca</a> <a href="http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=60&amp;language=en-US">http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=60&amp;language=en-US</a> <a href="http://www.education.alberta.ca/">http://www.education.alberta.ca/</a> <a href="http://www.edu.gov.mb.ca/ecy/index.html">http://www.edu.gov.mb.ca/ecy/index.html</a>	<a href="http://www.gnb.ca/0000/index-e.asp">http://www.gnb.ca/0000/index-e.asp</a> <a href="http://www.ed.gov.nl.ca/edu/k12/k12.htm">http://www.ed.gov.nl.ca/edu/k12/k12.htm</a> <a href="http://www.ednet.ns.ca/">http://www.ednet.ns.ca/</a> <a href="http://www.edu.gov.on.ca/eng/">http://www.edu.gov.on.ca/eng/</a> <a href="http://www.gov.pe.ca/education/index.php3">http://www.gov.pe.ca/education/index.php3</a> <a href="http://www.mels.gouv.qc.ca/GR-PUB/m_englis.htm">http://www.mels.gouv.qc.ca/GR-PUB/m_englis.htm</a> <a href="http://www.education.gov.sk.ca/">http://www.education.gov.sk.ca/</a> <a href="http://www.gov.bc.ca/bced/index.html">http://www.gov.bc.ca/bced/index.html</a>
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## 2.2 Screening Processes

A total of 514 publications were imported into EPPI-Reviewer<sup>3</sup>, a web-based application designed for conducting and managing systematic reviews. Inclusion/exclusion criteria were applied during the first and second screening stages. Keywording guidelines were developed after the screening processes. Based on the grouping of keywording results, coding guidelines were developed to flesh out the results with detailed sample and program information. The final result coding was performed using Excel.

### 2.2.1 Inclusion/Exclusion criteria

The Inclusion/exclusion criteria were based on five categories. Below is an abridged version of the criteria used to screen publications.

#### Population Criteria

- students who were between grades 9 and 12 (inclusive; or ages 13-21yrs) participated in an experiential learning program;
- a study that include students who were outside that age range may have been included *IF* it was evaluating the impact of an EL program in which the students were enrolled during grades 9-12;
- if a study reported on parents' or employers' views of experiential learning, the youth to which they were referring were to have been in grades 9-12; and
- only populations of Canada, USA, Britain, Australia, New Zealand were to be included.

#### Intervention Criteria

The learning program of focus was to have:

- been linked to the high school curriculum (i.e. to count towards graduation or the completion of a specific course, though not necessarily count as a specific "credit value");
- facilitated career preparation or career pathways.

<sup>3</sup> [http://eppi.ioe.ac.uk/cms/Portals/0/PDF%20reviews%20and%20summaries/EPPI-Reviewer\\_Feb\\_06.pdf](http://eppi.ioe.ac.uk/cms/Portals/0/PDF%20reviews%20and%20summaries/EPPI-Reviewer_Feb_06.pdf)

### **Setting Criteria**

- the students of focus must have been enrolled in a public school;
- Firm-based schools were not included.

### **Outcome Measure(s) Criteria**

The outcome measures of interest for this review were any identified facilitators or barriers for students to:

- (1) Student achievement/success  
such as ;
- (2) Graduation;
- (3) Career and PSE preparation

OR

Any barriers or facilitators identified by the parents of youth in grades 9-12 who were eligible for experiential learning;

OR

Any barriers or facilitators identified by employers who might have taken or took part in experiential learning programs for youth in grades 9-12.

### **Methodology Criteria**

Studies were to have evaluated the impact of an EL program on the outcomes outlined above.

Evaluation of impact entailed any one of the following:

- measurement of change,
- survey/questionnaire,
- interviews with students/parents/employers/teachers/administrators,
- Comparisons,
- Correlations,
- Reviews,
- Case studies, or
- Statistics Canada reports

Theoretical or purely descriptive articles, books or newspaper articles were not included.

### **2.2.2 First screening stage**

During the initial screening process, the criteria were applied to titles and abstracts only. Studies were included for second screening in cases where it was unclear whether the study met the inclusion criteria. To ensure that studies were not removed in error at this early stage, a second reviewer screened all those studies excluded by the first reviewer for reliability purposes. As a result, 298 studies were transferred to the second screening stage, leaving 216 studies excluded.

### **2.2.3 Second screening stage**

Second screening included reading each study in its entirety, indicating that all the studies that had progressed through the initial screening stage had to be retrieved in full-text format. Of the 298 studies, 34 were irretrievable within the time constraints of the review. Thus, 264 studies were screened and an additional 151 were excluded.

### **2.3 Keywording stage**

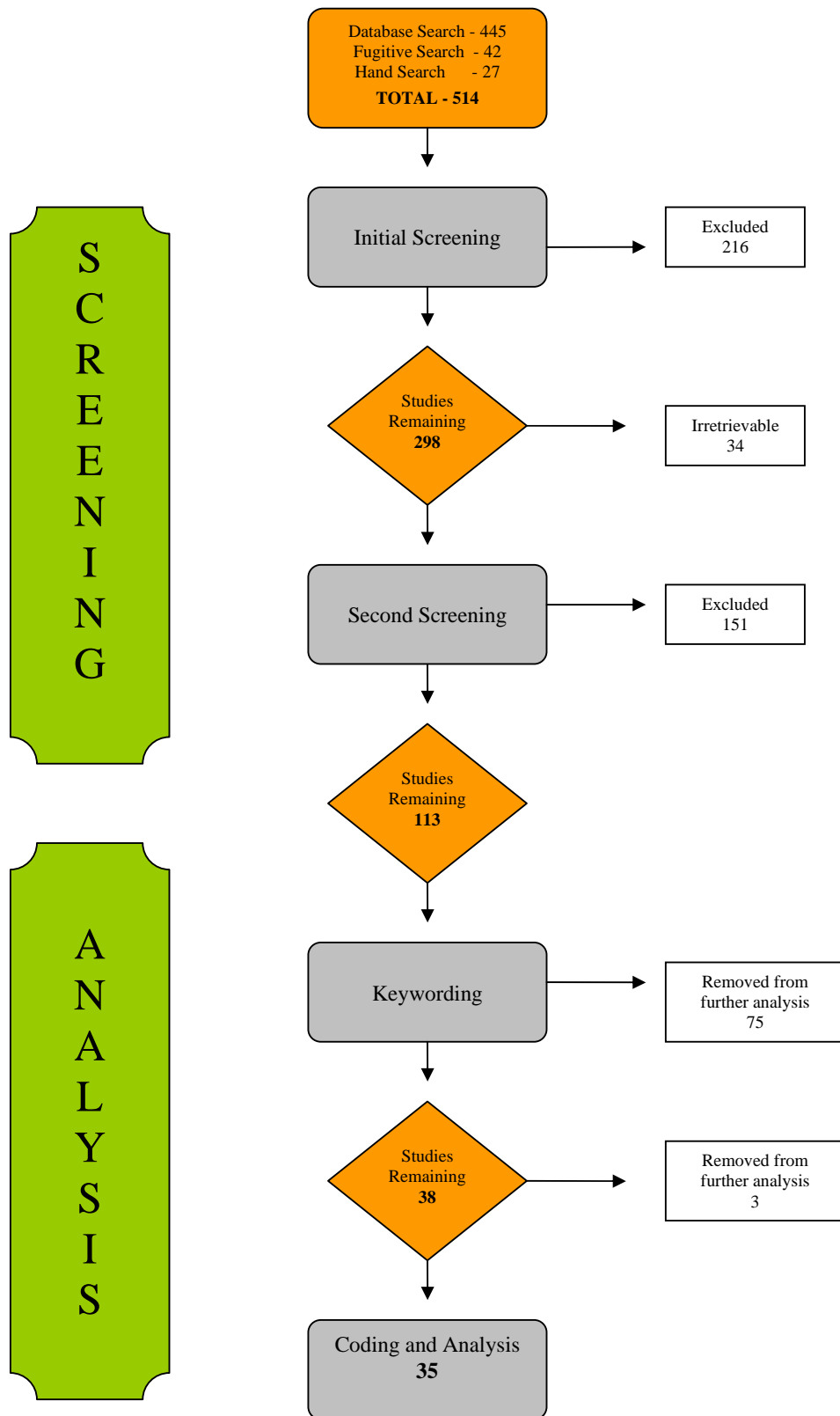
The keywording stage is designed to map the remaining body of literature, grouping it into conceptually similar content areas and identifying which studies are suitable for final coding and analysis. Keywording guidelines were developed to categorize studies in relation to the research questions.

The remaining 113 studies were keyworded, approximately 20% of which (n=24) were double-keyworded for reliability. During the keywording process, 75 studies were deemed unable, upon further examination, to answer the research questions developed for this review. The remaining sub-set of 38 studies progressed to the coding and analysis stage of the review.

### **2.4 Coding and Analysis Stage**

During the coding and analysis stage, an additional three studies were identified as not suitable for analysis and removed. As a result, 35 studies were coded and analyzed. Coding guidelines were focused on extracting more detailed information about EL programs, study samples, and outcomes. Coding reliability was conducted by the second reviewer during the assessment of results carry out during the analysis.

**Figure 2.0 FLOW OF LITERATURE THROUGH THE REVIEW**



### 3.0 Mapping and Description of the Studies

The first section of this chapter maps the literature according to key characteristics extracted during the keywording phase of the review. This provides the reader with a general overview of the content and attributes of the research. In order to best reflect Ontario's experience with EL programs, a list of potential program types and definitions was gathered from the *Cooperative Education and Other Forms of Experiential Learning: policies and procedures for Ontario Secondary Schools, 2000* report and used for categorizing programs (work experience; virtual work experience; job shadowing; job twinning; school-to-work transition; cooperative learning; and apprenticeship programs). An additional program type (composite EL program) was also created to identify those studies that aggregated various types of EL programs in an effort to make statements about experiential learning in general.

The second section provides a brief description of each of the 35 studies included for final analysis. These précis include information about the purpose of the study, the type of experiential program examined, the sample and the overall findings.

The third and final section of the chapter informs the reader about the quality of each study. A quality evaluation of each study was completed using an assessment rubric designed after that used in EPPI-Reviewer.

#### 3.1 Descriptive Data from Keywording

The total number of studies captured for this review was 514. While 298 studies progressed to the second screening phase, only 113 met the required criteria for inclusion in the keywording stage. Keywording guidelines were developed to organize and compare the results of the studies. After applying these guidelines, 35 studies were eligible for analysis, the results of which are presented in Chapter 4.

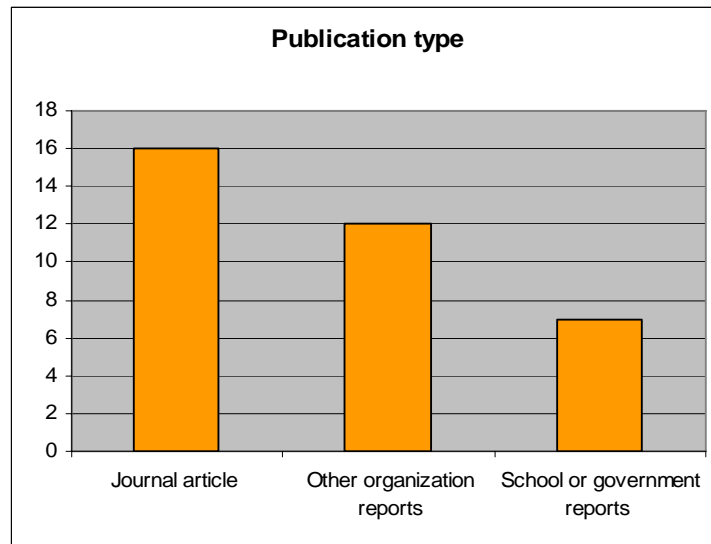
##### Publication Characteristics

This review focuses on research conducted in Canada, USA, Britain, Australia, and New Zealand. Among the 35 studies included in the review, 28 (80%) were conducted in the United States and used data from the US. Four (11%) originated in Canada and the remaining three (9%) took place in Australia. The limited number of studies from Canada should be noted when interpreting results.

Figure 3.1 summarizes the sources of the studies. Journals were the most common with a total of 16, followed by "other organizations report," and lastly by "school or government reports." "Other organizations reports" include those published by organizations such as National Research Center for Career and Technical Education or the Australian Vocational Education and Training Research Association.



Figure 3.1 Number of Studies by Publication Type



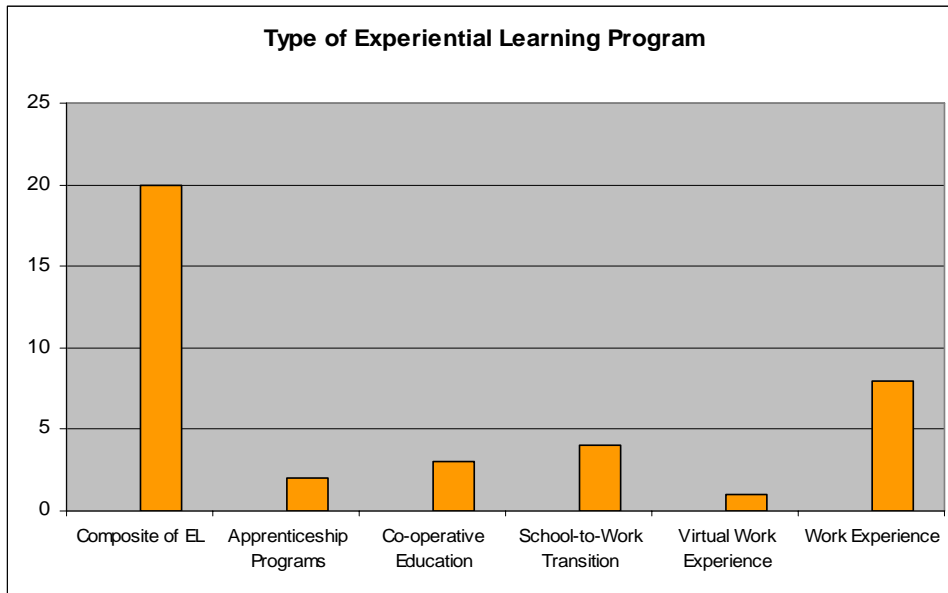
**Program Characteristics**

Figure 3.2 represents the number of studies that focused on each of the identified experiential learning (EL) programs. Among the 35 studies examined, the majority concentrated on EL programs in general. Since these types of studies sought to evaluate and make statements about the effectiveness of EL programs in general and did not attempt to disaggregate results by individual or specific program type or compare one to another, a label of “Composite EL program” was applied.

Work experience programs were the second major program focus in the literature, with school to work transition programs, co-operative education programs, apprenticeships programs and virtual work experience programs receiving minimal attention. No studies focused on job shadowing or job twinning in particular, although these types of programs were referred to in discussions about the impact of CTE (career technical education) in some studies.

It should be noted that the total number of studies examining the various program types is greater than 35 because several studies focused on more than one program type.

Figure 3.2 Experiential Learning by Program Type

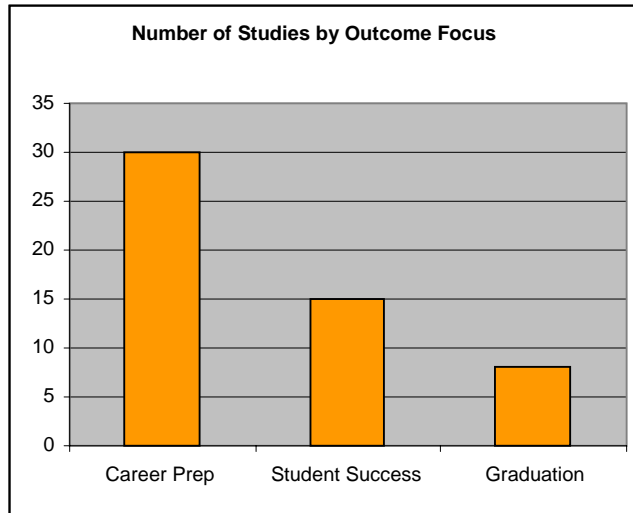


### Outcome Measures

This review seeks to determine what is known about the impact of EL programs on three main outcomes: student success; graduation and career preparation. The following section examines the distribution of studies examining these outcomes. A more comprehensive analysis, including how they may relate to EL programs, is provided in Chapter 4 – Results.

Before examining the various outcome measures individually, it is worth noting the breakdown of those measures as reported in the literature reviewed. As seen in Figure 3.3, the majority of the studies examined EL programs in the context of career preparation outcomes. Close to 86% of the studies focused on the effect of programs on students’ future career paths, while roughly 43% looked at student success and fewer still, less than one quarter (23%), examined graduation results.

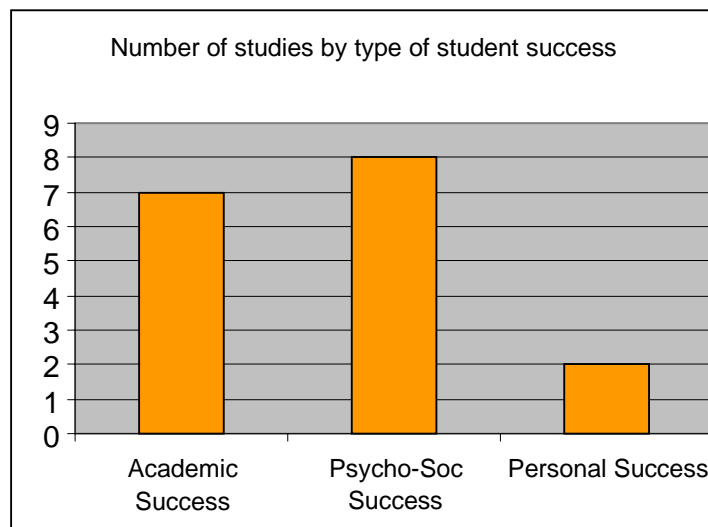
Figure 3.3 Number of Studies by Outcome Focus



*Student Success*

A total of 15 studies examined some type of student success in relation to EL programs, and most examined more than one. For the purpose of analysis and synthesis, student success is separated into three categories: student success - academic, student success - psycho-social, and student success - personal. As indicated in Figure 3.4 psycho-social success and academic success are the main student success outcomes examined in the studies included in this review.

Figure 3.4 Number of Studies by Type of Student Success

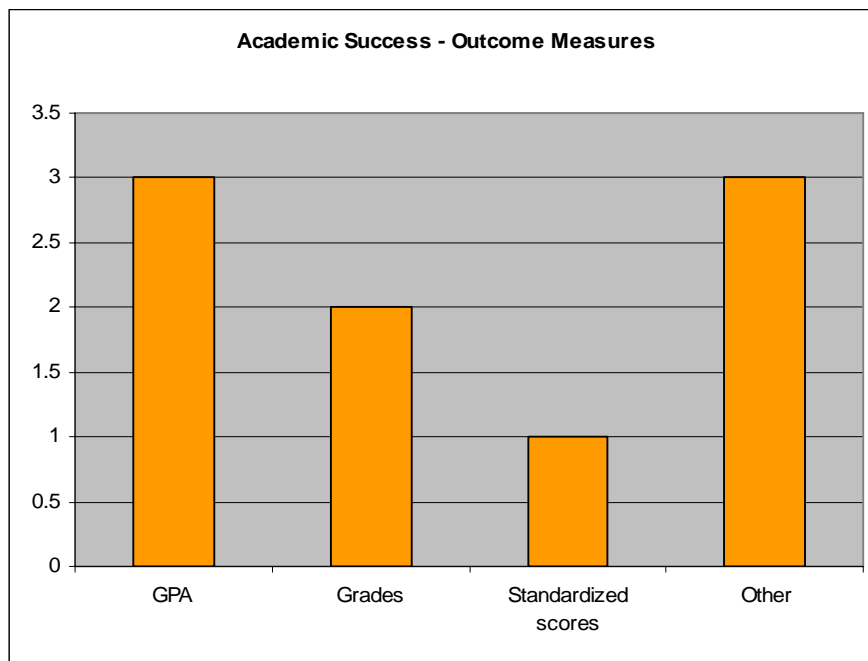


Based on a review of the pre-search literature, it was decided that a set of potential outcome measures for each student success category was required to distinguish how each form of success was being assessed.

The student success - academic category was keyworded using four measures: GPA, standardized test scores, grades, and “other.” A similar disaggregation was used for psycho-social success. This category was broken down into six measures: self-esteem, engagement, socialization and leadership, locus of control, motivation, and bullying. Drug use, crime, improved parent-child relationships, and rates of teen pregnancy were used for the personal success subgroup.

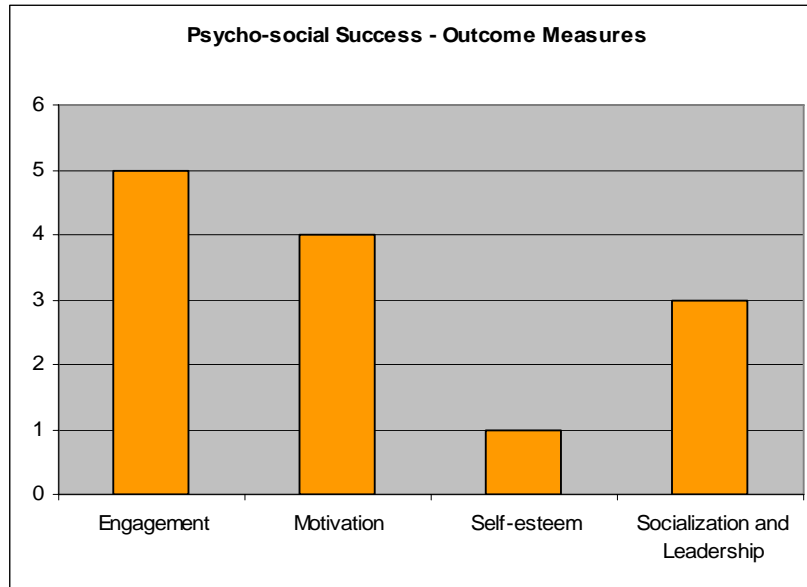
Figure 3.5 shows the frequency distribution of academic success indicators. GPA and “Other” impacts were the outcomes most often measured, followed at some distance by “standardized test scores” and “grades.” Under “other” the most common impacts mentioned were English and math self-efficacy and getting a pass in reading, math and writing.

Figure 3.5 Number of Studies Examining Different Academic Success Outcome Measures



The research addressing the impact of EL programs on the psycho-social component of student success suggests that engagement and motivation are most often used as outcome measures, followed by socialization, leadership and self-esteem. Five studies found an association between participation in an experiential learning program and student engagement; four studies discussed the impact on student motivation, three provided information on increased socialization and leadership as a result of a participation in an EL program. Only one study presented data on the effect of the experiential program on students’ self-esteem, while locus of control and bullying were not used in any of the studies.

Figure 3.6 Number of Studies Examining Different Psycho-social Success Outcome Measures

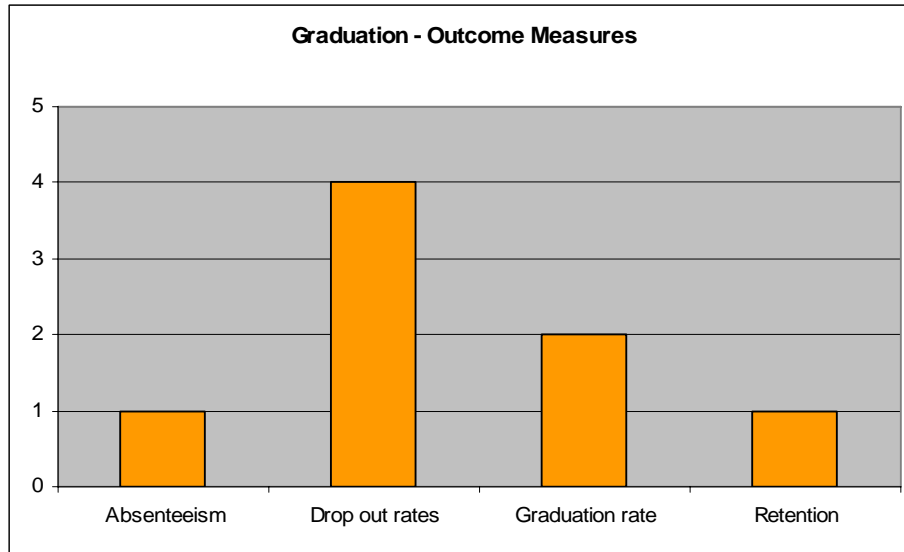


Lastly, only two studies examined the relationship between participation in an experiential program and personal student success. Both studies use improved parent-child relationships as an outcome measure.

*Graduation*

This section maps the eight studies that examined the impact of experiential learning on secondary school graduation. A relatively small number of studies explored this relationship. As with the previous outcome measure, *Student Success*, *Graduation* was disaggregated into major outcome measures: drop out rates, absenteeism, suspensions, expulsions, retention and graduation rate. Four studies reported lower drop outs due to participation in an experiential learning program, two studies stated increased graduation rate as an impact, and only one study mentioned absenteeism and retention as outcomes. Figure 3.7 presents the findings.

Figure 3.7 Number of Studies Examining Different Graduation Outcome Measures



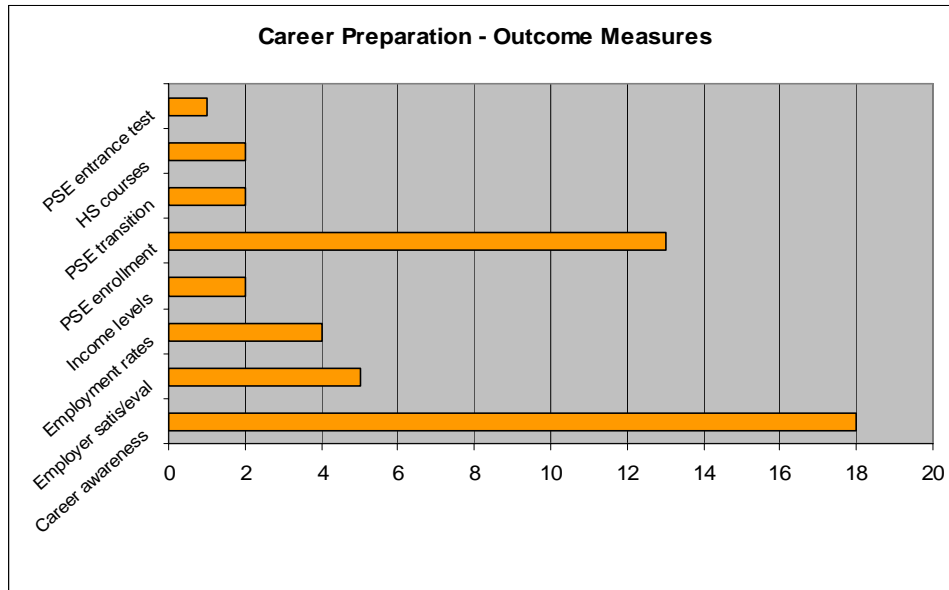
**Note:** No studies used suspensions or expulsions as outcome measures.

### *Career Preparation*

This final section maps the research that explored the impact of experiential learning on students' preparation for future post-secondary pathways. At 30, this category includes the largest number of studies. Thus, almost all the studies meeting the criteria for this review explore the relationship between EL programs and career preparation; many of which used more than one outcome measure.

Figure 3.8 presents the summary of the findings from the 35 studies included in the final analysis. Again, this category was sub-divided into eight different outcome measures: types of courses students chose in high school, career awareness, employer satisfaction/evaluations, employment rates, future income levels, PSE enrolment, school to PSE transition within the same career area, and writing a PSE entrance exam. Career awareness was the outcome most often measured, followed at some distance by PSE enrolment. There were far fewer studies reporting employer satisfaction, employment rate, types of courses students chose in high school as outcomes. Future income levels as an outcome was mentioned in only two studies. Again, some studies used more than one outcome, thus the sum total of studies is greater than 35.

Figure 3.8 Number of Studies Examining Different Career Preparation Outcome Measures

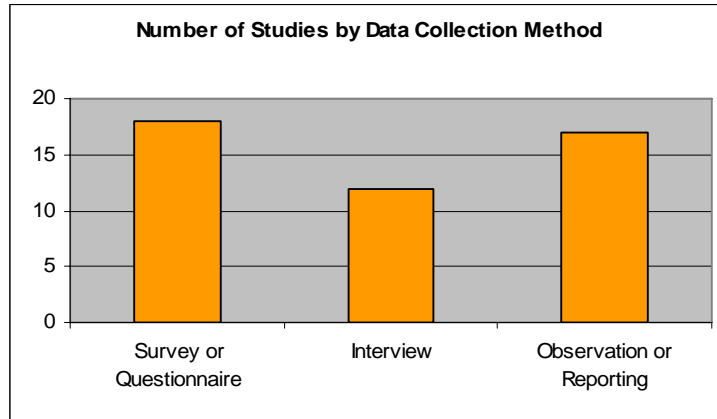


The results show that most of the studies used career awareness as a measure of the impact that EL programs can have on career preparation. By developing an understanding of who they are – values, interests, aptitudes, abilities, personal traits and desired life style – students may be in a better position to evaluate their educational options and career alternatives.

**Data Gathering**

This section of the keyword mapping presents information about how researchers gathered their data. Three main methods of data collection were: surveys/questionnaires; interviews; observation and reporting. The latter method encompasses those studies where researchers were present and interpreting student outcomes, or where they used academic data available at varying levels of education administration. Figures 3.9 maps the number of studies using each method.

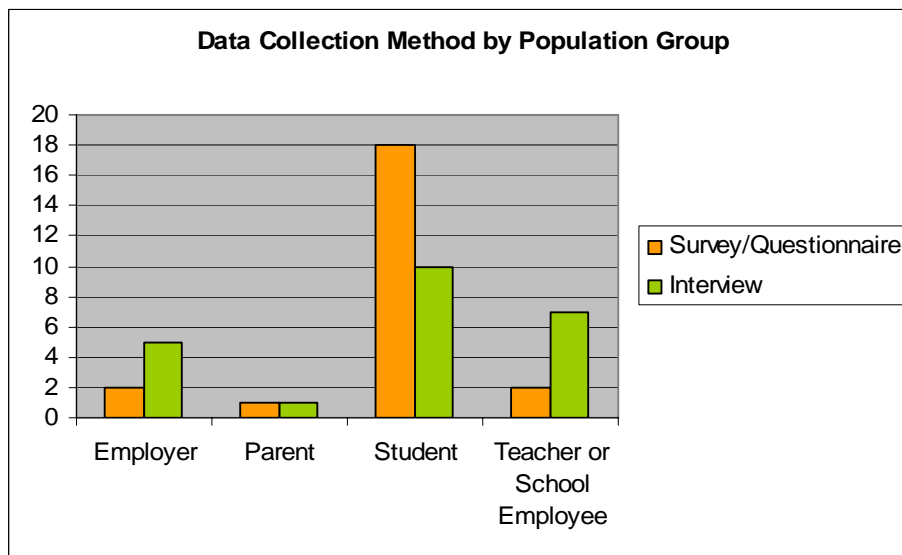
Figure 3.9 Number of Studies by Data Collection Method



Given the nature of topic and the availability of large-scale data sources in the USA, it is not surprising that many authors made use of existing data sources and survey/questionnaire techniques to assess students' experiences with EL programs.

Figure 3.10 presents the data collection method according to the population group of focus, while Figure 3.11 differentiates the Observation and Reporting category by educational level.

Figure 3.10 Data Collection Method by Population Group

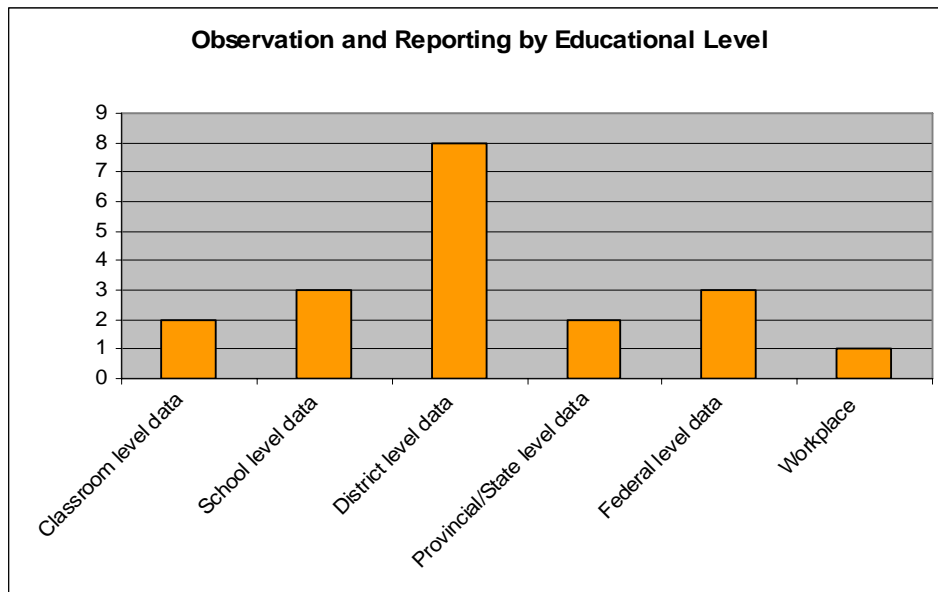


It is perhaps unsurprising that survey and questionnaire techniques dominate the literature when collecting data from students, since their sheer number compared to



other population groups makes the use of interviews far less likely. Questionnaires permit researchers to collect data in both a timely and cost efficient manner. Figure 3.11 shows the level of data used by those researchers who employed observation techniques or utilized pre-existing student achievement data. District or regional data appears to be the most common data set for secondary analysis or researcher observation in this group of studies.

Figure 3.11 Student Data by Point of Access for Observational and Reporting Methods



The purpose of the Mapping section was to provide a general break down of the various characteristics of the body of literature as elicited through the keywording stage of the review and to supply the reader with distinctive features of the literature before moving on to the next stage of in-depth descriptions and quality assessment. In some cases, Maps are used to narrow the scope of a review question or to uncover existing gaps in the research. In this case, the map highlights a number of noteworthy features of the literature devoted to evaluating EL programs in relation to student success.

First, the majority of studies are produced by various levels of government and other research or educational organizations. One could expect, as a result, fewer experimental or quasi-experimental designs. Which is to say, much of the research may be more descriptive in nature rather than evaluative, and the research that is evaluative may be less rigorous due to limited use of control groups or statistically controlled moderator variables.

Second, career preparation was by far the most explored outcome for EL programs. Nearly all the studies used one or more indicators of, or proxies for, career

preparation. Student success indicators were also relatively popular, although less than half of the studies examined them. Few studies looked at the value of EL programs as a facilitator of retention and graduation.

Last, there is no clear frontrunner in terms of the popularity of one EL program over another. In fact, the majority of the research seeking to examine and assess EL programs appears to draw from multiple types of programs. Hence, the major EL program type in this review was a composite program.

Chapter 4 – Results will address the findings of the research in detail, however before proceeding to the analysis, brief descriptions of the 35 studies are provided below. These are followed by a section devoted to assessing the quality of those studies.

### 3.2 Study Descriptions

*Alfeld et al. (2007)*. The authors were interested in determining whether Career and Technical Student Organizations (CTSO) either directly or indirectly affected three outcomes of secondary education: achievement, transition to postsecondary and employability. They conducted a large quasi-experimental study using a pre-test/post-test survey comparison of high school students in CTE classes that included a CTSO, CTE classes without a CTSO, and general non-CTE classes such as English and social studies. Authors stated that CTSO provide four important elements: leadership, community service, competition, and professional development (the acquisition of knowledge and competencies that will be useful for future work in the profession; most CTSOs provide structured professional development activities for their members, including guest speakers, workshops, and conferences). “Findings showed that on a variety of measures, CTSO students began the school year with similar or higher scores than the other groups of students and did not change (gain or lose) as much as did the other groups over the course of the year. With the exception of college aspirations—where students in the general classrooms reported the highest levels—the scores of the CTSO students remained higher than those of students in the other two groups on all measures. A positive association between amount of CTSO participation and academic motivation, academic engagement, grades, career self-efficacy, college aspirations, and employability skills was also found. Finally, of the four specific organizational elements of CTSO, competitions were found to have the most positive effects” (p.iii).

*Bennet, J. V. (2007)*. In this study, Bennett examined the efforts of a large, urban school district to reduce risks of future occupational disengagement of students by requiring all high school students to complete 60 hours of work-based internships. The hypothesis was that social support from adult supervisors and mentors would positively affect students' occupational engagement orientations over and above the influence that programmatic experiences provide. Data were collected from students in attendance at 17 high schools (N = 1,741) some of whom were attending the district's CTE centres. The findings indicated that opportunities to receive social

support, especially having a mentor, contributed most to seniors' future dispositions toward occupational engagement. District career and technical education (CTE) students also experienced greater social support than non-CTE students. A one-way analysis of variance (ANOVA) revealed statistically significant differences in the social support students received and in their occupational engagement orientations (OEO). The CTE students had higher OEO scores than other high school students, while a greater proportion of career centre students received mentoring and encouragement. The CTE students also experienced more performance feedback from school staff than other high school students, a more personalized, and supportive learning environment than the regular comprehensive high school students and were better prepared for their occupational futures.

*Billett, S. & Ovens, C. (2007).* The authors explored students' experiences of paid work through part-time employment. The results showed positive impacts of the program on career awareness. Consistently, across all cohorts of students, there was support for reflecting upon paid work experiences as being an effective resource to learn about the world of work and to consider post-school options. This support manifested itself differently across students. Some students agreed that the kind of processes trialled in this project were helpful in thinking about the world of work beyond school. Where this was the case, there seemed to be an association between the facilitative capacity of the teacher and student cohorts reporting this response. Overall, through deliberations and discussions, the students in the study were able to use workplace experience to inform them about work, working life and post-school options.

*Bristow, R. & Anderberg, M. (1999).* High school graduates were surveyed after graduation regarding the extent to which they were engaged in activities endorsed by the state's School-to-Careers (STC) initiatives (such as classroom speakers from business and industry, career-oriented field trips, job shadowing, internships and other eligible school-related, work-related, and career connecting activities) during their senior year in high school. The purpose was to gather baseline information on STC programs, services and activities operating in the schools to determine the impact they may have had on students' post-high school experiences and career decisions. The study found that not everyone who participated in the survey took full advantage of the opportunities and services available for maximizing their educational opportunities and making informed career decisions.

*Bumgarner et al. (2003).* The study examined a summer health careers program in existence for 10 years which has created interest in high school juniors and seniors to pursue healthcare professions. "The program, which is now open to all students, began as a recruitment initiative to encourage underrepresented minority and disadvantaged students to pursue health careers in a rural [US] county [...]. Seventy percent of the 160 students who have participated in the program are pursuing or practicing a health profession, and of these, 50% chose nursing". Authors suggest that the success of the program is due to the "[c]ollaboration between an Area Health Education Centre, a local community hospital, and county school system".

The program begins with a didactic portion followed by a day of tours. The second phase involves 40 hours of clinical observation in an area of specific interest to each student (including a "shadowing" or observation phase) over a period of 4 to 6 weeks. The researchers believe that the program helps validate the student's decision to pursue a healthcare profession or, at times, the decision not to pursue a healthcare profession.

Canadian Medical Hall of Fame & Pfizer Canada (2007) presented information on the Discovery Days Program, which is a "one-day opportunity for secondary school students and teachers to explore the exciting career options that are available to them in medicine and the health sciences" (p.2). The program began in 1997 and over the past eleven years, 46 Discovery Days have been held at 12 universities and colleges across Canada, involving more than 9,500 students and teachers. A pre/post evaluation of the program suggested that these types of events are beneficial for raising the career awareness of students. When students' beliefs and attitudes towards a career in the health sciences before and after Discovery Day were compared, results showed an increased interest in the health field.

*Colorado Department of Education, (1999).* The study examined what motivates today's students in school and how prepared these students are for their future through the implementation of School-to-Career across Colorado. The findings purport that: "(1) high school seniors are motivated by classroom instruction that includes a chance to apply active, hands-on lessons and solving real world problems; (2) they are motivated by teachers who are knowledgeable and enthusiastic about the subject and use humor related to the subject; (3) students are motivated to learn when they are interested in the subject and when they see how the class relates to their career interests; (4) 65% of the students are bored in school half or more of the time, and only 20% find lectures motivating, but few consider dropping out; (5) students who had had career experiences (such as job shadowing, job connecting to a class, internship, or a written academic or career plan such as required by School-to-Career across Colorado) – about 80% of the students – were more likely to go on to postsecondary education, select a college based on a career area of interest, and select a college major; (6) students with career experiences also were more likely to know their career interests and abilities, to be excited about their future, and to be less bored with school." (from *ERIC Abstract*).

*Cumming, T. & Lesniak, G. (2000).* These authors explored the possibility of improving employability skills through cooperative education and high school program known as Tech Prep. The study included 106 high school students from two neighbouring suburban communities, 23 local employees, and 86 vocational and academic teachers. A goal of the research was to determine if employability skills were being taught in the classrooms and if students felt that they received adequate training to prepare them for the world of work (and of course to focus on those employability skills the students were lacking). "The results were used to develop an intervention to emphasize the relevance to the real world and the use of cooperative learning strategies to facilitate development of skills in the following areas: job

search, communication, technological literacy, work ethics, critical thinking, work safety, teamwork, and career exploration” (p.ii). Employment skills activities were used in the vocational computer classes, Tech Prep computer classes, and co-op education class at the high school. Post-intervention data suggested that classroom interventions increased the employability skills awareness of the students.

King, A. J. C., Warren, W.K., Boyer, J.C., & Chin, P. (2005). This study was designed to examine the effect of the Ontario double cohort (caused by the elimination of Grade 13) and the reorganized program on future college and university enrolments, and to study the factors affecting student progress and secondary school graduation rates for the first five cohorts of the reorganized program. Each phase of the study had two primary goals. The first goal was to develop projections for the application rates to Ontario colleges and universities. The second goal was to examine the implementation of the reorganized program in Ontario secondary schools and determine its impact on student progress to graduation. The study surveyed 17,479 students from 88 public schools, 42 Roman Catholic schools and 21 French language schools. The measured outcomes of interest for this review included career awareness (students in coop participated in the programs to gain useful work skills, to explore a possible career, to improve chances of admission to college or university, and to apply classroom learning to practical work experience); a decline in PSE enrolment (cooperative education participation rates for Grade 12 students declined over three years prior to the study from 22.6 to 17.3 percent and to 16.7 percent. and notably fewer university-bound students have been taking cooperative education).

*Dykeman et al. (2003).* This study investigated the impact of career development interventions on academic self-efficacy and motivation. The two major research questions were: (1) What is the predictive value of career development interventions for academic self-efficacy beyond the background variables of gender, SES, race/ethnicity, parent educational level and prior achievement?; and (2) Beyond the background variables, what is the predictive value of career development interventions for academic motivation? A nationwide sample of 293 youth from 20 high schools was assessed on a variety of variables including motivation, academic self-efficacy, and participation in 44 clearly defined career development interventions. Four-cluster author-developed taxonomy of career development interventions were employed: Field, Advising, Introductory, and Curriculum. The results proved no predictive relationships between levels of participation in the interventions and academic motivation and self-efficacy.

*Fawcett, M & Maycock, G. (2001).* This study measured the “differences in the levels of career indecision for high school seniors who were African American, Asian, Hispanic, Native American, White, or mixed race, and are involved in activities in a STW (school-to-work) program of an urban high school. A demographic survey and the Career Decision Scale (CDS) were administered to [113 high school seniors] to measure the effectiveness of the program participation on career decisiveness levels. Analysis determined no differences in career decisiveness based on racial

identity between African American and White students, and showed a positive relationship between students who were active in STW programs and their level of career decision-making confidence” (from ERIC Abstract).

*Finnan, C. & Chasin, G. (2007).* This study presented the story of a dropout student, Anthony, who “was bored in school, had no support or encouragement from his family or his teachers, and lacked motivation. After he quit high school, his story took a different turn” (p. 625). The program “*Affiliated Alternatives* brings together four alternative programs for students at risk of failure or who have already dropped out: Alternative Education Resource Options [...], the Cluster Program [...], the School-Age Parent Program [...], and the Work and Learn Centre [...]. Anthony was eligible for the Work and Learn Centre program WLP” (p. 627). He worked in a preschool program for some time and on a construction project for a while. Anthony graduated from the WLC program and is not in university; he intends to pursue a career in teaching.

*Gentry et al. (2007).* “This qualitative study addressed the question of how talented and general education students’ part-time CTE (career and technical education) experiences differed from their traditional high school experiences. This qualitative study utilized data from one exemplary CTE Centre. The secondary students in this study simultaneously attended both the CTE centre and a traditional high school. [...] Both talented and general students commented favourably on their CTE experiences and negatively on their traditional high school experiences. The four major themes from their comments included autonomy; effective, caring teachers; students with similar interests; and relevant content in an applied setting. Students appreciated the ability to choose courses and determine the order or type of assignments, to self-pace the curriculum, and to experiment with a profession (autonomy). They also commented on the presence of teachers who had high expectations, sought student’s strengths, showed personal interest in the students, and had professional experience (effective, caring teachers) in the CTE setting. The students’ perspectives included the observation that at the CTE centre they were exposed to other students who demonstrated mature and committed behaviours, showed interest in their course of study, and participated in Career and Technical Student Organizations (students with similar interests). Finally, the learning environment at the CTE centre offered curricular connections to the profession, hands-on learning, and professional treatment of students in a job-like setting (relevant content in an applied setting).” (p. 373)

*Gentry et al. (2005).* This study sought to examine and understand the perceptions and experiences of students in a CTE education setting, specifically a careers centre that they attended daily for half a day during the school year. Of specific interest to this project were the experiences and opportunities that promoted the positive perceptions of the students who attended this school. The CTE centre in question emerged as “an anomaly in a national instrumentation study concerning secondary student perceptions of their classroom experiences. Student perceptions concerning Appeal, Challenge, Choice, Meaningfulness, and Self-Efficacy at this centre existed at levels much higher than those of the other 7000+ students in the sample, leading the

authors to wonder what distinguished this particular school from the other 25 schools in the sample.” (pp. 47-48). “This study found that when compared to peers in general high school settings, students [...] perceived significantly more appeal, challenge, choices, meaningfulness and self-efficacy in their classrooms. [...] Themes of professionalism, sense of community, and reason to learn emerged in data analyses. Results offered methods that secondary educators can use to engage students in meaningful, challenging learning. Findings led to the conclusion that efforts to leave no children behind should include CTE as part of the continuum of educational services.” (p. 47)

*Hughes, K. L. & Golann, J. W. (2007).* This study focused on a Virtual Enterprises program and its influence on students’ career and college readiness. Authors noted that “Virtual Enterprises International (VE) is a high school program that teaches students about business through task-oriented and hands-on coursework” (p. 1). The report provided a description of the program and discussed the relative effectiveness of various aspects of the program such as technology use, project-based learning, and outside-the-classroom activities. A combination of qualitative and survey methods used to collect data for 16 VE firms in 10 New York high schools. Results regarding PSE enrolment suggest that participating in VE helped the majority of the students’ surveyed feel more prepared for college. “Sixty-six percent of them indicated that VE improved their confidence about being prepared to do college work [and] 63 percent indicated that VE made them believe that college was a realistic option for them. Forty-six percent of the students said that their VE teacher helped them with college planning [...]. Sixty-seven percent of the students surveyed indicated that VE helped them focus on what they wanted to study in college.” (p. 24) With regards to career awareness, the study indicated that students acquired a variety of workplace skills, including office skills, computer skills, problem-solving skills, and interpersonal skills. The vast majority (84 percent) of survey respondents indicated that they could use the skills learned in VE for future employment. These responses suggest that VE is indeed providing students with an education that seems relevant to their future and is helping them make the connections between school and work.

*Joyce, M. & Neumark, D. (2001).* The authors were interested in “studying the extent to which school-to-work programs have been implemented in [the high school system...] as well as the extent to which high school students are choosing to participate in these programs.” (p. 38). The study examined the prevalence of these programs from two different perspectives: investigating the kinds of schools offering such programs and the students participating in them. Data from the 1997 National Longitudinal Survey of Youth and the 1996 School Administrator’s Survey were used. School-to-work programs included in the study were internship/apprenticeship programs, job shadowing, mentoring, school-sponsored enterprise, career major, and cooperative education. The results of the study include: “school-to-work programs are commonly offered in U.S. high schools with more than 60% of schools providing at least one such program” (p.48); and “38% of students reporting having participated in at least one program” (p. 48). Moreover, “students who work while

going to school are more likely to participate in school-to-work programs, as are youths who reported their course of study in high school as technical, vocational, or business-oriented.” (p. 48).

*Kenney, L. M. & Collet-Klingenberg, L. (2000).* The authors describe a Youth Apprenticeship (YA) program in which “a university, a public secondary school and a manufacturing company have been collaborating in offering an alternative education program to juniors and seniors who are not expected to graduate. The program takes place at the manufacturing site where students who are youth apprentices spend about 20 hr each week in work and another 20 hr in the classroom at the site. After 2 successful calendar years in this competency-based program, youth apprentices earn a high school diploma. They are graduating from this program with useful skills, improved behaviour, and academic qualifications for higher education. [...] Most important, the YA Program adds educational options for the apprentices themselves. The program has been recognized regionally and nationally for its design and effectiveness” (pp. 50-51). Some of the stated impacts of the program are grades, improved parent-child relationships, and graduation (reduced expulsions from school).

*Levesques et al. (2008).* The authors sought to describe the full range of career and technical education during the period from 1990 through 2005. To capture this diverse group, the report analyzed data from 11 different National Centre for Education Statistics (NCES) surveys. The study reported impacts of the programs in the area of career preparation and employment rates, PSE enrolment, school to PSE transition, and on the types of courses chosen by students in high school. Specifically, the more occupational credits male graduates of the class of 1992 earned in high school, the more often they worked full time in 2000. Also, the more occupational credits graduates earned in high school, the less often they enrolled in postsecondary education within 8 years of graduating, the more often they attained a sub-baccalaureate credential and the less often they attained a bachelor’s or higher degree by 2000. The study also reported that between 1990 and 2005, the enrolment in core academic courses (English, mathematics, science, and social studies coursework) of graduates who participated in the occupational curriculum increased. The study did not find an impact on income levels.

*Levesque et al. (2000).* This report examined vocational education in the US. The authors sought to describe the evolution and current trends in vocational education and present findings about the academic preparation of high school students who participate. Analysis of data from nine separate national surveys sponsored by one of three federal statistical agencies: [the National Center for Education Statistics] NCES, the Bureau of Labour Statistics (BLS), and the Census Bureau was completed for this study. “The surveys were administered to representative samples of students, teachers, adults in the general population, schools, and/or employers” (p. 12) The results showed positive impacts on PSE enrolment, on employment rates, on school to PSE transition within the same career area, and on types of courses students choose in high school. Findings also indicate that vocational concentrators were more likely than students completing general coursework in high school to be



employed while in school, and that vocational concentrators generally increased the rigor of their academic coursework, particularly in mathematics, science, and social studies. However, in 1994, vocational concentrators still completed fewer total credits in each of the core academic subjects than did either college preparatory students or those completing general coursework in high school.

*MacAllum, K. & Cherner, I. (2000).* The authors examine “an academically rigorous, business/labour driven school-to-career program (Lansing Area Manufacturing Partnership) that includes business, union, school, and parent partners and emphasizes work-based and project-based learning, team teaching, and opportunities for staff and students to establish close and ongoing interaction with employees” (from ERIC abstract). This case study drew on various methods to gather data, including observations, focus groups, interviews, document reviews, and surveys. The authors indicate that the program had positive impacts on all stakeholders, including employers, union members, mentors, and parents.

*Mulraney et al. (2002).* This report investigated current practices used in EL programs with small enterprise links using a theoretical framework for structured workplace learning. A total of 41 students (from 6 schools) were interviewed, a total of 18 staff who were administering the VET programs were also interviewed, and a larger number of small enterprises were involved in the study (a total of 26 small enterprise personnel were interviewed in several community organisations (such as golf, bowls and service) and across eight industry sectors (including hospitality, retail, office management, finance, information technology, telecommunications, furniture construction and food preparation). The stated impacts were on student engagement (students reported positive learning outcomes from their experiences and significant learning in workplace relations), socialization and leadership, and employer satisfaction/evaluations.

*Noonan, A. E., Hall, G. & Blustein, D. L. (2007).* The authors examined “two interrelated facets of the school-to-work transition among urban high school students: their relationships with important adults within that transition and the ways they experience the subjective aspects of social class and class-related constructs in those relationships. (p. 542). The study involved 27 students at a variety of schools. Schools featured different types of programs focussing in the areas of “Business and Technology, Health Law and Government, Education, Media Arts and Communications, Bio-Engineering, Finance and Economics, Forensic Sciences, Travel and Tourism, and Health and Human Services” (p. 546). Data were gathered using interviews. Analyses found that the programs had a positive impact on students’ self-esteem and student engagement.

*Padula, C. A., Leinhaas, M. M. & Dodge, K. A. (2002).* This report “described a pilot project designed to encourage career interest by minority high school students in health professions in geriatrics and gerontology” (p. 529). Nineteen students in grades 10 to 12 completed the program over a five week period. The program design included classroom and field components, as well as lectures, independent and

group research projects. The impact of the program on students' career awareness was reflected in the finding that "57% of students said they would consider a career in geriatrics, 10% definitely wanted to become nurses specializing in geriatrics, while 33% replied they probably would not consider a geriatrics career" (p. 541).

*Patrick, E. S. (1999).* This study used school-to-work data on students in Career and Technology Education courses for the 1998-99 school year in the Austin Independent School District. School-to-Career (STC) or Career and Technology Education (CATE) is a "system of integrated school-based and work-based learning that integrates academic and occupational learning." (p. 3) The sample consisted of 18,261 students who were enrolled in CATE courses, 11,766 of them were in high school and grouped into 3 categories according to their level of participation in CATE: CATE elective, CATE coherent, Tech prep. The results from this study showed that students in grades 11 and 12 who participated in CATE have a higher reading and writing passing rate on Texas Assessment of Academic Skills than non-CATE students. Moreover, Tech Prep students had the lowest dropout rate and the highest post-secondary enrolment rate of the 1996-97 cohort. Dropout rates at grade 12 were reported as follows: CATE Content (0.8%), CATE Elective (0.9%), Non-CATE (2.4%).

*Philips et al. (2002).* The authors used an open-ended interview style to determine what factors facilitate students' transition from high school to work. The results from the interviews identified some of the factors that facilitate the readiness for transition from high school to work. Readiness is promoted by work-based learning and exploration. The objective readiness hypothesis (work skills and realistic plan) received support in 70% of the narratives. The psychological readiness hypothesis (resilience and optimism about a clear vision) received support from only 35% of the narratives.

*Plank, S. (2001).* The study examined "the relationship between various mixes of career and academic course loads; achievement; persistence and PSE destination. Data were from the National Education Longitudinal Study of 1988 which used a two-stage stratified sample of approximately 25,000 eighth graders in more than 1,000 public high schools. For the purpose of creating comparison groups, Plank categorized students into "academic concentrators"; "dual concentrators"; "CTE concentrators" and "neither" (students who did not fulfil the criteria any of the other categories). The author reported that achievement was highest for academic concentrators, followed by dual concentrators, the neither group, and lastly the CTE concentrators. Furthermore, the author predicts that mid-range integration of CTE and academic scheduling carries the greatest potential to reduce the likelihood of dropping out, and that this is most salient for students who are at relative high risk of dropping out.

*Smith, E., Green, A. & Brennan R. (2001).* The authors examined the different types of learning experienced by students who gained their workplace experience through structured work placements arranged by their school or through part-time work. The project also examined access the workplace experiences is more difficult for some

students than others. The study includes a literature review, interviews with key stakeholders, a survey, and nine case studies (involving focus groups with students, teachers, career advisers, and Principals)). The survey sample consisted of 1,451 students from 13 schools (public and private) in grades 10 through 12. The survey results showed an impact of the type of program on students' engagement: work helped (more than non-paid work experience) students to learn general skills in the work place and career awareness (i.e., students began to have a clearer idea of what they wanted to do).

*Stone, J. R. & Aliaga, O. (2005).* This study examined participation in two types of experiential learning: Career and Technical Education and School-to-Work activities. The authors investigated "the relationship between students' background characteristics and curriculum concentration, and key education outcomes, including course-taking patterns, high school GPA, school completion, and post-school expectations" using data from the National Longitudinal Survey of Youth 1997 – 9,000 12 to 16 year-olds (p. 125). The authors concluded that ethnic, racial and socioeconomic differences exist among youth in the four curriculum concentrations [general, academic, CTE, dual]. CTE concentrators, more than general concentrators, appear to benefit from changes aimed at increasing the academic rigor of their high school programs, as evidenced by their enrolment in math and science courses, high school GPA, and school completion (p. 125).

*Swail, W. S. & Kampits, E. (2004).* The authors wanted "to identify the types and breadth of work-based learning activities that four-year college students experienced during high school, and to determine the correlation of these activities on their postsecondary experience" (p. iv). The sample consisted of 1,613 freshman students. The summary of findings indicates that two-thirds of the survey population expected or planned to complete an academic program beyond the Baccalaureate (BA). The study also found that participation in work-based learning activities or in community service was associated with slightly higher freshman GPA; and that 57% percent expected to pursue academic studies beyond the four-year bachelor's degree. For students who participated in one or more EL programs, this expectation rose to 60 percent, and rose again to 64% when students participated in two or more activities programs.

*Taylor, A. (2003).* This study examined high school students' work experiences in the field of information and communications technology (ICT). A total of 33 students were surveyed in 2001 and 2002. Interviews were also conducted with six students, five employers, a work experience coordinator and a representative from the Careers Foundation. The author surmised that ICT internship experience attracted, and was more positive for, those who were already preparing for a career in ICT. The author notes the existence of a gendered atmosphere and notes that female and male interns responded differently to their ITC internships. Analysis of these findings is interpreted using Bourdieu's theory of capital and habitus.

*Teitelbaum, P., Kaufman, P. & Burns, S. (2002).* This study examined the labour market outcomes of a cohort of non-college-bound students who graduated high school in 1982 by addressing the following questions: 1) What is the impact of vocational and academic curricula on labour market experiences? 2) Is there a strong positive relationship between high school academic achievement and labour market success? 3) How does high school work experience or participation in co-op programs influence labour market outcomes? 4) Do these effects persist over time? The programs evaluated were work experience and cooperative education programs.

This study used data from the *1980 High School and Beyond (HS&B) Fourth Follow-up Survey*. The survey questioned 14,000 former high school students who were interviewed in 1980 as sophomores, and again as seniors or dropouts in 1982. "The HS&B data contain information about the number of jobs students held in a given year, their starting and ending dates of employment, earnings, number of months out of the labour force, and job training, allowing for more refined analyses" (p. 5). The study reported positive impacts of the work experience on income level, however there was no impact for coop program on employment rates.

*Valadez, J. P. (2003).* The author investigated high school student's perceptions about becoming an educator and about the current condition of education. Participants were 52 senior students from a magnet school in Texas that opened in 1993. Data were gathered using a questionnaire. The author reported positive outcomes in the form of career awareness. Students who have received a great deal of firsthand teaching experience viewed teaching as an positive and gratifying career.

*Visher, M. G., Bhandari, R. & Medrich, E. (2004).* The authors sought to answer the following questions: Who participates in career exploration programs? What are the characteristics of schools in which significant numbers of students participate? and Does participation affect students' high school completion rates and their preparation for college? as the study examined a number of different types of EL programs (career majors, coop education, internships/apprenticeships, job shadowing, mentoring, school-sponsored enterprise, tech prep). The authors used a sample of 5,372 students (main from the NLS97 survey, but supplemented through their own research). The study found positive impacts for EL programs on graduation rates. Students who participated in career exploration programs were more likely to graduate from high school, even when other student and school characteristics were controlled. Career exploration programs improved the future prospects of a large and diverse group of high school students by increasing the likelihood that they will graduate and go on to postsecondary education. Finally, students who participated in at least one career exploration program were slightly more likely than nonparticipants to take the SAT or ACT.

*Yan, W., Goubeaud, K. & Fry, C. (2005).* This study examined students' participation in school-to-work activities, students' knowledge and use of career-related resources, and students' perceptions of the degree they learned basic and career-related skills from their school. A survey was administered to a sample that consisted of 784 grade 11 students during the 1998-1999 school year. A follow-up survey was administered in the 1999-2000 school year when the students were in grade 12. The follow-up surveyed 851 students, including additional twelfth grade students. In total, about 1635 eleventh grade students returned completed surveys. Participants were students from eight schools in the school district. "Results of the study indicated that students' knowledge of career skills and participation in career-related activities varied by activity type and grade level. Although students were aware of career-related resources, many of these resources appear to be underutilized by students" (p. 219). The results of the analysis indicated that students believed that they learned basic career skills from their school to a moderate degree.

*Zanibbi et al. (2006).* This Canadian study used Social Cognitive Career Theory and Billett's research on workplace learning to validate the concept of exemplary practice in work-based education (WBE) programs. The authors used two case studies; one in a water and sewage treatment plant and the other in a health and fitness centre. The research team determined that career development and workplace learning are important purposes of WBE programs. "In order to help students negotiate the complexity of the workplace, it is important to place them on a 'pathway' that prepares them for the responsibilities and expectations they encounter in the workplace. This pathway can involve pre-placement training and instruction (soft skills, conflict resolution, interview skills); and it could also involve various forms of work experience integrated into the curriculum at earlier grades (e.g., job twinning or job shadowing in Grade 10 and work experience in Grade 11)" (p. 79). Authors argued that exemplary WBE programs include: effective communication, an emphasis on assessment and evaluation, linking school and workplace learning, and creating a pathway for students' future career choices.

### **3.3 Quality Evaluation**

An assessment of the quality of each study was carried out in order to provide context for interpreting the results of the studies. Evaluation of a study's quality provides a standard by which readers can compare and consider the stated findings for each investigation. In other words, prior to determining the confidence one can place on the findings and conclusions drawn by authors, considerations need to be given to the various attributes of a study, such as design and implementation, methodology, sampling and reporting.

Quality guidelines were developed based on those provided within the EPPI-Reviewer application. The key areas of assessment were: reporting (e.g., context, aim, sample, etc.), and methodology and data (e.g., design, reliability, bias control, generalizability, etc.). Two reviewers independently assessed the quality of 35

studies and randomly selected 20% (n=7) for reliability appraisal. The complete rubric is included as Appendix 1.

The quality assessment rubric includes 16 questions. A binary scale was applied to each guideline, 1 point for meeting the criteria, 0 for not meeting it. Overall scores were grouped into three levels of quality: “High quality” for those studies scoring above 13 points (80% of full score), “Medium quality” for those with a score from 10 to 12, and “Low quality” for those scoring 9 or below (60% of full score). Table 3.1 provides the overall scores for all 35 studies. Studies are presented according to their ranked score.

Table 3.1. Quality Evaluation Scores and Level

Author (year)	Total Score	Quality Level	Author (year)	Total Score	Quality Level
King et al. (2005)	15	High	Zanibbi et al. (2006)	11	Medium
Noonan et al. (2007)	15	High	Levesque et al. (2008)	10	Medium
Dykeman et al. (2003)	13	High	Levesque et al. (2000)	10	Medium
Hughes et al. (2007)	13	High	Mulraney et al. (2002)	10	Medium
Plank (2001)	13	High	Bennett (2007)	9	Low
Swail & Kampits (2004)	13	High	Billett (2007)	9	Low
Yan et al. (2005)	13	High	Fawcett & Maycock (2001)	9	Low
Alfeld et al. (2007)	12	Medium	Finnan & Chasin (2007)	8	Low
Gentry et al. (2007)	12	Medium	CMHF & Pfizer (2007)	7	Low
Joyce & Neumark (2001)	12	Medium	Cumming & Lasniak (2000)	7	Low
Phillips et al. (2002)	12	Medium	Kenney & Collet-Klingenberg (2000)	7	Low
Taylor (2003)	12	Medium	Patrick (1999)	7	Low
Bumgraner et al. (2003)	11	Medium	Bristow & Anderberg (1999)	6	Low
Gentry et al. (2005)	11	Medium	Colorado Dept. of Ed. (1999)	6	Low
Padula et al. (2002)	11	Medium	Smith et al. (2001)	5	Low
Stone et al. (2005)	11	Medium	Visher et al. (2004)	5	Low
Teitelbaum et al. (2002)	11	Medium	MacAllum & Charner (2000)	4	Low
Valadez (2003)	11	Medium			

Only seven studies (20%) were assessed as being of high quality. Fifteen (43%) were rated as medium quality and thirteen (37%) as low quality. While caution is suggested when interpreting the findings of the lowest quality studies, one can have greater confidence in the conclusions drawn by the top seven studies.

Three guidelines were particularly problematic for almost all the studies. These criteria included providing procedural justifications and issues of reliability and validity of data collection methods and tools. Only three studies (King et al., 2005; Noonan et al., 2007; Yan et al., 2005) were successful in providing all such information transparently.

The quality assessment guidelines that were applied include attributes that are considered basic to any research. It is therefore disconcerting that so many of the studies failed to meet some very standard expectations for quality research and reporting. For instance, two studies (Fawcett & Maycock, 2001; Finnan & Chasin, 2007) did not provide any information about the aims, questions or hypotheses for the research.

## 4.0 Results

This chapter synthesizes the results of the studies that met all the inclusion criteria. To the extent that the literature permits the synthesis seeks to answer the questions listed in the Ministry's request for proposal. In some cases there are simply too few studies to formulate reliable or generalizable conclusions.

To begin, a summary of the overall benefits of EL programs and the findings in terms of their impacts on outcomes (positive, negative or none) are presented. Although the original review questions sought to examine three broad outcome categories (Student Success, Graduation and Career Preparation), the larger category of Student Success has been disaggregated for the purpose of synthesis due to its size and diverse research foci. Thus, Student Success is analyzed under the sub-categories of Academic Success and Psycho-Social Benefit. In addition to the stated findings for each study, the corresponding quality ranking of the studies, as reported in Section 3.3, is also provided to allow the reader to consider the quality of a study when assessing and comparing it to others in its category.

The second section examines some of the demographic characteristics of students who participate in EL programs. Where possible, student level data are explored as they relate to various outcomes.

The final section addresses the barriers and facilitators of participation in EL programs from the perspectives of employers, parents and students.

### 4.1 Outcomes of EL Programs

#### Academic Success

Seven studies examined academic success as it relates to enrolment in EL programs. Table 4.1 shows the diversity of findings among those studies. Three report positive impacts and three report no notable benefit. One study, Alfeld et al. (2007), uses two measures of academic success (overall GPA and individual grades) and finds differing impacts for each.

It is difficult to state with any certainty whether experiential learning programs have an effect on academic success since half of the studies find positive effects while the others find none. Although four studies find positive outcomes, caution should be used when interpreting these findings since two of these studies are rated as being of low quality. Furthermore, of the four studies reporting no impact on academic success, two are of medium quality and two are of high quality. Based on the findings presented here, one can only conclude that EL programs do not appear to have a negative impact on student academic success.



Table 4.1 Academic Success by Program Type, Measure, Impact and Study Quality

Publication	EL Program	Outcome		Quality of Study
		Measure	Impact	
Alfeld et al. (2007)	Composite	GPA; Grade	None; Positive	med
Dykeman et al. (2003)	Composite	Other (English self-efficacy)	None	high
Kenney & Collet-Klingenberg (2000)	Apprenticeship	Grade (math, science)	Positive	low
Patrick (1999)	Composite	Test score (math, reading)	Positive	low
Plank (2001)	Composite	Test score (math, science, reading, history)	None	high
Stone & Aliaga (2005)	Composite	GPA	None	med
Swail et al. (2004)	Composite	GPA	Positive	high

### Psycho-social Outcomes

Eight studies report psycho-social outcomes for EL programs. The studies investigated composite EL programs (n=5), Work Experience (n=2), and Co-operative education (n=1). All studies, except for Zanibbi et al. (2006), report positive impacts. Zanibbi et al. (2006) is a case study with two students who had completely different experiences. One student reports very positive psycho-social outcomes the other very negative outcomes.

Overall the findings suggest that high school students who experienced any type of EL program demonstrate psycho-social benefits in terms of self-esteem, engagement in workplaces or schools, socialization and leadership, and motivation.

Table 4.2 Psycho-social by Program Type, Measure, Impact and Study Quality

Publication	EL Program	Outcome		Quality of Study
		Measure	Impact	
Alfeld et al. (2007)	Composite	Engagement, Motivation	Positive	Med
Bennett (2007)	Composite	Socialization and leadership	Positive	Low
Colorado Dept of Education (1999)	Composite	Motivation	Positive	Low
Hughes & Golann (2007)	Work Experience	Motivation	Positive	High
Mulraney et al. (2002)	Composite	Engagement, Socialization and leadership	Positive	Med
Noonan et al. (2007)	Composite	Self-esteem, engagement	Positive	High
Smith et al. (2001)	Work Experience	Engagement	Positive	Low
Zanibbi et al. (2006)	Co-operative	Engagement, Socialization and leadership, Motivation	Positive Negative	Med

### Graduation Outcomes

Seven studies examined the effect of EL programs on graduation outcomes. All report positive outcomes in terms of lowering the risk of student drop-out. Three studies (Stone & Aliaga, 2005; Plank, 2001; Patrick, 1999) found that CTE programs have significant effects on high school completion.

Although all the studies indicate a positive effect of EL programs on student retention and drop-out rates, it is important to note that more than half of these were deemed to be of low quality and thus their results need to be interpreted with caution. Still, if these results are considered alongside those for the psycho-social outcomes, it seems reasonable to assume that EL programs aid in retaining students since those students who tend to drop-out of school also tend to feel disengaged from, and less motivated in, school. Thus it is not unreasonable to infer that if students are feeling better about being at school, they are also less likely to be early leavers.

Table 4.3 Graduation by Program Type, Measure, Impact and Study Quality

Publication	EL Program	Outcome		Quality of Study
		Measure	Impact	
Finnan & Chasin (2007)	School-to-Work	Drop-out rates	Positive	Low
Kenney & Collet-Klingenberg (2000)	Apprenticeship	Absenteeism	Positive	Low
Patrick (1999)	Composite	Drop-out rates	Positive	Low
Plank (2001)	Composite	Drop-out rates	Positive	High
Stone & Aliaga (2005)	Composite	Graduation rate	Positive	Med
Swail & Kampits (2004)	Composite	Drop-out rates	Positive	High
Visher et al. (2004)	Composite	Graduation rates	Positive	Low

### Career Preparation

Because Career Preparation was examined as an outcome by almost all the studies included in this review, the results are presented under headings for three main outcome measures: Employment; Post Secondary Education; and Career Awareness.

#### Employment

Four studies report outcomes for the relationship between EL programs and employment rates and/or income level. While all the studies report positive relationships between various types of EL programs and future employment, Teitelbaum et al. (2002), after examining two different types of EL programs, found that co-op education showed no impact on employment. The authors also note a gender difference, stating that females appeared to benefit more than males from work experience programs.

Two studies, Levesque et al. (2008) and Teitelbaum et al. (2002) examined the relationship between income level and EL programs. Neither group of authors reported a significant positive or negative relationship between co-op programs involving *vocational training* and *income*, however both found positive correlations between *work experience* and *income*. It is unclear based on these two studies why a difference exists between high school work experience programs and more vocationally specific co-op programs. More research needs to be completed before any conclusive statements can be made.

Overall, taking into consideration the quality of the studies, experience in EL programs appears to have some impact on employment, although one's level of income does not appear to be influenced. It also appears to be the case that the types of EL experience may be a moderating factor. Further research and analysis is required before any conclusive statements can be formulated.

Table 4.4 Employment by Program Type, Measure, Impact and Study Quality

Publication	EL Program	Outcome		Quality of Study
		Measure	Impact	
Bumgraner et al. (2003)	Work Experience	Employment rate	Positive	Med
Levesque et al. (2000)	Composite	Employment rate	Positive	Med
Levesque et al. (2008)	Composite	Employment rate	Positive	Med
		Income	None	
Teitelbaum et al. (2002)	Work Experience	Employment rate	Positive	Med
	Co-operative Education		None	
	Work Experience	Income	Positive	
	Co-operative Education		Negative	

#### Post Secondary Education

Twelve studies examined the relationship between post secondary education (PSE) enrolment (or intent to enrol) and EL program experience. Results for this group of studies vary both in stated impacts and in quality. One third (i.e. four studies) of the studies found a negative, rather than neutral or positive, relationship between EL programs and future PSE experience. Since all these studies examined more than one type of EL program, it is difficult to determine what exactly influenced the negative results.

Some authors did investigate possible moderators and all drew generally similar conclusions. They point to student level characteristics, such as prior academic achievement and level of interest in PSE, as having a greater effect on whether or not a student goes on to PSE, rather than the EL program itself. For example, Stone & Aliaga (2005) report that students who concentrated on technical and vocational experiences were significantly less likely to aspire to a four-year degree than those who concentrated on academic paths. Plank (2001) also suggests that vocational students are more likely to seek work directly out of high school and are least likely to pursue PSE.

The remaining eight studies also examined various types of EL programs, however they all report a positive impact on PSE enrolment. Three of these studies were rated as being of high quality. It should be noted that none of the four studies reporting a negative impact were of low quality, but three of the eight studies stating a positive impact were assess as being low in quality.

Without more information about the variations among individual programs and more descriptive and detailed student level data, it is unwise to make statements about the relationships between EL programs in general and future PSE experiences.

There are too many factors that directly or indirectly affect students and their choices to pursue PSE. Making correlational statements based on the research presented here is ill-advised.

Table 4.5 Post Secondary Education by Program Type, Measure, Impact and Study Quality

Publication	EL Program	Outcome		Quality of Study
		Measure	Impact	
Alfeld et al. (2007)	Composite	PSE enrolment	Positive	Med
Bristow & Anderberg (1999)	Composite	PSE enrolment	Positive	Low
Colorado Dept of Education (1999)	Composite	PSE enrolment	Positive	Low
Hughes & Golann (2007)	Work Experience	PSE enrolment	Positive	High
Joyce & Neumark (2001)	Composite	PSE enrolment	Positive	Med
King et al. (2005)	Co-operative Education	PSE enrolment	Positive	High
Levesque et al. (2000)	Composite	PSE enrolment	Negative	Med
Levesque et al. (2008)	Composite	PSE enrolment	Negative	Med
Plank (2001)	Composite	PSE enrolment	Negative	High
Stone & Aliaga (2005)	Composite	PSE enrolment	Negative	Med
Swail & Cabrera (2004)	Composite	PSE enrolment	Positive	High
Visher et al. (2004)	Composite	PSE enrolment	Positive	Low

#### Career Awareness

Eighteen studies examining career awareness as an outcome of EL programs report positive effects. This is perhaps unsurprising given the general purpose of such programs is to expose youth to various careers and career paths. Although the quality of the studies vary, it is unlikely that increased career awareness would not be an outcome of EL programs.

Table 4.6 Career Awareness by Program Type, Measure, Impact and Study Quality

Publication	EL Program	Outcome		Quality of Study
	Category	Measure	Impact	
Alfeld et al. (2007)	Composite	Career Awareness	Positive	Med
Bennett (2007)	Composite	Career Awareness	Positive	Low
Billett (2007)	Work Experience	Career Awareness	Positive	Low
CMHF & Pfizer (2007)	Work Experience	Career Awareness	Positive	Low
Colorado Dept of Education (1999)	Composite	Career Awareness	Positive	Low
Cumming & Lesniak (2000)	Composite	Career Awareness	Positive	Low
Fawcett & Maycock (2001)	Composite	Career Awareness	Positive	Low
Gentry et al. (2005)	Composite	Career Awareness	Positive	Med
Hughes & Golann (2007)	Work Experience	Career Awareness	Positive	High
King et al. (2005)	Co-operative Ed.	Career Awareness	Positive	High
	Apprenticeship	Career Awareness	Positive	High
Mulraney et al. (2002)	Composite	Career Awareness	Positive	Med
Padula et al. (2002)	Composite	Career Awareness	Positive	Med
Philips et al. (2002)	School-to-Work	Career Awareness	Positive	Med
Smith et al. (2001)	Work Experience	Career Awareness	Positive	Low
Taylor (2003)	Work Experience	Career Awareness	Positive	Med
Valadez (2003)	Work Experience	Career Awareness	Positive	Med
Yan et al. (2005)	School-to-Work	Career Awareness	Positive	High
Zanibbi et al. (2006)	Co-operative Ed.	Career Awareness	Positive	Med

It is difficult to say with any certainty that the research evidence points to a positive relationship between experiential learning programs and overall career preparation since career preparation encompasses so many facets. It may be more practical to examine career preparation at the high school level solely in terms of career awareness and post-secondary *awareness* (rather than PSE *enrolment*). Post secondary awareness refers to students' understanding of what is required to move down a desired career path. This includes knowing where and how to access information about a chosen career and what is required to get there, even if it does not include further formal education. If EL programs were evaluated against these two main criteria then the measurement would include and represent all those students for whom formal post-secondary education is not required, and it is likely,

given the studies analyzed here, that EL programs' overall effect on career preparation would be positive.

#### 4.2 Student Characteristics

The Ministry indicated interest in various student level characteristics that may surface in relation to enrolment in EL programs. Although coding guidelines for a variety of demographic and other student characteristics were created, few authors actually disaggregated their results to this level and some neglected to report this information entirely. Thus the following analysis for student characteristics is purely descriptive at best and generally limited in the insight it can offer.

All 35 studies provided information on the number of participants involved in the study, but few provide any information about the sample at the student level. In 1987, the National Centre for Education Statistics (NCES) in the United States instituted a new approach to collecting and reporting data on career and technical education programs. Under this new approach, data were collected primarily through general-purpose surveys rather than separate questionnaires or studies. As a result, many researchers choose to use these easily accessible data sets and run secondary data analyses when investigating EL programs.

##### Sample age

The majority of the studies included in this review identify the student populations in terms of age or grade range, however there were no consistent ranges across studies. As a result it was not possible to analyze any of the results by individual age. All studies included students between the ages of 12 – 20, or included discussions about graduates who were between these ages at the time they were enrolled in an EL program.

##### Gender

As presented in Table 4.7, 22 studies (63%) provided information on the gender distribution of their sample. In two of the studies, over 75% of the subjects were female and one study was a single case study involving a male student. The remaining 13 studies did not specify the gender distribution of their samples.

Table 4.7 Gender Distributions

Attribute	Number
Boys and Girls	19
Over 75% female	2
Over 75% male	1
Gender breakdown not provided	13

Since no studies sought to investigate the types of EL programs that may attract one gender more than the other, the gender-based analysis is limited to the information provided in Table 4.8. It is perhaps notable that experience in EL programs, regardless of the type, appears to attract both girls and boys. Again, this is tempered

by the fact that the majority of the studies are from the USA and, as in Canada, some form of career exploration is usually part of the general curricula particularly at the high school level.

Table 4.8 Type of EL Program by Gender Distribution

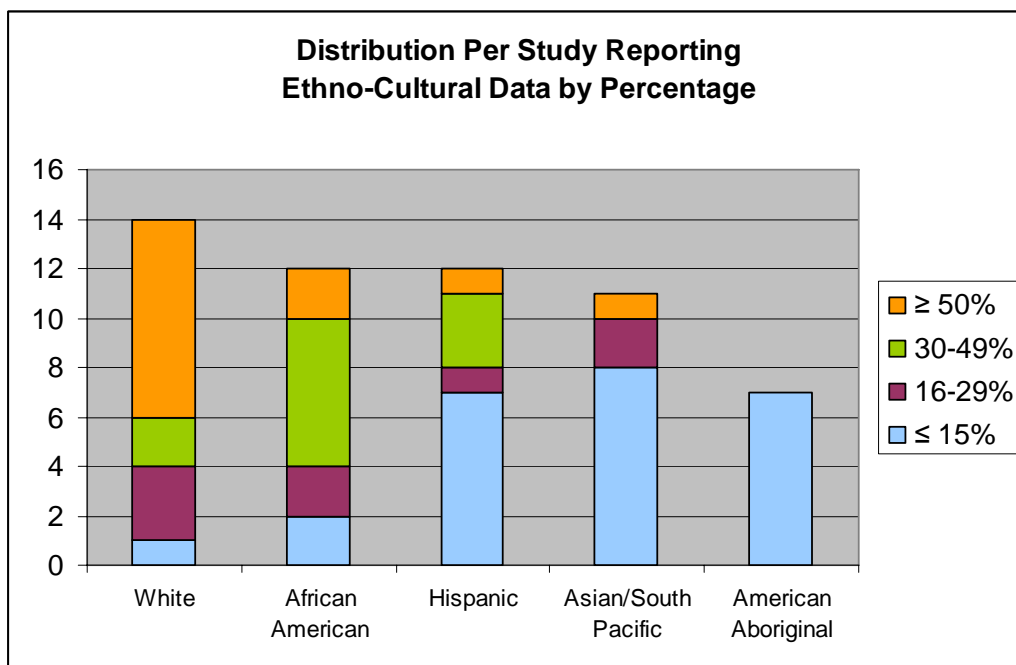
Type of EL Program	Boys & Girls	Mostly Boys	Mostly Girls	Not reported
School-to-Work (n=4)	2	1	0	1
Composite (n=20)	13	0	1	6
Co-op (n=3)	2	0	0	1
Work Experience (n=8)	2	0	1	5
Virtual Work Experience (n=1)	1	0	0	0
Apprenticeship (n=2)	1	0	0	1

**Ethno-cultural distributions**

Almost half of the studies (45%) did not report ethno-cultural information about their sample. Of the studies that did include such data, the majority reported using samples that include a range of ethno-cultural groups.

While most studies reported having a mixed ethno-cultural distribution, four studies reported having primarily White students; two studies included samples where African-American students made up more than half of the participants. Figure 4.1 presents the ethno-cultural distributions as reported in the studies.

Figure 4.1 Number of Studies Identifying Different Percentages of Various Ethno-Cultural Groups in the study





Again, since the majority of the studies took place in the United States, most samples included larger proportions of African-American and Hispanic students than are likely to be present in the Canadian context. Therefore any results that breakdown outcome by ethno-cultural group would be of limited applicability.

### **Other student characteristics**

Patrick (1999) used a very large sample of 11,766 students enrolled in CATE (career and technology education) courses during high school. While the author reported that 12% of these students were enrolled in Special Education programs and 39% were economically disadvantaged, no data were presented on these two demographic groups in relation to their participation in the programs and in relation to the impact of the programs.

Another study by Kenney & Collet-Klingenberg (2000) investigated an alternative education program for juniors and seniors who are not expected to graduate. This community-based Youth Apprenticeship (YA) program proved to be a creative solution for serving the needs of at-risk youth who were failing to succeed in the traditional school setting.

Two studies reported the inclusion of students eligible for bilingual education (Cumming & Lesniak, 2000; Bennett, 2007). These were the only commonalities in the groups of students who participated in the EL programs that we were able to identify. However, even if the authors provided such information in their reports, they didn't follow up on these characteristics in relation to the outcomes of the programs in which the students were involved.

Many studies investigated Career and Technology Education programs, some of which identified the participating students as being "at-risk" (Kenney & Collet-Klingenberg, 2000). Although it may be tempting to infer that the other studies also included at-risk populations, it would be dangerous to do so. Traditionally, vocational and technology programs frequently enrolled students who focused less on academics and more on practical learning experiences such as mechanics, carpentry, or metalwork. Since graduation requires the successful completion of a number of core academic courses, vocational and technology students were often seen as "at-risk" of not graduating. This trend is changing particularly since many vocational careers require more and more post-secondary education. Thus, although one might have initially associated CTE students with being students who are "at-risk", in today's circumstances this association is less likely to be reliable or accurate.

### **4.3 Barriers and Facilitators of Experiential Learning**

Studies were coded as having surveyed or interviewed students, parents, or employers in order to extract information pursuant to gaining insight into the factors that might facilitate or impede participation in EL programs. The following is a synthesis of the information garnered from those qualitative reports.

Table 4.9 is a list of the studies that gathered information about individuals' experiences and opinions about EL programs.

Table 4.9 Studies on Barriers and Facilitators for EL

Publication	EL Program Category	Outcome measure	Quality of Study
Mulroney et al. (2002)	Composite	Employer satisfaction/comment	Med
Levesque et al. (2000)	Composite		Med
Zanibbi et al. (2006)	Co-operative		Med
Smith et al. (2001)	Work Experience		Low
Cumming & Lesniak (2000)	Composite		Low
MacAllum & Charmer (2000)	School-to-Work		Low
Smith et al. (2001)	Work Experience	Student feedback	Low
Bristow & Anderberg (1999)	Composite		Low
Zanibbi et al. (2006)	Co-operative		Med
Joyce & Neumark (2001)	Composite		Med
MacAllum & Charner (2000)	School-to-Work		Parents satisfaction

### Barriers and Facilitators for Employers

Six studies included qualitative data garnered from employers involved with EL programs. Although only one study, Mularney et al. (2002), specifically investigated factors that facilitate and/or impede employers' participation in EL programs, general statements made by employers or a study's author revealed some common themes.

Mularney et al. (2002) note some specific advantages identified by employers included in their study. These benefits include exposure to potential employees; having an extra pair of hands to assist with the everyday workload; and fulfilling a sense of community obligation. Equally, while employers appreciated that they had a role to play in supporting young people, some also believed that the system of work placement was of greater benefit to the students and school than to their enterprise.

A number of employers addressed the issue of school-employer communication and their desire to have greater interactions with program coordinators. For instance, one employer participant stated: *"We've never had any feedback from the school and that makes you feel a little despondent ... we're putting ourselves out for the students and getting nothing back ... teachers should drop in ... so the students would see the link between what we do and what happens at school."* Other employers noted that they would have preferred more correspondence and a better introduction to the purposes of the exercise; for instance, how the experience was to

relate to the curriculum and what was expected of the employers. They wanted to have a better understanding of the program and their role within it.

Cumming and Lesniak (2000) and Smith et al. (2001) reported that students' unacceptable level of employment skills and lack of preparation for the workforce were major concerns for employers. Cumming and Lesniak (2000) suggested that this was due in part to a lack of student preparation on the part of teachers, noting that, according to a teacher survey, most teachers did not address employability skills in their classrooms.

In general, employers appear to be satisfied with the students' performance and wanted to continue to assist in their preparation for entrance into the workforce. However, several impeding factors were also acknowledged. These concerns did not focus solely on students but also included references to schools and program coordination. Some of the listed apprehensions included: (a) students' lack of employment skills; (b) inappropriate student placements; (c) lack of human resources in schools (coordinators); (d) disconnected curriculum from real job skills; (e) lack of time for employers to understand EL and the expectations of the program; and (f) lack of communication between schools and the participating business or workplace.

Overall, employers appear to be willing to participate in various work experience programs, although caveats were noted. Communication and involvement in the curriculum seemed to be important to the employers surveyed in these studies. Student preparation and school organization were also seen to be very important components of a positive experience on the part of employers.

### **Parents Perspectives**

Only one study, MacAllum & Charner (2000), examined parents' perspectives on EL programs. The analysis of the parent survey data found that they believe EL programs to be beneficial for their children. Most parents in this study (about 90%) considered the school-to-work initiative to be very helpful in supporting and guiding their child's decisions concerning future education and career choices. In this particular study, parents were said to have become more involved in their child's education as a result of the program. Furthermore, parents reported that the quality of the relationship between themselves and their children was enhanced.

Drawing generalized conclusions from one study is inadvisable. In short, while this study offers solely positive feedback on the part of parents, it is likely that other parents may be able to offer more critical appraisals and feedback about the EL programs in which their children are involved.

### **Barriers and Facilitators for Students**

A successful work experience placement for students relies on a number of factors. Access to EL programs, appropriate placement, and systematic and purposeful

structure to the learning experience in the workplace site are all important features that require consideration.

Issues of access may differ among students in rural settings versus those in urban settings. There may be fewer opportunities for rural students to engage in work experience or hands-on career exploration simply due to limited numbers of businesses located in rural settings. Another rural/urban difference is transportation. Rural students may find it more difficult to get to and from a work placement and home again if public transportation is limited and/or school-bus schedules do not fit within the required work-shift schedules of the business.

However, the studies included in this review reported mixed findings with regard to the rural-urban divide. Smith et al. (2001) investigated whether certain students find access to work experience opportunities more difficult than others. The authors found that work experience was an almost universal part of the school curriculum in Australia, with only special circumstances preventing participation. Interestingly this study found that rural schools appeared to offer a more flexible and tailor-made approaches to students in relation to work experience and vocational placements. The rural students did not have a lower participation rate in paid work than the metropolitan students. Conversely, American researchers Joyce & Neumark (2001) reported that rural schools are significantly less likely than urban and suburban schools to engage in work-based programs.

Appropriate workplace assignment seems to be an important facilitator of positive student experiences. Zanihi et al. (2006) used two extreme cases of work placement experiences to demonstrate the importance of interest-appropriate placements. The authors maintain that in addition to a structured and systematic approach to on-site training, the placement must fit the student's desire career path. Thus, as was the case in this study, assignment to a gym to improve people skills did not seem valuable to the student who wanted an eventual career in law enforcement.

Another access issue that may present a barrier to student's participation is conflicts between the times at which students are expected to be onsite at a work placement and other student commitments. If the student is expected to participate in an experiential learning activity outside of the regular school schedule, some students may already have prior family or community commitments, making it more difficult or impossible to take part in the program.

Little direct data in the form of students' responses were reported in the studies that surveyed students. Furthermore, only four studies offered any insight into the barriers or facilitator which may exist for students. It is therefore difficult to elucidate which factor(s) might assist in creating meaningful experiential opportunities for students and which may actual prevent those experiences. It seems reasonable to expect that issues of time, scheduling, transportation and

students' interest level are all factors that require consideration when attempting to identify barrier and facilitators to participation.

## 5.0 Conclusion and Discussion

As part of the Ministry's Student Success / Learning to 18 initiative, experiential learning (EL) programs such as the *Specialist High Skills Majors (SHSM)* have been created, and Co-operative Education programs have been expanded. These programs are designed to challenge and engage students regardless of their academic standing. Although these types of preparatory programs have existed for some time, important equity issues raised and recommendations made in the King (2005) Double Cohort report focused new attention on them. In his report, King noted that schools ought to meet the needs of all students, supporting their interests and future ambitions to the best of the school's ability. It is unacceptable that some youngsters feel they have no other option but to leave school early, without graduating, because the curriculum and education-related opportunities do not match their interests. All students need options that help prepare them for life after high school.

Preparation includes not only academic preparation but also career preparation. Many programs are designed to expose students to the workforce, and to assist in their development of important life-skills which will allow them to become successful employees and/or employers in the future. A successful transition from school to work is paramount not only for the wellbeing of the student, but also for society as a whole. Disenchanted or disaffected young people encounter undue hardships as they manoeuvre along life's pathway. It is in all our interests to ensure young people are provided with an opportunity to identify and engage in interesting and positive work experiences prior to leaving high school.

Equally important is the need to identify those factors that facilitate and impede the success of such programs. While good intentions are admirable, they do not necessarily result in the outcomes desired. It is therefore important to determine what makes a given intervention effective, and where adjustments may be needed. Fortunately, quality research can provide insights into what works, for whom, and under what conditions. The purpose of this review was to capture a sample of the current research literature devoted to exploring student level outcomes of EL programs and the factors that may impede or facilitate successful experiences on the part of employers, parents, and students.

Time and resource restrictions did not permit a complete and comprehensive review of the topic. Such enterprises normally take between eight and 18 months to complete. This review was limited to roughly two months. Within this context, CCL was able to capture and screen over 500 articles, eventually narrowing the list to 35 studies for coding and synthesis. It is without question that more time and resources would have permitted a deeper and more comprehensive analysis of the literature. The diversity and heterogeneity of the research did not lend itself well to synthesis of the overarching themes and results. Still, some results did emerge.

The main outcome of interest for researchers who engaged in exploring the effects of EL programs on students was “career preparation” (30 of 35 studies). This is, of course, unsurprising given the general purpose of such programs. Regardless of program type or the quality of the study, when career awareness was used as a measure of career preparation, all results were positive. Thus, it is safe to say that EL programs meet this very basic but important student outcome. As noted in the Results section, it is difficult to say with any certainty that the research evidence points to a positive relationship between EL programs and overall career preparation since career preparation encompasses so many facets. In particular, using post-secondary enrolment as a measurement outcome can be misleading since some students have had no intention of attending PSE. A positive outcome for these students may consist of gaining an understanding of what is required to move along a desired career path. This includes knowing where and how to access information about a chosen career and what is required to get there; even if it does not include further formal education. If EL programs were to be evaluated against these two main criteria, then the measurement would include and represent all those students for whom formal post-secondary education is not required, and it is likely, given the studies analyzed here, that EL programs’ overall effect on career preparation would be very positive.

This review found no conclusive evidence that EL programs promote increases in academic achievement. The studies varied on program type, measurement tools, outcomes and quality. It is likely that moderator variables, such as prior academic achievement or the type of outcome measure (GPA versus test scores, etc.), have an effect on overall results. A further review of research strictly devoted to academic achievement may reveal more unequivocal results, but the results here cannot.

Experiential learning had a positive impact on graduation. Although increased school retention does not necessarily lead to improved academic outcomes, improved academic outcomes cannot be achieved if student do not stay in school. It is our view that, when these findings are considered in conjunction with the positive effects reported for students’ psycho-social wellbeing, a strong case can be made that EL programs are beneficial for students and especially for students who may be at-risk of dropping-out. Our thinking is that, since psycho-social wellbeing is reflected in students’ engagement and motivation, it seems reasonable to suggest that as a student’s wellbeing increases, the likelihood of school disengagement and the possibly of dropping-out of school decreases.

Employer and parent perspectives about EL programs were also investigated in this review. With regard to parents, little insight can be offered. Only one study sought to gather parental information and as such, no conclusions can be drawn through this review. Data extracted from interviews or surveys with employers, however, were reported in six studies and resulted in the following conclusions being drawn.

In general, employers were happy to participate in EL programs, and enjoyed the sense of community commitment. They enjoyed being able to support young people

in their preparation for the workforce, they found having exposure to possible future employees beneficial. Still, there were a number of concerns raised by employers. Students' lack of preparation and employment skills was problematic for some employers. There was a feeling that the curriculum was not preparing students for the expectations of the workplace and that more attention should be given to pre-placement instructions. Inappropriate placements for young people was another common concern since they can lead to unpleasant or negative experiences for both parties. Lastly, many employers mentioned a lack of communication between the school or program coordinator and the employer as a major limitation. Employers sought more information and interaction with the schools in order to better understand the purpose and desired outcomes of the program and their role within it.

### **Further Considerations**

EL programs that seek to prepare young people for life after high school are beneficial for students and for employers; however there is always room for improvement. Based on the results of this review, those looking to improve or modify existing programs may wish to consider the following:

1. When students are not interested in the career path associated with the placement, they may not want to be there. As a result, employers feel they are wasting scarce resources and time, and become disenchanted by the experience. Thus, placement for placement's sake is not advisable.
2. Care needs to be taken when matching students to placements. Experiential learning is purposeful in that it is meant to raise the interest of young people and maintain and encourage further engagement in the community and in the workforce. Inappropriate placements, or placement for placement's sake, may, in fact, hinder this goal.
3. Communication and involvement in the curriculum seemed to be an important component of EL programs for employers. The creation of specific Program Coordinator positions will allow ongoing and strong relationships to be built with employers in the community. Program Coordinators can deliver employer orientations and information sessions explaining the role of the employer, the structure, curriculum design, and goals of the program. They can work with employers to ensure the on-site learning experience is structured and systematically builds on both curricular content and prior experiences. The experiences need to be positive for both the students and the employers. A dedicated coordinator who oversees all aspects of the program is fundamental to the success of these programs.
4. The literature reviewed contained scant information about employer expectations. However, it appears that some employers see work experience programs primarily in terms of the contribution that the students' make to the business in which they are engaged rather than as a learning opportunity



for the student. A successful work experience placement must achieve a balance between these incommensurate objectives. Disappointment on the part of both employers and students might be avoided if both parties are oriented to the expectations that each holds. Consideration might be given to developing communication strategies to convey such information and a 'contract' between the employer and the student that sets out reasonable expectations for each party.

5. Students must be well prepared. Although part of the intent of experiential learning programs is to expose students to career and life experiences not necessarily found in the school setting, certain skill sets and behaviours are expected to be present prior to entering the experiential setting. Students must bring with them a level of preparation that is congruent with the setting in which they will be a part and the expectations of the employer. Well prepared students will feel more comfortable and confident, as will the employers.

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## Appendix 1 Quality Evaluation Rubric

### Study Description: Questions 1-5

Authors	Do the authors describe the "Experiential Learning Program" that was explored/ investigated in the study?	Do the authors report how the study was funded?	Do the authors report when the study was carried out?	Do the authors report where (country, area, school, etc.) the study was carried out?	Are the aims/ questions/hypotheses of the study clearly reported?
Alfeld et al. 2007	1	0	1	1	1
King et al. 2005	1	1	1	1	1
Bennett 2007	0	0	1	1	1
Billett 2007	0	0	1	1	1
Bristow & Anderberg 1999	0	0	1	1	1
Bumgarner 2003	1	1	1	1	1
Canadian Medical Hall of Fame & Pfizer Canada 2007	1	1	1	1	1
Colorado Dept. of Ed. 1999	0	0	0	1	1
Cumming & Lasniak 2000	1	0	0	1	1
Dykeman et al. 2003	1	0	1	1	1
Fawcett & Maycock 2001	1	0	0	0	0
Finnan & Chasin 2007	1	0	1	0	0

Authors	Do the authors describe the "Experiential Learning Program" that was explored/ investigated in the study?	Do the authors report how the study was funded?	Do the authors report when the study was carried out?	Do the authors report where (country, area, school, etc.) the study was carried out?	Are the aims/ questions/hypotheses of the study clearly reported?
Gentry et al. 2007	1	0	1	1	1
Gentry et al. 2005	1	0	0	1	1
Hughes et al. 2007	1	1	1	1	1
Joyce & Neumark 2001	1	0	1	1	1
Kenney & Collet-Kilingenberg 2000	1	1	1	1	0
Levesque et al. 2008	1	0	1	1	1
Levesque et al. 2000	1	0	1	1	1
MacAllum & Charner 2000	1	0	1	1	0
Mulraney et al. 2002	1	1	1	1	1
Noonan et al. 2007	1	1	0	1	1
Padula et al. 2002	1	1	0	1	1
Patrick 1999	1	1	1	1	0
Phillips et al. 2002	0	0	0	1	1
Plank 2001	1	1	1	1	1
Smith et al. 2001	0	1	0	1	1

Authors	Do the authors describe the "Experiential Learning Program" that was explored/ investigated in the study?	Do the authors report how the study was funded?	Do the authors report when the study was carried out?	Do the authors report where (country, area, school, etc.) the study was carried out?	Are the aims/ questions/hypotheses of the study clearly reported?
Stone et al. 2005	1	0	1	1	1
Swail & Kampits 2004	1	1	1	1	1
Taylor 2003	1	1	1	1	1
Teitelbaum et al. 2002	0	0	1	1	1
Valadez 2003	1	0	1	1	1
Visher et al. 2004	0	0	1	1	1
Yan et al. 2005	1	0	1	1	1
Zanibbi et al. 2006	1	1	1	1	1



**Sample and Data collection: Questions 6-10**

Author	Do the authors report the age/grade of the sample?	Do the authors report the gender / ethnicity of the sample?	Do the authors report how the sample was collected or identified and recruited?	Is there an adequate description of the methods of data analysis?	Is the study replicable from this report considering data collection and analysis method?
Alfeld et al. 2007	0	1	1	1	1
King et al. 2005	1	1	1	1	1
Bennett 2007	0	1	1	1	1
Billett 2007	0	0	1	0	1
Bristow & Anderberg 1999	0	0	1	0	0
Bumgarner 2003	0	0	1	1	1
Canadian Medical Hall of Fame & Pfizer Canada 2007	0	0	1	0	1
Colorado Dept. of Ed. 1999	1	1	1	0	0
Cumming & Lasniak 2000	0	1	1	0	1
Dykeman et al. 2003	1	1	1	1	1
Fawcett & Maycock 2001	1	1	0	1	1
Finnan & Chasin 2007	1	1	1	1	1
Gentry et al. 2007	1	1	1	1	1
Gentry et al. 2005	1	0	1	1	1

Author	Do the authors report the age/grade of the sample?	Do the authors report the gender / ethnicity of the sample?	Do the authors report how the sample was collected or identified and recruited?	Is there an adequate description of the methods of data analysis?	Is the study replicable from this report considering data collection and analysis method?
Hughes et al. 2007	0	1	1	1	1
Joyce & Neumark 2001	1	1	1	1	1
Kenney & Collet-Kilingenberg 2000	0	0	1	0	1
Levesque et al. 2008	1	1	1	1	1
Levesque et al. 2000	1	1	1	1	1
MacAllum & Charner 2000	0	0	1	0	0
Mulroney et al. 2002	1	0	1	0	1
Noonan et al. 2007	1	1	1	1	1
Padula et al. 2002	1	1	1	0	1
Patrick 1999	0	1	1	0	1
Phillips et al. 2002	1	1	1	1	1
Plank 2001	1	1	1	1	1
Smith et al. 2001	1	0	0	0	0
Stone et al. 2005	1	0	1	1	1
Swail & Kampits 2004	1	1	1	1	1

Author	Do the authors report the age/grade of the sample?	Do the authors report the gender / ethnicity of the sample?	Do the authors report how the sample was collected or identified and recruited?	Is there an adequate description of the methods of data analysis?	Is the study replicable from this report considering data collection and analysis method?
Taylor 2003	1	1	1	1	1
Teitelbaum et al. 2002	0	1	1	1	1
Valadez 2003	1	1	1	1	1
Visher et al. 2004	1	0	1	0	0
Yan et al. 2005	1	1	1	1	1
Zanibbi et al. 2006	1	1	1	1	0

**Reporting and Reliability: Questions 11-16**

Author	Do the authors avoid selective reporting bias? (e.g. do they report on all variables they aimed to study as specified in their aims/research questions)	Do the authors take any procedures to avoid ethical concerns about the way the study was done in relation to consent, funding, privacy, etc?	Is there any justification for why the study was done the way it was?	Have any attempts been made to establish the reliability of data collection methods and tools by addressing the reliability of their data tools/methods?	Have any attempts been made to establish the reliability of data collection methods and tools by addressing the validity of their data tools/methods?	Do the authors describe any possible error/bias which would lead to alternative explanations for the findings of the study?
Alfeld et al. 2007	1	1	1	1	0	0
King et al. 2005	1	1	1	1	1	0
Bennett 2007	1	1	0	0	0	0
Billett 2007	1	1	1	0	0	1
Bristow & Anderberg 1999	0	1	1	0	0	0
Bumgarner 2003	1	1	1	0	0	0
Canadian Medical Hall of Fame & Pfizer Canada 2007	0	0	0	0	0	0
Colorado Dept. of Ed. 1999	0	1	0	0	0	0

Author	Do the authors avoid selective reporting bias? (e.g. do they report on all variables they aimed to study as specified in their aims/research questions)	Do the authors take any procedures to avoid ethical concerns about the way the study was done in relation to consent, funding, privacy, etc?	Is there any justification for why the study was done the way it was?	Have any attempts been made to establish the reliability of data collection methods and tools by addressing the reliability of their data tools/methods?	Have any attempts been made to establish the reliability of data collection methods and tools by addressing the validity of their data tools/methods?	Do the authors describe any possible error/bias which would lead to alternative explanations for the findings of the study?
Cumming & Lasniak 2000	0	0	1	0	0	0
Dykeman et al. 2003	1	1	1	0	0	1
Fawcett & Maycock 2001	1	1	0	1	1	0
Finnan & Chasin 2007	0	1	0	0	0	0
Gentry et al. 2007	1	1	1	0	0	0
Gentry et al. 2005	1	1	1	0	0	1
Hughes et al. 2007	1	1	1	0	0	1
Joyce & Neumark 2001	1	1	0	0	0	1
Kenney & Collet-Kilingenberg 2000	0	1	0	0	0	0
Levesque et al. 2008	1	0	0	0	0	0

Author	Do the authors avoid selective reporting bias? (e.g. do they report on all variables they aimed to study as specified in their aims/research questions)	Do the authors take any procedures to avoid ethical concerns about the way the study was done in relation to consent, funding, privacy, etc?	Is there any justification for why the study was done the way it was?	Have any attempts been made to establish the reliability of data collection methods and tools by addressing the reliability of their data tools/methods?	Have any attempts been made to establish the reliability of data collection methods and tools by addressing the validity of their data tools/methods?	Do the authors describe any possible error/bias which would lead to alternative explanations for the findings of the study?
Levesque et al. 2000	1	0	0	0	0	0
MacAllum & Charner 2000	0	0	0	0	0	0
Mulraney et al. 2002	1	0	1	0	0	0
Noonan et al. 2007	1	1	1	1	1	1
Padula et al. 2002	1	0	1	0	0	1
Patrick 1999	0	0	0	0	0	0
Phillips et al. 2002	1	1	1	0	1	1
Plank 2001	1	0	1	0	0	1
Smith et al. 2001	1	0	0	0	0	0
Stone et al. 2005	1	0	1	0	0	1
Swail & Kampits 2004	1	0	1	0	0	1
Taylor 2003	1	0	1	0	0	0

Author	Do the authors avoid selective reporting bias? (e.g. do they report on all variables they aimed to study as specified in their aims/research questions)	Do the authors take any procedures to avoid ethical concerns about the way the study was done in relation to consent, funding, privacy, etc?	Is there any justification for why the study was done the way it was?	Have any attempts been made to establish the reliability of data collection methods and tools by addressing the reliability of their data tools/methods?	Have any attempts been made to establish the reliability of data collection methods and tools by addressing the validity of their data tools/methods?	Do the authors describe any possible error/bias which would lead to alternative explanations for the findings of the study?
Teitelbaum et al. 2002	1	0	1	1	0	1
Valadez 2003	1	0	1	0	0	0
Visher et al. 2004	0	0	0	0	0	0
Yan et al. 2005	1	0	1	1	1	0
Zanibbi et al. 2006	1	0	1	0	0	0