College Sector Committee

TOWES Data Analysis

TOWES Baseline Testing

PROJECT FINDINGS

June 2008

Prepared By:

Bow Valley College
332-6 Ave S.E.
Calgary, Alberta
T2G 4S6

Tel: (403) 410-3200 Fax: (403) 297-4070
e-mail: towes@bowvalleycollege.ca

Bow Valley College
332 – 6 Avenue SE
Calgary, Alberta T2G 4S6
Phone: (403) 410-3200
Fax: (403) 297-4070
towes@bowvalleycollege.ca

Contents

PURPOSE 2

TOWES TEST 2

SCORING 3

TOWES TESTING & DATA COLLECTION 5

- TOWES TEST ADMINISTRATION 5
- DEMOGRAPHICS 5
- TEST RESULTS 6

SAMPLE SIZE LIMITATIONS 6

STATISTICAL PROJECT FINDINGS

PARTICIPANT DEMOGRAPHICS 7

PARTICIPATING COLLEGE DEMOGRAPHICS 14

TOWES SCORES 15

APPENDIX 1 – SUMMARY STATISTICS 23

APPENDIX 2 – LEVEL DEFINITIONS 24

Purpose

This report provides the College Sector Committee with the demographic data and TOWES test results for participants of the TOWES Baseline Testing portion of the Learner Skill Attainment Framework Initiative in Ontario. Participants from colleges across Ontario were approximately half way through the adult upgrading program ACE (Academic and Career Entrance) and completed TOWES assessments in either a paper or online format. TOWES was approached by the College Sector Committee to provide an analysis of participant demographics in comparison to TOWES scores.

TOWES Test

The Test of Workplace Essential Skills (TOWES) is a competency-based test that uses problem sets and authentic workplace documents to assess Essential Skills proficiencies in three domains: Reading Text, Document Use, and Numeracy.

Reading Text - includes written information contained within notes, letters, memos, manuals, specifications, regulations, reports and journals. This includes forms and labels, print and non-print media (for example, text on a computer screen), and paragraph-length text found in charts, tables and graphs.

Document Use – includes data presented in lists and tables and in visual displays such as icons, scale drawings, maps and schematics. This includes all materials in which words, numbers, icons and other visual characteristics (lines, colours and shapes) are organized within tables and lists or given meaning by their spatial arrangements.

Numeracy - includes numerical information and calculations involving money math, scheduling, budgeting and accounting math, measurement and calculation, data analysis and numerical estimation.

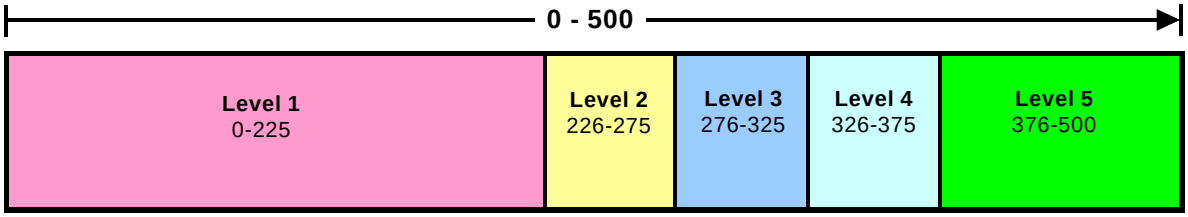
The TOWES General Series Level 2 test was used for this project in a paper and online format. This particular series assess skill levels 1 – 4, but most accurately measures skill levels 2 and 3 (standard error 0.04 or less). The test does not assess skills above level 4. The paper test contains 18 problem sets with a total of 70 questions. The online version varies slightly with 19 problem sets and 63 questions. Each question requires the test taker to assume the role of a worker in various occupational settings common to the workplace.

TOWES is a preferred measure of workplace literacy skills when compared with conventional assessments because:

- Standardized achievement tests tend to be created for children in school, not adults.
- School-based tests look backward to the academic curriculum and miss workplace topics such as document use.
- Adult tests of basic skills generally reflect a community rather than a workplace-based context.
- Workplace tasks are not normed to grade level equivalents.

Scoring

TOWES test results report on both the IALS (International Adult Literacy Survey)[1] 500-point scale and the ESRP (Essential Skills Research Project)[2] 5-Level scale used for occupational profiles developed by HRSDC (Human Resources and Skills Development Canada). On the IALS 0-500-point scale, complexity is measured 0 to 500 with 500 being most complex. On the ESRP 5-level scale, complexity is measured from 1 to 5 with 5 being most complex. The relationship between both scales is presented below.



A test taker is assigned a score at a given level when they can demonstrate an 80 percent (or higher) proficiency at completing questions at a given level. In other words, an individual will be classified at level 3 if they demonstrate an 80 percent (or higher) pass rate on questions rated at level 3. The 80 percent pass rate was selected as the required proficiency level because an 80 percent proficiency level was the standard established by IALS, and most workplaces require a similar standard of proficiency.

[1] Statistics Canada. (2003). Building on our Competencies: Canadian Results of the International Adult Literacy and Skills Survey (Catalogue no. 89-617-XIE). Ottawa, Ontario: Canada.

[2] Human Resoucres & Social Development Canada (2007). Essential Skills Research Project. Retrieved May 30, 2008, from: http://www.hrsdc.gc.ca/en/workplaceskills/publications/essential_skills/esrpfc.shtml

TOWES test results are standardized, as such, the following assumptions can be made about scores:

- Individuals with scores at level 4 can accurately complete TOWES questions rated at level 1, 2, 3, and 4, at the required proficiency rate of 80 percent or higher.
- Individuals with scores at level 3 can accurately complete TOWES questions rated at Level 1, 2, and 3, at the required proficiency rate of 80 percent or higher. They may be able to complete questions with complexities rated at 4 or higher, however not at the required 80 percent proficiency rate.
- Individuals with scores at level 2 can accurately complete TOWES questions rated at Level 1 and 2 at the required proficiency rate of 80 percent or higher. They may be able to complete questions with complexities rated at 3 or higher, however not at the required 80 percent proficiency rate.
- Individuals with scores at level 1 can accurately complete TOWES questions rated at Level 1 at the required proficiency rate of 80 percent or higher. They may be able to complete questions with complexities rated at 2 or higher, however not at the required 80 percent proficiency rate.

For this project, mean level scores were derived by converting mean IALS 500-point scores relative to the ESRP 5 Level scale, using the conversion table presented below:

IALS Score	LEVEL	IALS Score	LEVEL	IALS Score	LEVEL	IALS Score	LEVEL
176	1.80	226	2.0	276	3.0	326	4.0
181	1.82	231	2.1	281	3.1	331	4.1
186	1.84	236	2.2	286	3.2	336	4.2
191	1.86	241	2.3	291	3.3	341	4.3
196	1.88	246	2.4	296	3.4	346	4.4
201	1.90	251	2.5	301	3.5	351	4.5
206	1.92	256	2.6	306	3.6	356	4.6
211	1.94	261	2.7	311	3.7	361	4.7
216	1.96	266	2.8	316	3.8	366	4.8
221	1.98	271	2.9	321	3.9	371	4.9

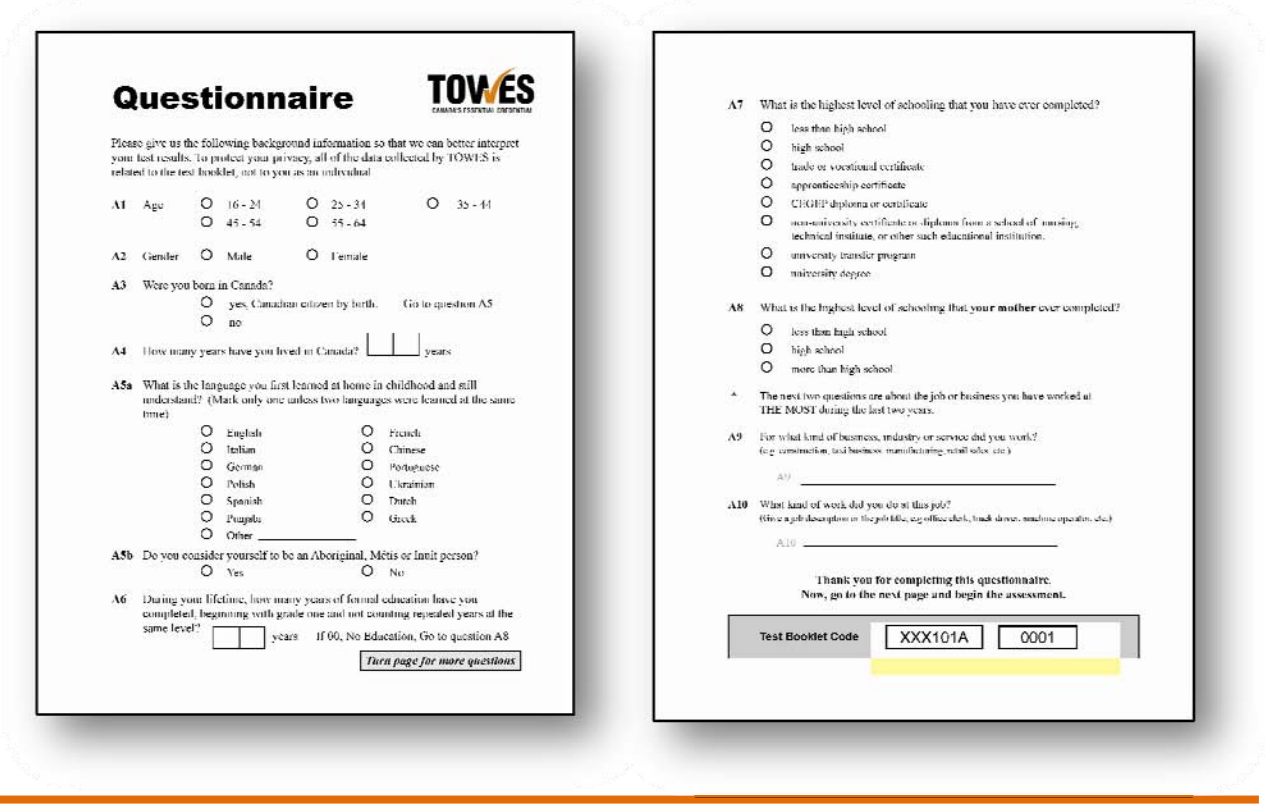
TOWES Testing & Data Collection

TOWES Test Administration

As TOWES is a formal, invigilated standardized assessment, it is important that the proper test administration procedures and protocols are followed. Only certified TOWES Test Administrators may invigilate the assessment. This is to ensure all test takers across the country, receive the same quality of testing instruction and that fair and equitable testing practices are maintained at all times. Numerous staff members at each participating Ontario College were certified TOWES Test Administrators. Staff that had requested to use the online pilot version of TOWES participated in additional test administration training prior to their scheduled testing sessions.

Demographics

The demographics of 95 participants were collected through the TOWES questionnaire, located at the beginning of each test booklet. Participants are encouraged to respond to each questionnaire item as accurately as possible, with the understanding that data collected is for research purposes only and will never be directly associated to them. Information collected remains confidential and may only be accessed by TOWES. Completing the TOWES questionnaire is not mandatory for participants to receive test results.



Questionnaire

TOWES

Please give us the following background information so that we can better interpret your test results. To protect your privacy, all of the data collected by TOWES is related to the test booklet, not to you as an individual.

A1 Age ○ 16 - 24 ○ 25 - 34 ○ 35 - 44 ○ 45 - 54 ○ 55 - 64

A2 Gender ○ Male ○ Female

A3 Were you born in Canada?
○ yes, Canadian citizen by birth. Go to question A5
○ no

A4 How many years have you lived in Canada? ☐☐ years

A5a What is the language you first learned at home in childhood and still understand? (Mark only one unless two languages were learned at the same time)
○ English ○ French
○ Italian ○ Chinese
○ German ○ Portuguese
○ Polish ○ Ukrainian
○ Spanish ○ Dutch
○ Punjabi ○ Greek
○ Other _____

A5b Do you consider yourself to be an Aboriginal, Métis or Inuit person?
○ Yes ○ No

A6 During your lifetime, how many years of formal education have you completed, beginning with grade one and not counting repeated years at the same level? ☐☐ years If 00, No Education, Go to question A8

Turn page for more questions

A7 What is the highest level of schooling that you have ever completed?
○ less than high school
○ high school
○ trade or vocational certificate
○ apprenticeship certificate
○ CEGEP diploma or certificate
○ non-university certificate or diploma from a school of nursing, technical institute, or other such educational institution.
○ university transfer program
○ university degree

A8 What is the highest level of schooling that your mother ever completed?
○ less than high school
○ high school
○ more than high school

^ The next two questions are about the job or business you have worked at THE MOST during the last two years.

A9 For what kind of business, industry or service did you work?
(e.g. construction, taxi business, manufacturing, retail sales, etc.)
A9) _____

A10 What kind of work did you do at this job?
(Give a job description or the job title, eg office clerk, truck driver, machine operator, etc.)
A10 _____

Thank you for completing this questionnaire.
Now, go to the next page and begin the assessment.

Test Booklet Code XXX101A 0001

Test Results

TOWES test results for each participant were compiled in association with the collected demographics. This enables TOWES to look for common themes and trends among the entire participant group as well as select population groups. Demographic information along with the corresponding test results and are not distributed individually, but as a group, to ensure results and personal information remains anonymous.

Sample Size Limitations

Many researchers strive for sufficient sample sizes to result in confidence levels of 95% and margins of error of +/-5%. These parameters ensure significant results that can be used to generalize to the population and to make data driven decisions and recommendations. Confidence levels and margins of error are largely dictated by sample sizes which include the overall size of the population and the size of the sample population.

To determine actual confidence levels and margins of error for this project, the number of ACE (Academic and Career Entrance) participant numbers for 2006/2007 were used for the overall size of the population and the actual number of participants was used as the sample size.

For the overall size of the population, the figure of 5,895 was used. In 2006/2007, College Sector Committee reported that 5,895 participants were enrolled in the ACE program. As more recent statistics are not available, a figure of 5,895 is deemed reasonable.

Using the estimate of 5,895 for overall population size, a random sampling of 361 participants is necessary to achieve the strived-for confidence level of 95% and a margin of error of +/-5%. As this study's maximum sample size is 95, our findings do not fall within the desired confidence level of 95% and margin of error of +/-5 % .

As a result, caution should be exercised when making generalizations about ACE participants based on the findings from this analysis. The degree of caution to be exercised increases as sample sizes decrease, which is the case when this study's population is segmented by factors such as age, grade, and mother tongue.

We note data results that do not achieve a confidence level of 95% and a margin of error greater than +/-5% by placing an " * " beside the number. All results that are derived using sample sizes of <361 have this marker.

Statistical Project Findings

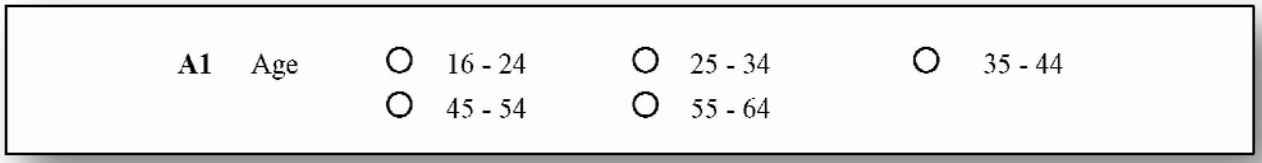
Participant Demographics

A total of 95 TOWES tests were completed with 75 of those tests in paper format. Twenty TOWES assessments were completed with a new pilot version of TOWES Online.

Demographics were collected through the TOWES questionnaire, located at the beginning of each test booklet. Participants are encouraged to respond to each questionnaire item as accurately as possible, with the understanding that data collected will never be directly associated to names or test booklet numbers. Completion of the TOWES questionnaire does not affect test results in any way.

Participation by Age

Participants were asked to self-identify the following:



Of the 91 participants who responded, 56 percent are between the Ages of 16-24, 15 percent are 25-34, 17 percent are 35-44, and 12 percent are 45 and older. Four participants did not identify Age.

Participation by Age				
Total Participants	**16-24**	**25-34**	**35-44**	**45 +**
91	51	14	15	11

Participation by Gender

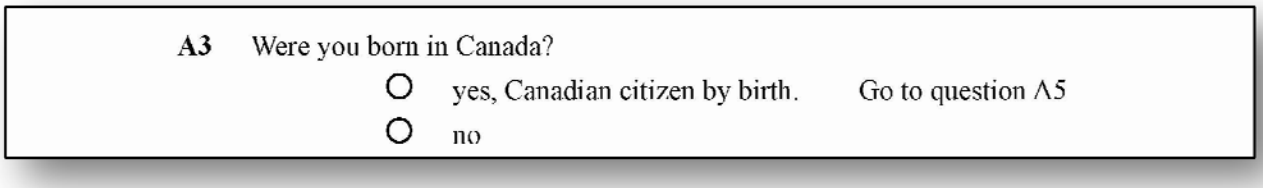
Participants were asked to self-identify the following:

Of the 90 participants who responded, 47 percent are female and 53 percent are male. Five participants did not indicate Gender.

Participation by Gender		
Total Participants	**Female**	**Male**
90	42	48

Participation by Born in Canada

Participants were asked to self-identify the following:

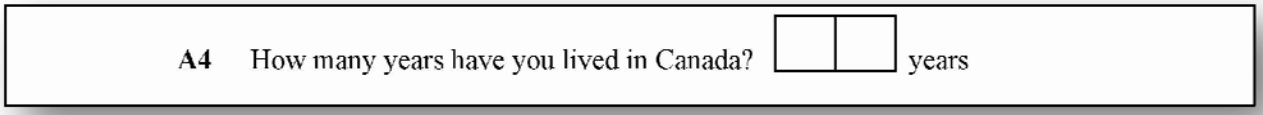


Of the 92 participants who responded, 78 percent were born in Canada and 22 percent of participants indicated they were born outside of Canada. Three participants did not indicate where they were born.

Participation by Born In Canada		
Total Participants	**Born In Canada**	**Born Outside of Canada**
92	72	20

Participation by Years in Canada

Participants were asked to self-identify the following:

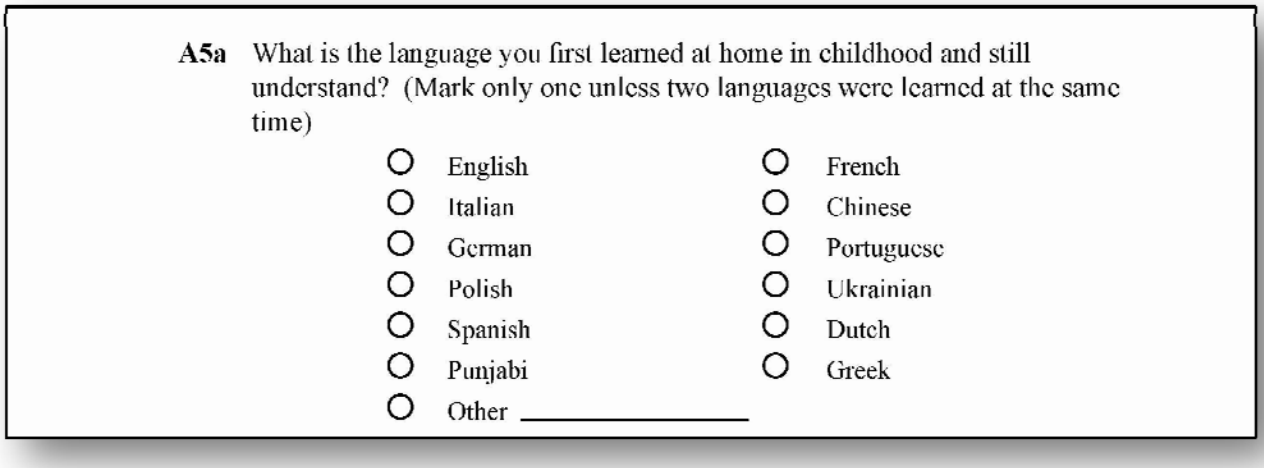


Of the 20 participants who responded, 50 percent were in Canada ten years or less. Years in Canada averaged at 10 ½ years, ranging from six months to 22 years.

Participation by Years in Canada			
Total Participants	**≤ 5 Years**	**6 – 10 Years**	**≥11 Years**
20	5	5	10

Participation by First Language

Participants were asked to self-identify the following:



A5a What is the language you first learned at home in childhood and still understand? (Mark only one unless two languages were learned at the same time)

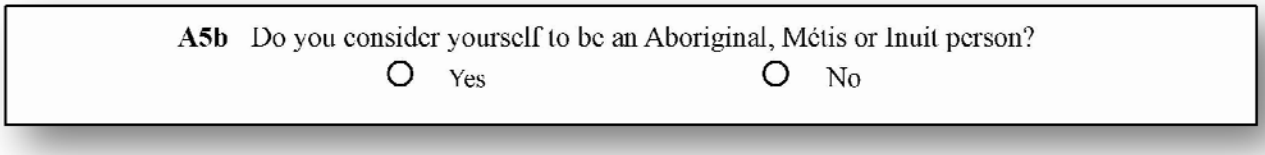
- ○ English
- ○ Italian
- ○ German
- ○ Polish
- ○ Spanish
- ○ Punjabi
- ○ Other _____
- ○ French
- ○ Chinese
- ○ Portuguese
- ○ Ukrainian
- ○ Dutch
- ○ Greek

Of the 81 participants who responded, 73 percent selected English only, six percent selected English in addition to another language (commonly French). Twenty-one percent of participates indicated 'other' language, with 18 percent selecting Arabic. Fourteen participants did not indicate First Language.

Participation by First Language			
Total Participants	**English**	**English + Other**	**Other**
81	59	5	17

Participation by Aboriginal, Métis or Inuit Person

Participants were asked to self-identify the following:

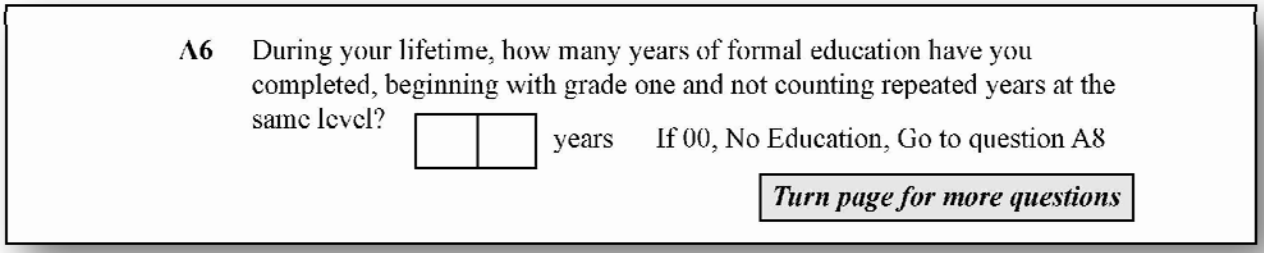


Of the 92 participants who responded, nine percent were Aboriginal, Métis or Inuit. Three participants did not identify.

Participation by Aboriginal, Métis or Inuit Person		
Total Participants	**Yes**	**No**
92	8	84

Participation by Years of Formal Education Completed

Participants were asked to self-identify the following:

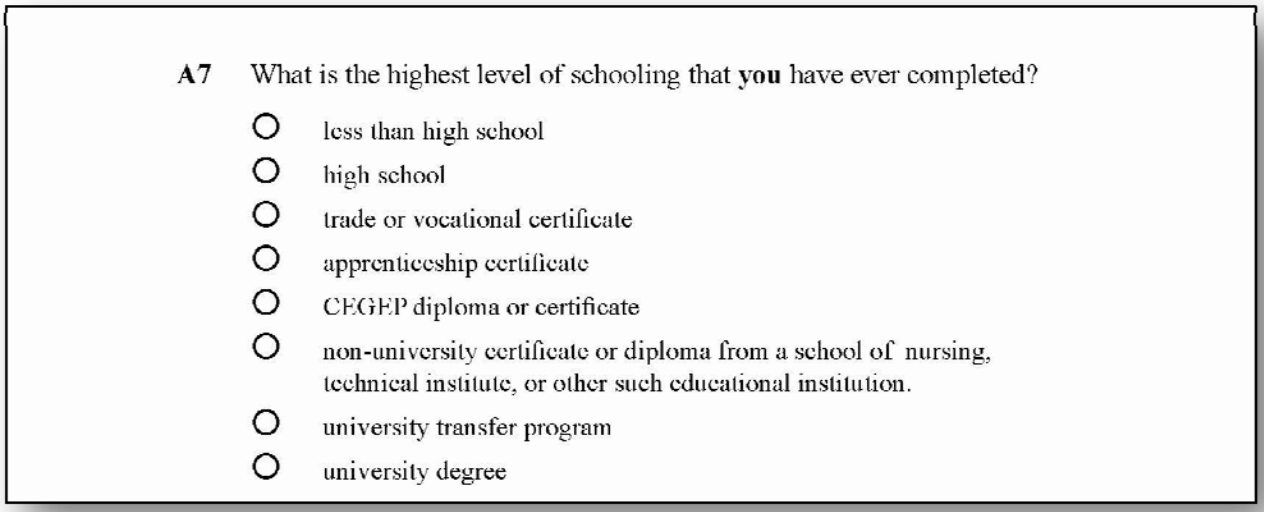


Of the 90 participants who responded, 41 percent indicated 11 years or less, 39 percent selected between 12 and 13 years and 20 percent with 14 years or more. Five participants did not indicate Years of Formal Education Completed.

Participation by Years of Formal Education Completed			
Total Participants	**≤ 11 years**	**12 – 13 years**	**≥ 14 years**
90	37	35	18

Participation by Highest Level of Schooling Completed

Participants were asked self-identify the following:



A7 What is the highest level of schooling that **you** have ever completed?

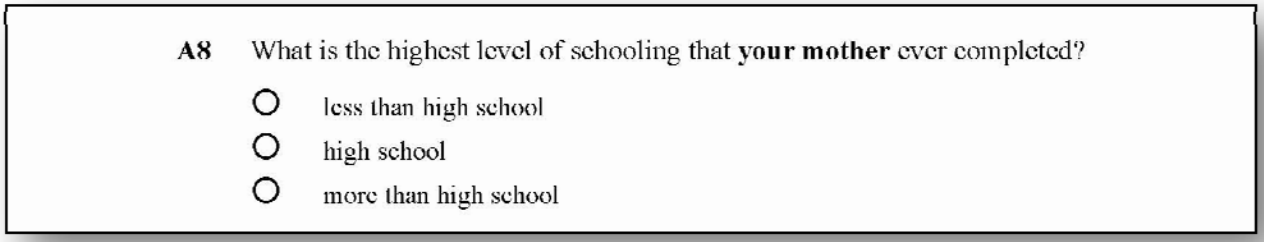
- ○ less than high school
- ○ high school
- ○ trade or vocational certificate
- ○ apprenticeship certificate
- ○ CEGEP diploma or certificate
- ○ non-university certificate or diploma from a school of nursing, technical institute, or other such educational institution.
- ○ university transfer program
- ○ university degree

Of the 91 participants who responded, 37 percent selected less than high school, 35 percent achieved a high school diploma while 27 percent completed a certificate program (includes trade, vocational, CEGEP, non-university certificates). One student completed a University degree. The number of participants decreases as completed schooling increases. Four participants did not indicate the Highest Level of Schooling Completed.

Participation by Highest Level of Schooling Completed						
Total Participants	**Less than High School**	**High School Diploma**	**CÉGEP Diploma or Certificate Apprenticeship Certificate**	**Non-University Certificate**	**Trade or Vocational Certificate**	**University Degree**
91	34	32	8	14	2	1

Participation by Mother's Highest Level of Completed Schooling

Participants were asked to self-identify the following:



Of the 91 participants who responded, 13 percent indicated less than high school, 34 percent selected high school diploma and 53 percent indicated more than high school. Four participants did not indicate Mother's Highest Level of Schooling Completed.

Participation by Mother's Highest Level of Schooling Completed			
Total Participants	**Less than High School**	**High School Diploma**	**More than High School**
91	12	31	48

Participating College Demographics

Participation by Ontario College

The following table provides the breakdown of the 95 participants by Ontario College project partners. This information was not collected through TOWES questionnaires, but by TOWES Tests assigned to each college. This was confirmed by information collected by the College Sector Committee.

Participation by Ontario College										
TOWES	**Cambrian College**	**Canadore College**	**Centennial College**	**Conestoga College**	**Durham College**	**Fanshawe College**	**Georgian College**	**Lambton College**	**Loyalist College**	**Sheridan College**
Paper	2	6	12	22	2	4	3	5	8	11
Online	0	0	0	6	9	0	3	0	0	2
Total	2	6	12	28	11	4	6	5	8	13

TOWES Scores

The following section contains TOWES Test Results in relation to participant demographics collected by the TOWES questionnaire.

Mean TOWES Scores by Domain

The following table demonstrates mean TOWES scores for all participants. Reading text had a mean TOWES score of 2.8, Document Use had a mean TOWES score of 2.2 and Numeracy had a mean TWOES score of 3.0. Overall, ACE participants had a mean TOWES score of 2.7.

Mean TOWES Scores by Domain				
N	**Mean**	**Reading Text**	**Document Use**	**Numeracy**
95	2.7 *	2.8 *	2.2 *	3.0 *

Comparison of TOWES Scores for ACE Participants with IALS Scores, 2003 (Provincial and National Populations)

Human Resources and Skills Development Canada, and Statistics Canada published the findings for the Canadian Results of the International Adult Literacy Survey[3]. The table below indicates the percentage of the Canadian and Ontario population represented at each Essential Skill level in comparison to ACE participants from this project.

	Population Distribution by Essential Skill Mean Levels								
	Reading Text			Document Use			Numeracy		
Levels	ACE	IALS Ontario	IALS Canada	ACE	IALS Ontario	IALS Canada	ACE	IALS Ontario	IALS Canada
Level 1	17 %	21.3 %	19.9 %	31 %	22.7 %	21.5 %	9 %	27.0 %	25.5 %
Level 2	38 %	26.7 %	27.8 %	52 %	25.8 %	27.1 %	32 %	28.8 %	29.6 %
Level 3	39 %	35.0 %	35.4 %	15 %	33.5 %	33.5 %	47 %	29.3 %	30.1 %
Level 4/5	6 %	17.0 %	17.0 %	2%	18.1 %	17.9 %	12 %	14.8 %	14.7 %

Source: IALS Ontario & Canada data taken from Table 1.2, Annex A / Data value for the figures; International Adult Literacy Survey, 2003; as referenced in Building on our Competencies: Canadian Results of the International Adult Literacy and Skills Survey, 2003.

[3] Statistics Canada. (2003). Building on our Competencies: Canadian Results of the International Adult Literacy and Skills Survey (Catalogue no. 89-617-XIE). Ottawa, Ontario: Canada.

TOWES Scores by Age

The following table compares mean TOWES scores with Age. There was no difference in mean TOWES scores for Age 25-34, Age 35-44 and Age 45 + (all had a mean score of 2.8). The mean TOWES score was slightly lower for Age 16-24 (mean score 2.5).

Mean TOWES Scores by Age					
Age	**N**	**Mean**	**Reading Text**	**Document Use**	**Numeracy**
16-24	51	2.5 *	2.6 *	2.1 *	2.9 *
25-34	14	2.8 *	3.1 *	2.3 *	3.2 *
35-44	15	2.8 *	2.9 *	2.5 *	3.0 *
45 +	11	2.8 *	2.9 *	2.3 *	3.3 *

TOWES Scores by Gender

The following table compares mean TOWES scores with Gender. There was minimal difference in mean TOWES scores for Female (mean score 2.6) and Male (mean score 2.7).

Mean TOWES Scores by Gender					
Gender	**N**	**Mean**	**Reading Text**	**Document Use**	**Numeracy**
Female	42	2.6 *	2.8 *	2.1 *	3.0 *
Male	48	2.7 *	2.7 *	2.3 *	3.0 *

TOWES Scores by Canadian Born

The following table compares mean TOWES scores by Canadian Born. Mean TOWES scores for Born in Canada were higher (mean score 2.7) than those Born Outside of Canada (mean score of 2.4).

Mean TOWES Scores by Canadian Born					
Birth Origin	**N**	**Mean**	**Reading Text**	**Document Use**	**Numeracy**
Born in Canada	72	2.7 *	2.8 *	2.3 *	3.1 *
Born Outside of Canada	20	2.4 *	2.5 *	1.98 *	2.8 *

TOWES Scores by Number of Years Living in Canada

Of the 20 participants who self-identified as Born Outside of Canada, there was minimal difference in mean TOWES scores based upon the Number of Years Living in Canada.

Mean TOWES Scores by Number of Years Living in Canada					
Years in Canada	**N**	**Mean**	**Reading Text**	**Document Use**	**Numeracy**
≤ 5 Years	5	2.3 *	2.4 *	1.96 *	2.7 *
6-10 Years	5	2.4 *	2.5 *	1.98 *	2.8 *
≥ 11 years	10	2.4 *	2.6 *	1.96 *	2.9 *

TOWES Scores by First Language

The following table compares mean TOWES scores with First Language. There was minimal difference in mean TOWES scores for First Language English (mean score 2.7), First Language English and Other (mean score 2.7) and First Language Other (mean score 2.6).

Mean TOWES Scores by First Language					
First Language	**N**	**Mean**	**Reading Text**	**Document Use**	**Numeracy**
English	59	2.7 *	2.8 *	2.3 *	3.0 *
English + Other	5	2.7 *	3.1 *	2.0 *	3.0 *
Other	17	2.6 *	2.7 *	2.1 *	3.0 *

TOWES Scores by Aboriginal, Métis or Inuit Person

The following table compares mean TOWES scores by Aboriginal, Métis or Inuit Person. There was no difference in mean TOWES scores (mean score 2.7).

Mean TOWES Scores by Aboriginal, Métis or Inuit Person					
Aboriginal Status	**N**	**Mean**	**Reading Text**	**Document Use**	**Numeracy**
Yes	8	2.7 *	2.9 *	2.2 *	3.2 *
No	84	2.7 *	2.8 *	2.2 *	3.0 *

TOWES Scores by Years of Formal Education Completed

The following table compares mean TOWES scores with Years of Formal Education Completed. There was minimal difference in mean TOWES scores for Years of Formal Education Completed 11 years or less (mean score 2.7), 12-13 years (mean score 2.7) and 14 years or more (mean score 2.6).

Mean TOWES Scores by Years of Formal Education Completed					
Years of Education	**N**	**Mean**	**Reading Text**	**Document Use**	**Numeracy**
≤ 11 years	37	2.7 *	2.8 *	2.2 *	3.0 *
12 – 13 years	35	2.7 *	2.8 *	2.2 *	3.1 *
≥ 14 years	18	2.6 *	2.6 *	2.2 *	2.9 *

TOWES Scores by Highest Level of Schooling Completed

The following table compares mean TOWES scores with Highest Level of Schooling Completed. There were differences in mean TOWES scores for Level of Schooling Completed. For Highest Level of Schooling Completed for Less than High School and High School Diploma the mean score was 2.6, for Highest Level of Schooling Completed for CÉGEP Diploma or Certificate, Apprenticeship Certificate and Non University Certificate, the mean score was 2.7. For Highest Level of Schooling Completed Trade of Vocational Certificate the mean score was 3.0. For Highest Level of Schooling Completed University Degree the mean score was 3.6.

Mean TOWES Scores by Highest Level of Schooling Completed					
Level of Schooling Completed	**N**	**Mean**	**Reading Text**	**Document Use**	**Numeracy**
Less than High School	34	2.6 *	2.8 *	2.1 *	3.0 *
High School Diploma	32	2.6 *	2.7 *	2.2 *	3.0 *
CÉGEP Diploma or Certificate Apprenticeship Certificate	8	2.7 *	2.9 *	2.2 *	2.3 *
Non-University Certificate	14	2.7 *	2.8 *	2.3 *	3.0 *
Trade or Vocational Certificate	2	3.0 *	3.2 *	3.0 *	3.0 *
University Degree	1	3.6 *	3.3 *	2.8 *	3.2 *

TOWES Scores by Mother's Highest Level of Schooling Completed

The following table compares mean TOWES scores with Mother's Highest Level of Schooling Completed. There is a slight inverse relationship between Mother's Level of Schooling Completed and mean TOWES score. For Mother's Highest Level of Schooling Completed Less than High School the mean score was 2.8, for Mother's Highest Level of Schooling Completed High School Diploma the mean score was 2.7 and for Mother's Highest Level of Schooling Completed More than High School the mean score was 2.6.

Mean TOWES Scores by Mother's Highest Level of Schooling Completed					
Level of Schooling Completed	**N**	**Mean**	**Reading Text**	**Document Use**	**Numeracy**
Less than High School	12	2.8 *	2.8 *	2.2 *	3.3 *
High School Diploma	31	2.7 *	2.8 *	2.3 *	3.0 *
More than High School Diploma	48	2.6 *	2.7 *	2.1 *	3.0 *

Essential Skill Proficiency Scores by Test Version (Online/Paper)

The following table represents mean TOWES scores for TOWES test version.

Essential Skill Proficiency Scores by Testing Version					
Testing Version	**N**	**Mean**	**Reading Text**	**Document Use**	**Numeracy**
Paper Based	75	2.7 *	2.8 *	2.3 *	3.1 *
Online	20	2.5 *	2.6 *	2.1 *	2.9 *

Appendix 1 – Summary Statistics

The following tables provide a statistical summary of all ACE Participant TOWES Scores.

Reading Text	
Mean	267.6211
Median	266
Mode	315
Standard Deviation	41.41826
Minimum	170
Maximum	342
Count	95

Document Use	
Mean	239.8842
Median	245
Mode	254
Standard Deviation	39.82351
Minimum	138
Maximum	326
Count	95

Numeracy	
Mean	278.7053
Median	288
Mode	254
Standard Deviation	41.00749
Minimum	138
Maximum	356
Count	95

All	
Mean	262.0702
Median	263
Mode	315
Standard Dev	43.78157
Minimum	138
Maximum	356
Count	285

Appendix 2 – Level Definitions

Levels	Reading	Document Use	Numeracy
Level 1 (0-225)	Most of the tasks in this level require the respondent to read relatively short text to locate a single piece of information which is identical to or synonymous with the information given in the question or directive. If plausible but incorrect information is present in the text, it tends not to be located near the correct information.	Tasks in this level tend to require the respondent either to locate a piece of information based on a literal match or to enter information from personal knowledge onto a document. Little, if any, distracting information is present.	Tasks in this level require the respondent to show an understanding of basic numerical ideas by completing simple tasks in concrete, familiar contexts where the mathematical content is explicit with little text. Tasks consist of simple, one-step operations such as counting, sorting dates, performing simple arithmetic operations or understanding common and simple percents such as 50%.
Level 2 (226-275)	Some tasks in this level require respondents to locate a single piece of information in the text; however, several distracters or plausible but incorrect pieces of information may be present, or low-level inferences may be required. Other tasks require the respondent to integrate two or more pieces of information or to compare and contrast easily identifiable information based on a criterion provided in the question or directive.	Tasks in this level are more varied than those in Level 1. Some require the respondents to match a single piece of information; however, several distracters may be present, or the match may require low-level inferences. Tasks in this level may also ask the respondent to cycle through information in a document or to integrate information from various parts of a document.	Tasks in this level are fairly simple and relate to identifying and understanding basic mathematical concepts embedded in a range of familiar contexts where the mathematical content is quite explicit and visual with few distracters. Tasks tend to include one-step or two-step processes and estimations involving whole numbers, benchmark percents and fractions, interpreting simple graphical or spatial representations, and performing simple measurements.
Level 3 (276-325)	Tasks in this level tend to require respondents to make literal or synonymous matches between the text and information given in the task, or to make matches that require low-level inferences. Other tasks ask respondents to integrate information from dense or lengthy text that contains no organizational aids such as headings. Respondents may also be asked to generate a response based on information that can be easily identified in the text. Distracting information is present, but is not located near the correct information.	Some tasks in this level require the respondent to integrate multiple pieces of information from one or more documents. Others ask respondents to cycle through rather complex tables or graphs which contain information that is irrelevant or inappropriate to the task.	Tasks in this level require the respondent to demonstrate understanding of mathematical information represented in a range of different forms, such as in numbers, symbols, maps, graphs, texts, and drawings. Skills required involve number and spatial sense, knowledge of mathematical patterns and relationships and the ability to interpret proportions, data and statistics embedded in relatively simple texts where there may be distracters. Tasks commonly involve undertaking a number of processes to solve problems.
Level 4 (326-375)	These tasks require respondents to perform multiple-feature matches and to integrate or synthesize information from complex or lengthy passages. More complex inferences are needed to perform successfully. Conditional information is frequently present in tasks at this level and must be taken into consideration by the respondent.	Tasks in this level, like those at the previous levels, ask respondents to perform multiple-feature matches, cycle through documents, and integrate information; however, they require a greater degree of inference. Many of these tasks require respondents to provide numerous responses but do not designate how many responses are needed. Conditional information is also present in the document tasks at this level and must be taken into account by the respondent.	Tasks at this level require respondents to understand a broad range of mathematical information of a more abstract nature represented in diverse ways, including in texts of increasing complexity or in unfamiliar contexts. These tasks involve undertaking multiple steps to find solutions to problems and require more complex reasoning and interpretation skills, including comprehending and working with proportions and formulas or offering explanations for answers.
Level 5 (376-500)	Some tasks in this level require the respondent to search for information in dense text which contains a number of plausible distracters. Others ask respondents to make high-level inferences or use specialized background knowledge. Some tasks ask respondents to contrast complex information.	Tasks in this level require the respondent to search through complex displays that contain multiple distracters, to make high-level text-based inferences, and to use specialized knowledge.	Tasks in this level require respondents to understand complex representations and abstract and formal mathematical and statistical ideas, possibly embedded in complex texts. Respondents may have to integrate multiple types of mathematical information, draw inferences, or generate mathematical justification for answers.