



Examen des architectes du Canada
Examination for Architects in Canada

Statistical and technical report for the ExAC 2010

Summary

Introduction

In order to fulfil its mandate, the Committee for the ExAC (CExAC) offers the Examination for Architects in Canada (ExAC) annually in both of the official languages.

In order to fulfil its mandate, the Committee for the ExAC (CExAC) offers the Examination for Architects in Canada (ExAC) annually. The ExAC consists of four exams (sections) that cover a dozen themes and one hundred thirty (130) specific objectives. The four sections, each of which lasts a maximum of 3 hours, are offered simultaneously throughout Canada, over a period of two days. The ExAC is available in both of the official languages of Canada.

The ExAC is an examination for admission that is recognized by most of the professional bodies that oversee the architectural profession in the Canadian provinces and territories.

The ExAC is intended for interns who wish to obtain access to the profession of architect. The ExAC is an examination for admission that is recognized by most of the professional bodies that oversee the architectural profession in the Canadian provinces and territories. Successful completion of the ExAC is one of the requirements that ensure the competence of architects. The ExAC is the final step that must be taken by interns who wish to join the profession.

The purpose of this summary is to describe some of the technical characteristics and the professional expertise that contributed to ensuring the exactness, the validity and the psychometric integrity of the ExAC 2010.

Methods used in the development of the ExAC

Item Development

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The ExAC is based on a series of general and specific objectives that were developed, reviewed and approved by a group of architects from the three founding professional bodies (Ordre des architectes du Québec, Ontario Association of Architects and Alberta Association of Architects). These objectives define the areas and levels of knowledge required by the profession. They are used to develop the multiple-choice items and the short-answer items for each exam so that the exams will have the same characteristics every year.

Every year, new items are developed.

Every year, new items are developed and field-tested so that they can become items on future exams. Architects from several of the professional bodies assist the CExAC in all aspects of the development of the items. The CExAC recruits and trains architects so that they can participate in the committees that develop the items. The various regional committees that develop the items for each exam consist of between 5 and 14 experienced architects. The committee

members meet a few times during the year to develop and review the items. All of the items must conform to the expectations and learning content described in the table of specifications. The architects are provided with copies of the *Guide for the Development of Items for the ExAC* to assist them in developing the multiple-choice and short-answer items and the descriptive rating scales for the items.

The members of the ExAC Content Evaluation Committee verify each item.

The members of the CExAC validate each item with respect to content and level of difficulty. For the multiple-choice items, they take into consideration the clarity and completeness of the content of an item, the exactness of the correct answer, the plausibility of the distractors, and the rules that apply to item development. For the short-answer items, they take into account the correlation between an item and its descriptive rating scale, and they determine if the items generate the expected range of answers, irrespective of the place of origin of the intern.

Each year the items to be field-tested are incorporated into actual exams. These items facilitate, among other things, the comparison of data and test equating in order to maintain relative difficulty level from one year to the next.

Field-testing

The CExAC subjects the new items to a field-testing process. If the results of the field-testing indicate that the items are acceptable, they will be used in current and future exams. Items to be field-tested are incorporated into the exams that are given each year in order to ensure a representative sampling of new items. The scores obtained from the items that are being field-tested are not necessarily used to determine the results for the interns.

Subjecting the exam material to field-testing ensures that the items that are selected for future exams are of good quality and that they are fair, from a psychometric point of view, for all of the interns. The field-testing process also provides data that enables the exams from each year to be matched to those of previous years, so that the results can be compared in a valid manner over time. The quality of the comparison of the data from one year to another relies on this equating process.

Some guidelines must be followed when items are developed.

Exam Development

The exam items are selected from newly-developed items and from items that were previously field-tested. Several important factors must be taken into account when selecting items to be used in an exam that is offered across the country:

- The measurement parameters for each item must demonstrate that the exam item is fair and of comparable difficulty to those used in previous exams.
- The items that are selected for an exam are reviewed to ensure that they conform to the exam specifications, that their content is balanced, and that there is no differential functioning in the items or in the exam.
- It is important to note that the items correspond to content groups but that not all of the content in a group is measured in any one exam; nonetheless, all of the measurable content will eventually be included in an exam.
- The preparation of the items is done in accordance with a table of specifications that remains constant from one year to the next.

The administration manual describes the procedures that ensure that the ExAC is administered in a fair and uniform manner for all interns.

Exam Administration

The administration manual for the ExAC provides a detailed description of the administration procedures. These procedures must be followed by the ExAC administrators and supervisors to ensure uniformity and fairness in the administration of the exams for interns all across Canada. Each administration site and each professional body receives copies of the administration manual, in both French and English, so that the administrators and supervisors can be trained to administer the exams. The manual describes in detail what the administrators and supervisors who administer the exams must do, and it deals specifically with:

- the procedures to be followed (e.g. the preparation of material that is to be distributed to the interns, instructions to be followed during the examination phase);
- the specific adaptations and provisions that are permitted for interns who have submitted a request for adaptations;
- what needs to be said to the interns (e.g. instructions for presenting the four exams);
- the professional responsibilities of the personnel involved in the examination phase.

Rigorous scoring procedures ensure the reliability of the ExAC results.

Scoring

The answers to the multiple-choice items are read and scored by an optical mark reader. The data that is collected is sent automatically to a database. Insofar as the short-answer items are concerned, the CExAC follows rigorous scoring procedures to insure the validity and reliability of the exam scores. Trained markers score all of the answers to the short-answer items. All answers are scored at least by two different markers, sometimes three.

The selection of the exemplars

The selection of the exemplars (an exemplar is a typical copy of a particular score point) permits the determination of the range of acceptable levels of performance for each score point in each descriptive scale so that a consensus can be reached on the scoring of the answers given by the interns. This range is used to train the markers.

For the selection of the exemplars for the short-answer items, the answers provided to the item by interns during the field-testing phase are used, and the selection is made just before the exams are scored.

In regards to scoring, rigorous training and quality control procedures provide results with the highest level of validity.

The CExAC has developed procedures and a scoring process to ensure uniformity. The training is intended to develop a clear and uniform understanding of the scoring material so that each consultant and each marker will interpret and use the scoring material in the same manner. The result is a level of scoring of the responses of the interns that is reliable, uniform, valid and precise, no matter which marker has scored the items. The markers are all trained to perform scoring with the same scoring material.

Measurement of the reliability and the validity of the scoring by the markers

The measurement of interrater reliability (consistency between markers when scoring the same test copy) and of the validity of the scoring permits the degree of uniformity of the scoring by the markers to be assessed. The scores assigned to the answers from a given intern are compared to determine if they are exactly the same or if they differ by one score point (near-perfect) or by more than one score point. At least two markers score each answer. If the two scores are not identical, the answer will be assigned to a third marker for scoring.

Interrater reliability is determined by a comparison of the scores awarded by a pair of markers to the answers provided by the interns.

Interrater reliability for the 2009 ExAC

The percentages of perfect agreement (when two independent markers give the exact same score on a particular answer from a given intern) for Section 1 vary between 51 % and 90 % for the English-language version and between 52 % and 89 % for the French-language version. The percentages of perfect agreement for the items in Section 1 of the English-language and French-language versions exceed the CExAC objective.

The percentages of perfect agreement for Section 3 vary between 57 % and 92 % for the English-language version and between 62 % and 97 % for the French-language version. The percentages of perfect agreement for the items in Section 3 of the English-language and French-language versions exceed the CExAC objective.

When the scores from two markers are not in 100 % agreement, a third marker proceeds with a third scoring. The markers are not aware of a previous score given by another marker. A marker does not know whether he or she is the first, the second, the third or the fourth to score a particular intern's response.

Analysis of the exam results for the ExAC 2010

Several expert judges (architects trained as correctors during the scoring session) review each exam item and estimate the likelihood of success of a minimally competent intern.

The process for setting cut scores consists of a series of steps that permit the determination of the passing score for each exam. The process is begun by asking several expert judges (architects who have been trained as markers during a scoring session) to examine each exam item and to estimate the likelihood of success of a minimally competent intern. The average of the estimates of the judges for all of the exams constitutes one of the elements taken into consideration when establishing the minimum score required to pass a section of the exam. Also, for the purpose of test equating, some items are reused and tracked from year to another.

An intern who passes a section of the ExAC will have received a score that is higher than the cut score determined by the judges, and this same result is also higher than the lowest confidence interval that could be considered as a margin of error.

Since the exams are measuring instruments with an imperfect level of reliability, a confidence interval, situated around the cut score estimated by the judges is calculated. This enables the benefit of the doubt to be given to the interns with an apparent minimum level of competence. An intern who fails an exam will have received a score that is lower than the cut score determined by the judges, and this same result is also lower than the lowest level of the confidence interval that could be considered as a margin for error.

Of a total of 545 interns, 402 passed all of the sections for which they were eligible, therefore 73.8 % of the interns succeeded in all sections. The overall success rate for all of the exams is 85.5 %.

Twelve judges (markers) participated in the scoring process of the ExAC 2010. Many of these judges are bilingual. The table below shows the success rate for each section. Of the 545 interns who took the ExAC 2010, 402 of them passed all of the sections for which they were eligible, therefore 73.8 % of the interns succeeded in all sections. The overall success rate for all of the exams is 85.5 %.

Success rate for the English and the French forms

Section 1	Section 2	Section 3	Section 4
405/476	401/462	395/466	390/457
85.1 %	86.8 %	84.8 %	85.3 %

The registrar for each professional body transmits the results to the interns in a performance report.

The report provides constructive information on the portions of the exam that were less-successfully completed.

An intern may request a review.

Publication of the results

The registrar for each professional body transmits the results to the interns in a performance report. This document reports the status of the intern, the sections of the ExAC that were passed, the equivalencies that were awarded (where applicable), and the sections that need to be taken again. The report does not include raw scores. The results are indicated in pass/fail format.

Where a section must be taken again, the report provides constructive information on the sections of the exam that were less successfully completed. The intern can then take the section again the next time that the ExAC is offered. The sections that were passed do not have to be rewritten. It is important, however, to communicate with the respective professional body in order to obtain information about exceptions that are linked to time limits.

Requests for review

An intern may request a review. The precise rules that apply to this process are contained in the guide. Once a request has been made, the consultants perform a multi-point review of the bubble sheets. The short-answer items are scored again by experienced markers. Data regarding the intern is tracked through the databases in order to verify the integrity of the data. At the time of publication of this report, the number of interns who will exercise that option for the ExAC 2010 is not known. We note that twelve interns requested a review after receiving their results from the ExAC 2009.