

ICT Diploma in Advanced Concrete Technology

Individual assignments – an alternative to the individual project

Tony Binns, Peter Domone and John Newman

Background

As all ICT members will know, the Diploma in Advanced Concrete Technology not only leads to corporate membership of the Institute, but also is the highest award in concrete technology, at the same level as a masters degree.

Until very recently, the award of the diploma required success in the examinations set by the ICT examinations committee together with a report on an individual project on a subject chosen by the candidate and carried out to a sufficiently advanced level. In the days of the residential ACT course, which first ran at the Cement & Concrete Association's training centre, Fulmer Grange, and then moved to Imperial College and thence to the University of Nottingham, the project was carried out in the period between the two residential sessions, with the report normally submitted soon after the time of examinations.

Two problems which resulted from the increasing demands of employers occurred simultaneously:

- attendance at the two residential sessions of three weeks each was becoming harder to justify;
- finding sufficient time and facilities to carry out the project was increasingly difficult.

In response to the first of these, the tutors in TALENT (Teaching and Learning Enterprises Ltd.) took on the task of transforming the residential ACT course into a distance-learning course; this had the added advantage of making it available to all eligible candidates worldwide. Each course runs for nearly two years and so far three courses have been completed, starting in 2004, 2006 and 2009.

Addressing the second problem was not so straightforward, and increasing numbers of candidates who successfully passed the examinations did not or could not complete their projects and therefore failed to obtain the diploma. However, following extensive discussions, principally within the ICT Examinations Committee, it was decided to modify the 2009 course such that candidates either within the current cohort or who had previously passed the examinations had the option of carrying out a series of individual assignments which were deemed to be equivalent to the individual project.

The web-based ACT course

Instead of the traditional lecture-based residential course, the web-based distance-learning system provides participants with project-based learning opportunities which require fact gathering and problem solving. This encourages the development of the thinking skills required for an understanding of advanced concrete technology. Access is provided to information additional to that in the four

volumes of the ACT book which was published in time for the first course¹. The course is organised by TALENT, and is accredited by The Concrete Society / Institute of Concrete Technology. The tutors are Dr John Newman, Dr Peter Domone and Mr Tony Binns.

The course is organised around a set of assignments based on the ICT syllabus and learning objectives. These are set by the course tutors, and enable participants to share information and to interact online with acknowledged specialist/experts in the topics covered. The teaching and learning is therefore based on problem-solving.

Group assignments

For each assignment, one participant within each group of typically five or six is appointed by the tutors as the group leader. After every two assignments the groups change. Each assignment is based on a single broad subject that covers a range of the learning objectives; the group then collaborates to produce an advanced-level report within a fixed period of time, normally four weeks. By the end of the course when approximately fourteen group assignments have been completed, the entire ACT syllabus has been covered.

The assignment reports are assessed by the tutors and returned to the candidates with constructive feedback which, in combination with revision material, prepares them for the examinations that take place in July-August, almost two years after they embarked on the course. Through the assignments, candidates not only absorb knowledge but also develop the transferable skill of technical report-writing, including the need for acknowledgement of sources by appropriate citation and referencing.

Outcomes

The problem-based distance-learning method is demanding in terms of both the time commitments required by the candidates over an extended period and the level of knowledge and understanding that must be achieved. Its efficacy for the ACT course is demonstrated by the pass rate in the written examinations. Also, the candidates frequently comment that they learn a great deal throughout the course which is of significant benefit in their working lives.

Individual assignments

As outlined above, in the 2009 course four individual assignments were offered, taking the place of four of the group assignments for those wishing to follow this route rather than carry out an individual project. The subject areas chosen were

- Special concretes and processes

¹ Newman J B and Choo B S (eds) Advanced Concrete Technology 1: Constituent Materials, 2: Concrete Properties, 3: Processes, 4. Testing and Quality, Elsevier, Oxford, 2003

- Testing & repairs
- Concrete production and use
- Finishes & formwork.

These were sufficiently broad for a number of questions to be set in each. Each participant was then allocated one of these questions, and expected to produce an individual report in similar timescales to group assignments i.e. four weeks. The four assignments were spaced at approximately equal intervals during the course.

The questions do not lead to a closed solution, and require the candidates to gather information and formulate an answer in the form of the report with a maximum specified length, normally 4500 words.

Two examples are:

Special concretes and processes:

- (a) Compare and contrast the properties of concrete incorporating (i) micro-synthetic fibres (ii) macro-synthetic fibres and (iii) steel fibres.
- (b) Discuss all the issues associated with an application for each of the above.

Concrete production and use:

A concrete of strength class C50/60 has been specified for the central structural core of a 300m high building, to be constructed in the UK.

- 1) As a concrete technologist working for a contractor who is bidding for the work, give advice to your company on the issues that need to be considered relating to the supply and placing of the concrete. Jump-form construction will be preferred, with speed of construction important, and the contract is sufficiently large for site batching to be considered.
- 2) Produce a method statement for transporting, compacting and finishing the concrete.
- 3) Specify a quality control and inspection programme for the concrete.

Assessment

As with the group assignments, one aim of each of the individual assignments is to cover some of the learning objectives of the course. However as the four together must also act as the equivalent of the individual project, they are rigorously assessed with respect to:

- evidence of wide and up-to-date literature search and reading;
- clear formulation of relevant responses;
- clear understanding of the relevant concrete technology at the level appropriate to the ACT Diploma;
- insight and critical ability in the use of the evidence;
- clearly expressed ideas;
- appropriately formatted report, with a high standard of presentation;

- correct use of citation and referencing conventions to ensure that the examiners can distinguish between analysis, comments, opinions, etc. of the writer and the information that has been taken from external sources.

Each individual assignment is independently double-marked by two of the course-tutors acting on behalf of the ICT Examinations Committee. Passing grades are A, B and C, and failing grades D and E. Any borderline cases go to an independent moderator for third marking. Assignments with a D or E (failing) grade can be resubmitted within two months of the assessment being posted. If satisfactory, a grade C will then be awarded. Each candidate is informed of the grade for each assignment soon after marks have been agreed.

Diploma requirements

To qualify for the Diploma, candidates must complete all four assignments within the required timescales and passed three of these. Participants who have previously passed the examinations are required to carry out the individual assignments at the same time as the full participants in the course.

To qualify for a Distinction in the Diploma, candidates must complete all four assignments within the required timescales, and passed all of these with an average of grade B or above.

Final remarks

The individual assignment option has been introduced to ensure that those diploma candidates who, for whatever reason, are unable to complete an individual project but are successful in the examinations have the chance to fully demonstrate that they are worthy of corporate membership of the Institute. This will not only benefit them in their career paths, but will help to ensure a regular stream of new corporate members.

Any past participants who have passed the examinations but have not completed an individual project and who wish to pursue this route should contact the ICT Executive Officer.