ACADEMIC
APTITUDE
PROFILE

PROPOSED
SCHEME

UNIVERSITY OF CAMBRIDGE LOCAL EXAMINATIONS SYNDICATE

May 1992
Contents

1 The Academic Aptitude Profile in Outline

2 The Skills
   2.1 Communication
   2.2 Numeracy
   2.3 Critico-Creative Thinking
   2.4 Critico-Inferential Thinking
   2.5 Formal Reasoning

3 Administration of the Academic Aptitude Profile
   3.1 Delivery
   3.2 Central Records
   3.3 Provision of a Testing Service

4 Using the Academic Aptitude Profile
   4.1 Placement
   4.2 Guidance and Skills Teaching
   4.3 Recruitment

5 Interpreting the Results of Assessment
   5.1 Standards
   5.2 Avoiding Bias
   5.3 Sensitive Interpretation
1 THE ACADEMIC APTITUDE PROFILE IN OUTLINE

The Academic Aptitude Profile is intended for use by institutions of higher education and by organizations concerned with professional training or vocational education. It aims to promote the development of individuals and to assist institutions and organizations in the planning of education and training.

The Profile offers the means to assess the following skills:

* Core Skills:

1 Communication

2 Numeracy

* Higher Order Thinking Skills which are held to underlie academic study and professional practice:

3 Critico-Creative Thinking

4 Critico-Inferential Thinking

5 Formal Reasoning

The Core Skills might be regarded as representative of minimum competence for Access course admission. The Higher Order Thinking Skills are viewed as developing out of the Core Skills during courses of higher study. Some ability in the Higher Order Thinking Skills might be expected on entry to a degree-level or professional course, and such a course would also be expected to develop such skills.

When fully developed, the Profile is intended to serve four main purposes within the broad aims of assisting individual growth and institutional planning. These are:
* placement of individual applicants in appropriate courses or programmes

* appraisal and guidance of students and trainees during their courses

* provision of materials for supportive instruction aimed at the development of the academic and professional skills

* recruitment

It is intended that the Profile should be available on subscription for use within institutions and organizations. It is also intended that facilities should be available on a fee basis for individuals who are not affiliated to subscribing organizations to be assessed in assessment centres.
2 THE SKILLS

2.1 Communication

It is intended that the assessment of communication should be in line with the National Curriculum Council's outline description of this skill (see also section 1.2 of the accompanying document "Academic Aptitude Profile: Rationale"): 

Communication skills include the ability to:

(i) identify information sources and receive information appropriate to a range of purposes; and

(ii) present information and use language in a range of forms appropriate to purpose and audience.

It is not intended that candidates should be asked to produce novel arguments of an inductive or creative kind (the skill demanded by Critico-Creative Thinking), but rather that they should receive information and summarize and select from it in order to re-present the material for a particular purpose and audience. Sources would typically be newspaper articles and information and publicity pamphlets. It is expected that specimen materials and guidelines for interpretation will be available shortly.

2.2 Numeracy

The proposal for the assessment of Numeracy is, in the first instance, a short oral or paper-and-pencil assessment of the basic numerical skills, which have been suggested by the Mathematical Reasoning Steering Group, and which might be regarded as a necessary basis for Access course study. (See "Mathematical Schemata" in "Guide to Writing and Editing Mathematical Reasoning Items".) The questions will each involve single concepts and operations so that most candidates can demonstrate success rather than failure. It is expected that specimen materials and guidelines for interpretations will be available shortly. The value of this kind of assessment would also lie in its indication as to whether a particular individual possessed sufficient knowledge to attempt the Formal Reasoning component.
2.3 Critico-Creative Thinking

Critico-Creative Thinking is

(i) characterized by imaginative thought, typically the production of inductive or creative arguments, for example in putting forward hypotheses or explanations;

(ii) differentiated from Critico-Inferential Thinking by its greater emphasis on productive thought and by its lesser emphasis on the analysis of arguments which are provided;

(iii) differentiated from Formal Reasoning by its use of ordinary, everyday language, rather than by language which uses and demands formal rules and concepts.

Critico-Creative Thinking emphasizes the productive side of Critical Thinking, while Critico-Inferential Thinking emphasizes the receptive or analytical side.

While the materials currently being developed as suitable stimuli are mainly textual, consideration is also being given to the use of videotape as an alternative medium. Candidates might be provided with background information beforehand and would be asked to write an essay over the course of an hour. The stimuli relate to a range of contemporary social and environmental issues and problems.

2.4 Critico-Inferential Thinking

The Critico-Inferential Thinking component aims to assess the kinds of reasoning skills which are used in the analysis and criticism of real everyday arguments. The items are expressed in natural language. The subject matter of the stimuli ranges very widely and may include anything from cigarette smoking to car maintenance, or from natural science to law. Typical sources for stimulus material include letters to the editor, newspaper and magazine articles, and non-technical articles and books.

The assessment consists of a series of multiple-choice items, each relating to a stimulus passage, usually within the range of 25 - 125 words. The item categories are as follows:
summarizing the main conclusion of an argument
drawing a conclusion when premises are given
identifying assumptions
assessing the impact of additional evidence
detecting reasoning errors
matching one argument with a second which has the same logical structure
applying principles

2.5 Formal Reasoning

Formal Reasoning

(i) is characterized by the use of well-defined or formal rules and concepts in problem-solving (this use is not important in the ability of Critical Thinking);

(ii) uses three kinds of symbol systems: language, number, and space;

(iii) is distinguished from Numeracy by the emphasis on "insightful" or "search-driven" thinking, rather than "reproductive" or "schema-driven" thinking.

The problems presented in a series of multiple-choice questions vary in difficulty in order that a wide range of individual abilities can be assessed. All items are intended to assess some aspect of "insight", specifically categorized as selective encoding, selective comparison, and selective combination, following Sternberg's (1985) model. Further information is provided in the supporting specimen materials.

Items are also categorized according to their content, as follows:

Spatial
Linguistic/Data Handling
  probability
data tables
  graphs
Numerical
  computation
  enumeration/searching
Linguistic/Critical
3 ADMINISTRATION OF THE ACADEMIC APTITUDE PROFILE

3.1 Delivery

The intention is that participating organizations and institutions which accept the guidelines for good practice should have access to a bank of assessment materials which would enable them to assess students/employees at any suitable time. Strict security arrangements would be applied, and materials would be renewed periodically.

Institutions and organizations would be encouraged to use a computer-adaptive assessment system, which the Syndicate has developed, for the assessment of certain skills. Skills which are assessed by written work would be assessed within the institution or organization, but would be subject to monitoring by Syndicate staff.

It is envisaged that the assessment materials would be available for administration to students and applicants as required. These materials would be periodically renewed and would include:

(a) copies of a current Academic Aptitude Profile handbook containing, inter alia, a statement of the aims of the Profile, an outline statement of the skills assessed, details of administrative arrangements, and guidelines for the interpretation of results;
(b) copies of booklets containing descriptions of the skills, and specimen assessment materials, for use by admissions tutors and others;
(c) booklets providing information for students and applicants;
(d) question papers;
(e) answer sheets;
(f) discs for use in computer-adaptive assessment;
(g) record forms.

Subject to adequate security arrangements, the organization of the Profile within an institution or organization would be determined by local needs and circumstances.
3.2 Central Records

In order to facilitate the use of the Profile, the Syndicate would consider maintaining records of skills scores sent to it by participating organizations, in order that it could despatch an individual's skills record to another organization, at the request of that individual.

The Syndicate would also consider maintaining copies of essays, written as part of the Critico-Creative skill assessment, for despatch in the same way as required. This would meet a widely expressed need by admissions tutors that they should be able to appraise personally the written work of non-local applicants.

3.3 Provision of a Testing Service

It is the Syndicate's intention that, where sufficient demand exists, the skill of individuals should be assessed on particular dates in key centres within the U.K. Candidates' work would be assessed by the Syndicate except for the Critico-Creative essays. Essays written as part of the Critico-Creative assessment would be held by the Syndicate, but would be made available to participating organizations/institutions at the request of the candidates, along with criteria for assessment and samples of essays which have been assessed.
4 USING THE ACADEMIC APTITUDE PROFILE

4.1 Placement

Placement is one of the greatest problems facing post-compulsory educational institutions, particularly but not only in connection with "non-standard" applicants. The Profile is intended to make placement a less hazardous procedure and one which is perceived by applicants as fair.

There are three main aspects to consider:

(a) the entry requirements of the courses which are open to an applicant
(b) the attainments and abilities of the applicant
(c) the personal qualities and experiences of the applicant

Many admissions tutors in higher education have already specified (a) in terms of traditional qualifications such as A-levels. In using the Profile, the need will be to establish the entry requirements in terms of the Skills, in some cases in conjunction with other subject-based qualifications. This would probably be best achieved through the assessment of a cohort of students already admitted. The entry requirement might then be stated in the form of a profile or profiles of levels of achievement across the skills.

The assessment of the attainments and abilities of the applicant would be partly on the basis of existing or anticipated qualifications and partly on the basis of in-college skills assessment. In-college skills assessment need not necessarily take place in the same college as that to which the applicant is applying (section 3.2, above).

Finally, there are the personal qualities and experiences of the applicant. These may be assessed through a personal interview, through a Record of Achievement, or through testimonials of various kinds. Increasingly, applicants may be expected to present a recent Record of Achievement. The assessment of personal qualities, in relation to entry requirements and an individual's achievements and abilities, is inevitably a less than rigorous process, but it is of crucial importance in many cases (section 5.3).
4.2 Guidance and Skills Teaching

The guidance of an individual in the course of an educational or training programme can be viewed in a similar way to placement. There are three aspects to consider:

(a) the aims or plans of the individual, and of the course which the student is following;
(b) the attainments and abilities of the applicant, which may include a recent skills assessment;
(c) the personal qualities and experiences of the individual.

The guidance of an applicant in relation to skills must be positive (there is no point in identifying a weakness if remedial action is not possible), and it is for this reason that guidance for the teaching of skills is a priority of the present development.

4.3 Recruitment

Recruitment may be regarded as having certain aspects in common with placement (section 4.1), but there is a major difference in the stress on the selection of the best applicant for a particular place, rather than on the placement of an applicant in the optimum course for his or her development.

With regard to recruitment to higher education, the AAP development team has become increasingly persuaded that the usual aim of aptitude assessments, that is for reliable, realistic and statistical measures of predictive validity are very difficult to obtain in the British context; they would often have to be institution- and perhaps even course-specific - so that small numbers become a problem; they take no account of many other factors which are relevant to academic success - like motivation; and they would depend clearly on the reliability of teachers' assessments of achievements.
For these reasons, and for recruitment both to higher education and professional courses, it will probably be necessary to depend upon the judgements of tutors and professionals in determining the value of the Profile. They would know the constructs which are being measured, would understand why they should be useful in predicting students' performance, and would be relatively well placed to take other factors into account in assessing the predictive usefulness of the skills assessment. Nevertheless, it could sometimes be useful to attempt to establish predictive usefulness in a statistical sense, by seeking evidence of correlations between the results of the assessment of skills and other reliable and relevant measures. This will be pursued as the Profile is further developed.
5 INTERPRETING THE RESULTS OF ASSESSMENT

5.1 Standards

For the objectively scored parts of the skills assessment, standards will be maintained from administration to administration through well-established psychometric techniques. These will ensure that no candidate is unfairly discriminated against by virtue of receiving a more difficult set of tasks than another candidate. It also means that those interpreting the results can be confident that a result on one assessment of, say, Formal Reasoning, represents the same ability as the same result on another occasion.

For the subjectively assessed elements, the intention is that, as far as possible, the same criteria should apply to all essays or other pieces of work and that, so long as these criteria are consistently applied, an essay interpreted on one occasion by one assessor should be credited with the same standard as on another occasion by a different assessor. Consistency of such assessment can, in some situations, be difficult to achieve, however, and the Syndicate will monitor the reliability with which such assessment is carried out.

5.2 Avoiding Bias

The Syndicate is anxious that there should be nothing in the production, administration or use of the Profile that leads to unfair treatment of any individual because they belong to any particular subgroup in the population. The Syndicate would establish a programme for the continuing monitoring of the performance and the further academic progress of identified sub-groups. It is at present proposed that the monitoring project consider differences of sex, race or ethnic background, age, and social class.

There are four possible kinds of bias that may affect these subgroups:

i) bias in use of the results
ii) perceived bias in the assessment process
iii) perceived bias in the assessment materials
iv) statistical bias in item difficulty.
Avoidance of the first two of these possible kinds of bias depends mainly on procedures within participating organizations. With respect to the first, guidelines will be prepared to advise users on how best to interpret the results of the assessment in conjunction with whatever other information may be available. Particular attention will be given to the many incommensurable qualities that applicants, and especially mature applicants, may bring.

With respect to the second, it is important that applicants should not be discouraged in any way by the process of applying. The choices of paper or computer, fixed session or 'on demand', will help to make the experience of applying and being assessed less stressful for applicants who have not come through traditional channels. Again, guidelines for administrators will be provided. The computer version of a skills assessment, where available, must ensure that unfamiliarity with the medium does not constitute a handicap for applicants.

Avoidance of the third and fourth kinds of bias depend mainly on appropriate development procedures and on the monitoring of assessment results. These issues are addressed in the accompanying paper on the Rationale of the Academic Aptitude Profile.

5.3 Sensitive Interpretation

The sensitive interpretation of an individual's results goes beyond the general issue of avoiding bias with respect to groups. All admission and interviewing personnel should be aware of the view of personal development expressed in section 3.3 of the accompanying paper "Academic Aptitude Profile - Rationale". Development is dependent on opportunity, intelligence, and personality, and personal qualities and experiences should always be sought and considered when assessing an applicant's potential.