

THE GENDER EQUITY IN SENIOR SECONDARY SCHOOL ASSESSMENT (ESSSA) PROJECT- THE LANGUAGE OF EXAMINATION QUESTIONS

Introduction

The Gender Equity in Senior Secondary School Assessment (ESSSA) Project has been funded by the Department of Employment, Education and Training as a Project of National Significance to explore assessment issues in the post-compulsory area, with a particular focus on gender equity in the performance outcomes of students. This is the largest project of its kind and the first awarded to an assessment authority. The Project is managed by the Senior Secondary Assessment Board of South Australia (SSABSA) on behalf of all of the Australian Curriculum, Assessment and Certification Authorities (ACACA), and is designed to fill an identified gap in national research in the assessment area.

The involvement of all Australian assessment authorities in the Project indicates their commitment both to ensuring that the assessment instruments they use are equitable, and to the monitoring of student performance in relation to these instruments. A significant amount of research work into assessment has already been undertaken at the state level by many of the assessment authorities. The work of the ESSSA Project is both drawing on and supplementing this, by producing national participation and performance statistics in selected subjects, and exploring differential outcomes by gender in relation to question type and nature.

Ten aims encapsulate the research tasks of the ESSSA Project, and these are as follows:

1. What is the pattern of participation of females and males in selected Year 12 subjects?
2. What associated factors are linked with this participation? (Such factors may include school sector and rural or metropolitan differentials.)
3. What historical trends towards the present patterns of Year 12 participation can be determined by the statistical data?
4. What patterns of gender differences in performance exist at Year 12 level in selected subjects? (This will involve investigating assessment outcomes in school-based assessment as well as public examination results.)
5. What kinds of public examination questions have different performance outcomes for females and males?
6. What identified school-based assessment procedures have different outcomes for females and males? (The data available to the ACACA authorities are limited in the school-based assessment area. Certain types of school-based activity, for which data are available, will need to be identified, and will define the scope of this research.)

7. What is the nature of the identified assessment questions and procedures for which there is a significant difference in performance for females and males? (For the purposes of this research, the nature of the questions refers to a set of classifications involving the language of instruction and the required language mode of student response.)
8. What identified types of assessment questions (multiple choice, essay and structured) are associated with differential gender outcomes in performance?
9. What explanations (such as the context and images of the subject as presented in assessment modes, as well as state policies) can elucidate the different gender outcomes in performance at Year 12 level?
10. What are the implications of this research for both policy and practice in the curriculum and assessment areas at senior secondary school level?

Structure of the Project

The aims of the ESSSA project conveniently fall into four sub-sets:

Aims 1 - 3 focus on participation rates in five target subject areas over five years, and the factors that may influence student participation. These participation statistics form the background against which assessment outcomes are being investigated. Of particular interest will be the profile that is being developed of the student groups that are participating in the target subjects. The work that is being done to address Aims 1-3 will supplement and update the considerable statistical information that already exists about national participation rates in particular subjects.

Aims 4 - 8 focus on the performance outcomes of students. To address these research questions, statistical data on the performances of students overall, as well as a question by question breakdown of marks (where available), will be investigated. The relationship between performance and the particular features of question types and question nature will be established, through investigation of examination papers and other assessment procedures.

Aim 9 involves gathering information from: related research; examination papers and assessment documents; syllabus statements; and students and teachers themselves. Within South Australia, a longitudinal study is being conducted with both teachers and students. This study is seeking information about background factors affecting student participation and performance in subjects and, more specifically, about assessment issues within the target subjects.

Aim 10 seeks both specific and generalisable outcomes that can be used by assessment authorities to review policy and practice in relation to equity issues.

Methodology for all of the Aims has been developed and put in place, and work is progressing steadily on the production and interpretation of data from all of the Australian states. The aims are being investigated to differing depths in each state, according to the kind and detail of data available and the particular focus of each aspect of the Project. It should be noted that the quantity of data held by each of the assessment authorities is considerable, and this has enabled the research team to consider a very large sample size.

The subject areas to be investigated through the research questions are: Chemistry, Economics, English, Geography, and Mathematics, for the years 1987-1991. These subjects were selected because they will best provide generalisable outcomes to inform policy and practice. Representatives from each of the Australian Curriculum Assessment and Certification Authorities, and the National Steering Committee, established to oversee the Project, contributed to the choice of subjects.

Characteristics of Assessment Questions and Procedures

Nature and Type of Examination Questions

The language of examination questions is socially, academically and historically constructed and students in the 1990s have differential access to it. The ESSSA Project seeks to identify factors that contribute to differential gender outcomes in performance at Year 12 level. Some of these factors may relate to the wording and types of examination questions.

The ESSSA Project derived the initial categorisation of examination questions by nature and type of question from Hilary Whitehouse's SSABSA Report, Girls and Year 12 Science Examinations. This work defined question

nature and considered what questions asked students to do: to recall facts or methods from memory; to use and apply knowledge within given contexts; to calculate mathematically; and to use or present material in diagrammatic form. Later, questions that involved more than one category (or 'cross-category' questions) were added, to accommodate the questions in recent SA Year 12 Physics examinations. The type of examination question referred to the form of the written questions, for example: multiple choice, structured, and essay questions. Initially no degree of difficulty was identified within the different question types.

Various other existing taxonomies and categorisation schemes for the purpose of describing question characteristics have been researched by the Project team. However, none has been seen as comprehensive enough to facilitate a detailed linguistic description of the characteristics of

questions. Therefore, a taxonomy pertinent to equity assessment research has been developed to conduct the detailed analysis of question characteristics. This taxonomy followed extensive mapping and describing of examination questions across the five subject areas. It will be used in conjunction with quantitative data on student performance on a question by question basis in examinations.

There is little published national research which focuses on the possible effects of the nature and type of examination questions on the performance outcomes of students. Therefore, this work is seen to be particularly important in informing the policy and practice of assessment authorities.

Other Factors within Examination Questions

The ESSSA Project focuses on the interaction between gender and language in examination questions. After extensive research on available and relevant taxonomies and classifications, the Project has developed a proforma sheet for classifying assessment questions in relation to identified factors that potentially affect equitable outcomes for students. This proforma sheet is being trialled by various groups of subject experts, language experts and State reference groups in order to refine its design. So far, the main categories included on the proforma sheet are:

- . topic
- . concepts embedded in the question
- . language used

e.g. - vocabulary

- syntax
- semantics
- . context
- . person(s) mentioned
- . question format familiarity
- . answer format.

Features of the language of examination questions such as vocabulary, syntax and semantics can affect the performance of students differentially.

Vocabulary that is familiar, non-sexist and integral to the question facilitates student perceptions of the task that is required of them in response to an examination question. Where subjects have their own language, such as the precise meanings of the vocabulary of Mathematical questions, students' access to this may be influenced by their cultural background, sex, or past specific instruction on the language at the school level. Other features of vocabulary that can affect the performance of students differentially are: the logical structures inherent in instruction words such as 'describe' and 'evaluate'; as well as the simplicity or complexity of the vocabulary included.

The complexity and cohesiveness of the question format may be influenced by the syntax or structure of the question. Sometimes the syntax involves diagrams, graphs, tables or maps, and sometimes information given in one form (e.g. written text) needs to be transformed to another form (e.g. diagram) in order that the question be successfully tackled.

Certain question structures are traditionally found in the examination papers of particular subjects, and the performance outcomes of students on these needs to be examined more closely. Many aspects contribute to the semantics or meanings inherent in examination questions. Some of the main features that affect question meaning seem to be: the presence of unnecessary information or 'noise'; the use of the passive voice; negative phrasing of questions; the amount of complexity present (e.g. the presence of clauses and phrases that use many pronouns whose reference may become lost); and the general familiarity or predictability of the meaning, based on students' experiences within the curriculum.

Another factor of examination questions that may influence student performance is the degree of match between question format and answer format. For example, an answer may require the circling of one number in a multiple choice selection, but the stimulus may be in the form of a complex essay that requires visualisation, analysis and synthesis skills for its comprehension before the correct answer can be selected. Some mismatches in question format and required answer format may be problematic for some students.

Using the proforma sheet as a basis, examination questions are being described, analysed and, at times, reconstructed. Tentative explanations for significant difference in female and male performance on particular examination questions are being generated. At times, the wording of examination questions certainly does appear to influence the level of student performance demonstrated. Because students rely on their understanding of examination questions as the basis from which to demonstrate their knowledge, understanding and skills, more research is needed on how the same topic material can be assessed using a variety of question wordings, and the effects of such different wordings on students.

Conclusion

It is only recently that gender values embedded in the curriculum have been revealed and challenged. The values embedded in assessment require similar scrutiny. This review may impact on accepted practices and procedures in assessment so that more students can best demonstrate knowledge and

ability. With greater numbers of students staying on at school to gain secondary qualifications which provide access to further education, training, and employment, the impact of this research has the potential to influence and change gender differentials in participation rates in the

tertiary sector and employment.

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References

Cassels, J. R. T. & Johnstone, A. H. (1984), 'The effect of language on student performance on multiple choice tests in Chemistry', *Journal of Chemical Education*, 61(7), 613-15.

Department of Education, Queensland, English Language Development Across the Curriculum: Features of Mathematics and Science, Immigrant Education Services, Division of Special Services, Department of Education, Queensland.

Jones, John (1980?), *Writing, Setting and Marking Essays*, Higher Education Research Organisation, University of Auckland, New Zealand.

Walkerdine, Valerie (1992), 'Reasoning in a Post-Modern Age', Paper for the Critical Thinking Conference at Townsville, University of London, July.

Whitehouse, H. & Sullivan, M. (1990/1992, in press) *Girls and Year 12 Science Examinations*, Senior Secondary Assessment Board of South Australia.