ADELIA CARSTENS

The problem-solving potential of text evaluation

Examination papers in the spotlight

Keywords: assessment, examination papers, education, evaluation, instructional texts, style-sheet, text quality.

Examination papers have until now received little attention in the field of document design. This text type was identified as a possible source of academic underachievement among a group of South African technical college students from certain cultural and educational backgrounds. In this contribution examination papers are situated within a general model for problem-based text evaluation, representative of current thinking in document design. At a more specific level criteria from the domain of education are identified and validated. These criteria are mapped onto the textual elements of documents (content, structure, style and presentation) and represented in an *evaluation matrix*. The applicability of the matrix as a diagnostic tool is demonstrated through the analysis of a selection of examples from national examination papers for career-oriented college subjects. It is suggested that any pretesting - text-focused, expert-focused or reader-focused - be preceded by thorough planning, taking cognizance of the macro-context of problem-based document design, elements of the micro-context as outlined above, and appropriate research methods. The outcomes should yield useful dividends of a practical as well as an academic nature.

1. Introduction

1.1 Examination papers as instructional texts

In this contribution an examination paper will be regarded as a document administered as an evaluation instrument for measuring a candidate's ability to demonstrate the requisite knowledge, skills, attitudes and values in a specific field of study at the end of a certain period of learning.

Educational texts – examination papers in particular - have until now received no attention within the framework of document design. Although examination papers may be classified as a sub genre of instructional texts they do not feature in discussions and classifications of instructional texts. The reason may be that most other instructional

documents are associated with concrete products such as household appliances (usage instructions), computers (computer manuals and on-line help) and medicines (patient package inserts) (cf. Maes et al., 1996; Schellens & Maes, 2000). On the other hand, substantial research has been done on the compilation of forms; and forms are instructional texts also focusing on processes rather than products (cf. Jansen et al., 1989).

A second possible reason for the exclusion of examination papers from the domain of document design may be the fact that the process of assessment has traditionally been associated with education and training, and that assessment documents have therefore not been subjected to close scrutiny within the domain of language, communication and information.

This contribution aims at "drawing in" examination papers under the umbrella of document design, thereby making a cross-over between two professional and scholarly disciplines - i.e. document design and testing in an educational context. This is done by applying a model by Sanders et al. (1994) at the macro planning level, and identifying general as well as genre-specific criteria for text analysis at the micro level.

1.2 Problem-based approach

By its nature and definition document design is a reader-focused, problem-solving activity (cf. Schriver, 1997:10-11). Research in this field should therefore primarily be aimed at solving textual problems to fulfil user-needs. The problem that informed this research has its origins in the South African school system where English is the preferred medium of instruction and assessment for the majority of black students in secondary schools and technical colleges. According to statistics from the Department of Education and Training (quoted by Webb, in preparation, p. 178) approximately 90% of the students either started their schooling in an African language with a gradual transfer to English or were taught in English as from grade 1. Yet the majority of school leavers are not functionally literate in English (cf. Webb, 1999, pp. 18; Webb, in preparation, p. 176).

There are significant differences between the scholastic achievement of secondary school students taught in their mother tongue and students who are both taught and assessed through medium of a second language (cf. Webb, in preparation, p. 177; Manyane, 1998, pp. 1-13; Carstens, 1999, pp. 4-6). Compare the pass-rates for Science and Mathematics as percentages in the Std. 10 examination (Webb, in preparation, p. 177):

	Science	Mathematics
Black candidates	53	27
Coloured, Indian and white candidates	97	85

Table 1: The comparative pass-rates for Science and Mathematics in 1993

One could assume that the majority of white, coloured and Indian candidates received their schooling through medium of their mother tongue (Afrikaans or English), whereas most of the black candidates received their schooling in a language other than their mother tongue (English).

The low pass rates in black schools are alarming in terms of their devastating effects, of which four may be singled out: the huge annual financial loss for the South African government; the enormous waste of ratepayers' money; irreparable damage to the self-esteem of the students; and the failure to produce significant numbers of skilled workers who could have made a positive impact on technological and economic development in the region.

The educational sector on which I focus in this contribution is that of the technical college. In South Africa these institutions provide career-oriented training to school-leavers who have completed Grade 9. English is the preferred language of learning, used by approximately 85% of the students. Similar to the situation in academically oriented secondary schools, the pass rates are extremely worrying. Compare, for instance, the pass rates in Chemical Laboratory Technology, Industrial Chemistry and Terrain Planning for Grade 11 in 1999:

Subject	Pass rate
Chemical Laboratory Technology N2	45,5
Industrial Chemistry N2	28,3%
Terrain Planning N2	21,6%

Table 2: Pass rates for certain technical subjects in grade 11 (Technical College)

According to Webb (1999, p. 18) these figures "point to language [the language of instruction – AC] as a contributory factor in the unsatisfactory acquisition of appropriate knowledge and the poor development of cognitive, affective and social skills". I agree with him (see Webb, in preparation, pp. 186-190) that the inadequate second-language (English)

proficiency of the majority of these students is one of the major stumbling blocks in their cognitive development, and consequently also in their poor scholastic achievement. I do, however, believe that there are also other factors impeding the learning process, such as the culture of learning in the community; social class; the home environment; the literacy level of parents; urban vs. rural environment; the motivation of learners; the quality of teachers; the social meaning of the languages used (cf. Fasold, 1984, p. 293 ff); the quality of educational materials; and the conventions of assessment. Lam (1991, p. 126) quotes research indicating that the low level of acculturation into mainstream society has denied limited English proficiency students (across the world) equal access to educational and economic opportunities "because they are handicapped in test taking". This handicap may be due to being unfamiliar with test-taking procedures but could also be attributed to ambiguous or confusing instructional stimuli. There is sufficient evidence from moderators' reports that students do not understand the questions and interact with the examination paper in unconventional ways.

One of the avenues that might be explored to address the poor scholastic achievement of these students is to improve the accessibility of examination papers. In the following section the problem of inaccessible examination papers will be situated within a model for the evaluation of text quality, with special reference to educational texts.

2. A problem-based approach to improving text quality

2.1 A model for the evaluation of text quality

Sanders et al. (1994, p. 13) adopt a problem-driven, process approach to text evaluation (and design). They suggest that the problem of texts that "do not work" should be addressed by firstly looking into the goals the writer or the organisation wishes to attain (contextual analysis), exploring the expectations, needs and problems of the reader (reader research), determining whether the text is compatible with writers' goals and readers' needs (text analysis), and establishing the effectiveness of a new adapted version of the text (evaluation research). Their approach, which is consistent with current thinking in the field of text design and evaluation, is schematised as follows (Sanders et al., 1994, p. 14):

Figure 1: Problem-solving in text design

In the following paragraphs the model is explicated with regard to the situation outlined above.

2.1.1 Phase 1: contextual analysis

In a contextual analysis the researcher should ask questions such as: What are the aims of the organisation with these texts? How are the texts produced? Who is the target group? (cf. Sanders et al., 1994, p. 14). In the following paragraphs these issues are addressed.

Organisational aims

The principal aim of an examination is the assessment of learners. Hymes et al. (1991, p. 69) define assessment as "the process of obtaining information that is used to make educational

decisions about students, to give feedback to the student about his or her progress, strengths, and weaknesses, to judge instructional effectiveness and curricular adequacy, and to inform policy." The term assessment, then, is the umbrella that covers a variety of data collection procedures that are used in evaluating educational outcomes (Chase, 1999, p. 4). In the educational context a distinction is often made between formative assessment and summative assessment. *Summative assessment* is used to determine the success of a section of instruction. Final tests for a grading period, assessments at the end of a unit (tests, term reports, summaries of portfolios) and end of the year assessments are all typical sources of summative data. They rely on a broad sampling of the relevant content (Gipps & Murphy, 1994, p. 261; Chase, 1999, p. 97). *Formative assessment* refers to testing during the course of a unit of learning, aimed at diagnosing problems a learner or learners might experience and at influencing how and what is learned as the course proceeds (cf. Desforges, 1990, p. 5; Chase, 1999, p. 97).

Summative assessment is not only aimed at summarising a student's achievement at the end of a course or period of schooling but is also used for managerial purposes – to select and certificate students (Desforges, 1990, p. 4). The main aim of the Directorate for National Examinations of the Department of Education and Training is to conduct summative evaluation at the end of specific programmes to ensure that its policies are being enacted and that standards are being maintained or, preferably, enhanced. It needs information on pupils' achievements if it is to carry out its duty of ensuring that the system is working properly.

Another goal of summative evaluation (which ties in with the certification function) is to supply information to third parties. Employers ask for information about school-leavers so that they can make judgements about their employability and about placement within an organisation.

A certifying organisation such as the Department of Education and Training has the obligation to provide accurate information on the knowledge, skills values and attitudes of each candidate. Let us assume that an employer wants someone with basic knowledge of chemistry and experience of simple laboratory techniques. He/she also expects the person to go on further training courses to develop the special skills needed in the laboratory; someone who is willing and able to learn advanced technical skills. A student's grades should therefore be a concise, reliable statement on his/her specialised abilities. However, if the examination paper is not fully accessible to the student his/her grades will not be a true reflection of the knowledge and skills acquired during a particular period of schooling.

Text production

An examination paper is a an intertextual document. Firstly, it is situated within an entire curriculum, i.a. consisting of a clearly outlined syllabus containing *learning outcomes*, an outline of the *learning content* and a description of *assessment standards*, which, according to the Report of the Review Committee on Curriculum 2005, is: "to describe the expected level and range of performance for each of the learning outcomes for each grade level" (2000, p. 98). The learning content is expounded in one or more text books or summarised in the format of standardised notes. Support aids include work books for purposes such as focus and elaboration, class lessons for explication of concepts, practical sessions for applying knowledge and skills in a simulated environment and test papers that both serve as diagnostic instruments for teachers to determine whether learning has taken place, and as the basis for remedial work. The process of learning and teaching culminates in certification, which is the outcome of summative assessment by means of examination papers. The macro-context within which the examination paper is situated, may be schematised by figure 2 below:

Figure 2: Text types in the educational context

National examination papers are not only intertextual, but also the result of collaborative writing. The primary author of the examination paper is the (chief) examiner whose name appears at the top of the examination paper. This person is normally a subject-field expert who has been involved in teaching a certain subject at a specific level for a significant period. He/she is formally appointed by the Department of Education to compile a paper together with a panel of subject-field experts. Then there are the editors. Although their domain of specialisation is language, they assume final responsibility for the correctness of the paper in terms of structure, content, style, and content. They are less than authors but more than mere scribes (cf. Fairclough, 1995, pp. 78 ff.) in that they have the capacity to change the original wording, layout and structure in order to comply with organizational policy, anticipated reader's needs, and practical constraints.

Target group

In the situation analysed with regard to this contribution we have narrowed down the target group to South African students who have chosen to leave the formal, academic school system after having completed Grade 9 in order to receive career-oriented education and training of a technical nature. As already mentioned, they are predominantly speakers of African languages who receive training through English - a medium in which the majority have very limited communication skills – and that the failure rate is above 50%. This target group differs from mainstream students in attitude, prior knowledge, information needs, processing capacities, etc., making special demands on the packaging of information and the presentation of the message.

Context of use

Examination papers are used in a highly formal context where no disambiguating tools are available, such as a teacher who is willing to clarify the meaning or scope of a question. Moreover, text interpretation and the written response have to take place within a limited time frame. These factors may arouse abnormal levels of anxiety, causing students to perform below their true level of competence. If at least one of these variables, e.g. the examination paper, could be manipulated to such an extent that it becomes more accessible, students' opportunities to perform better could be enhanced.

2.1.2 Phase 2: reader research

The term 'reader research' is problematic in that it may be used to refer to "an investigation into readers' goals, needs and problems", as reflected by above model (Sanders et al. 1994), but may also serve as an abbreviation for "reader-focused text research" (cf. De Jong & Schellens, 1997). Authentic reader research will have to include an inquiry into aspects such as metacognitive and affective thought processes as well as attitudes (Wittrock & Baker, 1991, p. 3). One of the research methods that could successfully be implemented is the attitude questionnaire (Schellens & De Jong, 1997, p. 423). Reader-focused text evaluation is aimed at how the reader interacts with and reacts to a text by interpreting different text features, and is discussed in 2.1.3 below.

2.1.3 Phase 3: text analysis

Text analysis is a cover term for all the research activities that have to do with evaluating the key elements of the text (or the document as a whole) and how they relate to the goals of stakeholders such as the commissioning organisation, the writer (often a representative of an organisation) and the reader. According to the focus of the research Schriver (1989, p. 38) categorizes "typical methods for evaluating text quality" into three general classes: *text-focused*, *expert-judgement-focused*, and *reader-focused*.

Text-focused evaluation is normally a review of one or more texts by an expert in document design, according to certain predetermined criteria. Main objectives would be to evaluate the textual characteristics, namely *content*, *structure*, *style* and *layout*, in relation to genre conventions and user-needs.

Expert-focused evaluation is aimed at subject-field specialists and possibly document designers with expert knowledge of a particular document type. In the case of examination papers this could be a teacher, a subject advisor, an experienced examiner or a language editor dealing primarily with examination papers.

Reader-focused text evaluation concentrates explicitly on the reader-text relationship – in particular, on a complex of text features often referred to as *usability* or *effectiveness* (Schellens & De Jong, 1997, p. 404). According to Schriver (1989, p. 238) reader-focused methods have relative advantages over other approaches. In terms of examination papers one could for instance assert that research would be worthless without some input from the subjects. Pivotal research questions are: What is the most effective format for questions in examination papers? What problems do readers encounter when they answer the questions (in other words what factors impede the accessibility of an examination paper)?

Although the researcher could make intelligent guesses about the kinds of problems users might experience when interacting with an examination paper it would probably be wise to start with a reader-research tool that facilitates *troubleshooting*, i.e. locating and diagnosing the problems that readers have with the text (Schellens & De Jong, 1997, pp. 405; 407). The *plus and minus method* (cf. Maes et al., 1996, p. 187 ff.; Schellens & De Jong, 1997, p. 425; Schellens & Maes, 2000, p. 179). combined with focus groups (Schellens & De Jong, 1997, p. 422) could be a useful method for reader research in the domain of examination papers.

Phases 4 and 5 will not be discussed here as they will rely on the results of the first three phases.

2.2 Application of the model

This contribution departs from the premise that a substantial amount of research has been done in South Africa on the context in which the examination papers in question are being used (cf. Webb, in preparation), and that Phase 1 of the model does not need to be replicated. Phases 2 and 3 are the critical phases, and the outcomes of these phases will be crucial for the success of subsequent research. Moreover, constructing a research design that makes a cross-over between two professional domains will require an intimate knowledge of both domains. It therefore seems sensible to conduct a preliminary survey in which relevant criteria from the perspective of student assessment in education and the perspective of text evaluation in document design are outlined and diagnostically applied to a number of prototypic samples before an attempt is made at the research of phases 2 and 3. And this is the modest aim of the current study.

In section 3 criteria for the evaluation of examination¹ papers are distilled from literature on assessment and evaluation in the educational sector as well as literature on general characteristics of texts from the field of document design.

3. Criteria for the evaluation of examination papers

The instrument that is regularly used to facilitate summative evaluation of students is the examination paper. From a document design point of view examination papers contain informative as well as instructional elements. They are informative while they supply a sufficient amount of information to trigger the knowledge and skills that are to be demonstrated and assessed: encyclopedic, procedural, etc. They are, however, predominantly instructional in that their "primary goal is to [...] help readers (or users) to solve a concrete

problem, or to execute a specific task" (Jansen & Maes, 2000, p. 236). More specifically they assist students to demonstrate the requisite knowledge, skills values and attitudes.

From the domain of education "The most important feature of any examination is [its] validity" (cf. Bot 1995, p. 39). Validity implies that the test should "measure what it is supposed to measure" (i.e. the requisite outcomes), and all criteria invoked to measure these outcomes have to answer to the criterion of validity. Experts in education are, however, not unanimous on the set of criteria that underpins validity. Moreover, these criteria apply to **the process of assessment** rather than to the instruments or stimuli that are administered. After careful consideration the following criteria for examination papers were distilled from current literature:

- *Appropriateness/practicability*: Appropriateness in terms of examination questions means that they have to "meet the purposes for which they are to be used and that are appropriate for the intended test-taking populations" (Hymes et al., 1991, p. 28); and contain no irrelevant or unnecessarily complicated material (i.e. is at the appropriate level of readability (Desforges, 1990, p. 17; Bot, 1995, p. 45).
- *Clarity*: Instructions should be non-ambiguous, and the scope of the answer should be indicated clearly in the question. The candidate should be told exactly what is expected and what will get credit (Desforges, 1991, p. 19; Bot, 1995, p. 43).
- *Correctness*: It is assumed that correctness is a non-negotiable characteristic of all educational texts. It applies to factual information; the use of language; non-linguistic symbols, graphics and facts; and the quality of the proofreading. Desforges (1991, p. 65) is of the opinion that even printing errors may contribute towards shattering "the fragile nerves of some unfortunate candidates".
- *Coverage/weighting/comprehensiveness*: It is important that the curriculum should be covered in terms of depth and breadth but should not contain questions on material which had not been covered (cf. Hymes et al., 1991, p. 24; Desforges, 1991, pp. 29-31; Bot, 1995, p. 39; p. 45; Chase, 1999:97).
- *Diversity*: Diversity has to do with whether the full abilities of the student are assessed. (Hymes et al., 1991, p. 24).
- *Ecological validity*: Examination questions that evaluate applied competence are ecologically valid if they require performance of a task in a situation that most closely matches the standards and challenges of real life (Hymes et al., 1991, p. 28).
- *Equity*: Equity implies fairness towards all the candidates who sit a particular examination, namely students of different races, gender; ethnic backgrounds, or

handicapping conditions (Hymes et al., 1991, p. 28; Poortinga, 1995, pp.188-189). In other words aspects such as adequate knowledge of the testing language, familiarity with stimulus materials, and the way in which a particular problem is presented (Poortinga, 1995, p.p. 189) have to be considered carefully.

- *Importance*: Importance has to do with the extent to which fundamental, important things in the curriculum are assessed (Hymes et al., 1991, p. 25). Desforges' advice in this regard is to the point: "Test for important ideas rather than trivia" (1991, p. 17).

Although these criteria may be equally important, not all of them are applicable in every research design. The following matrix presents a rough summary of the criteria that are appropriate for a particular type of evaluation, and the textual level(s) at which this criterion will be prominent, is specified:

Criterion	Focus of the evaluation T=Text R=Reader E=Expert (t)=text expert (c)=content expert	Textual level				
		Content	Internal structure	Outer structure	Style	Presentation
<i>Appropriateness</i>	T, R, E (t)		x	x	x	x
<i>Clarity</i>	T, R, E (t)	x	x	x	x	x
<i>Correctness</i>	E (c & t)	x		x		
<i>Coverage</i>	E (c)	x				
<i>Diversity</i>	E (c)	x				
<i>Ecological validity</i>	E (c)	x				
<i>Equity</i>	R				x	x
<i>Importance</i>	E (c)	x				

Table 3: Evaluation matrix for assessment documents

In the next section a number of examples from external examination papers for grades in technical subjects for Grades 10 and 11 will be discussed in relation to the different textual levels, i.e. *content*, *structure*, *style* and *presentation*, using the criteria identified above as guiding principles.

4. A level-based evaluation of examination papers

4.1 Content

Content is a subject-related and a syllabus-related matter. It is therefore difficult to provide guidelines on how it should be treated in examination papers. The criteria of *ecological validity*, (*balanced*) *coverage*, *importance* and *diversity* do, however, seem to be relevant here. The examiner (as an expert) should ask him-/herself questions such as:

- Have I focused on knowledge, skills, attitudes and values that constitute the core of the subject field (diversity and importance) and that address real-world problems (authenticity)?
- Have I covered the entire syllabus – corresponding to the relative weights of topics (balanced coverage)?
- Have I given sufficient contextual cues in each question for the student to know exactly which conceptual domain he/she has to refer to and how much information should be included in the answer?

Take for example the following short essay question: "Explain in not more than 400 words how a fire extinguisher works" (Desforges, 1990, p.19). Although the question seems straightforward there are different kinds of extinguishers – water, soda/acid, CO², etc. Moreover, the candidate would want to know what will count as an explanation? Does the examiner simply want the operating instructions, or does he/she require an account, complete with equations, of the physical and chemical changes in fire-fighting? Desforges (Ibid.) is of the opinion that if candidates are not told, they will make different choices and this makes marking very difficult. He adds: "Worse, most students will make mixed choices – that is, they will tell you bits and pieces about everything." This makes fair marking virtually impossible.

The above essay question would be much clearer if formulated as follows: "Explain how the soda/acid fire extinguisher works. Show in your explanation the equations describing the chemical actions which take place when the extinguisher is used."

In questions such as the above it is important to indicate whether the student should focus on declarative information (how the system works) or procedural information (how the user has to operate the system).

4.2 Structure

Structure refers to the way in which information is ordered in a text (internal structure); and to the way in which the reader is assisted to determine if and how different parts of the text are related (outer structure) and what their relative importance is. The principle of *clarity* will therefore play an important role. In this contribution I shall focus primarily on aspects of outer structure.

4.2.1 Relationships between different parts of the document

In the paper on SPECIALISED ELECTRICAL INSTALLATION CODES it is not always clear in which way higher order information is related to lower order information (i.e. in which way information or instructions contained in the main question is relevant to sub questions). Compare QUESTION 1 in this regard:

QUESTION 1

Define the following electrical installation regulations and requirements:

- (a) Responsibility of an accredited person
- (b) Issuing of a Certificate of Compliance:

Name all the requirements with reference to the following aspects only:

- (i) Additions and/or alterations to the installation
- (ii) Faults or defects detected prior to issuing a Certificate of Compliance (C.O.C.)
- (iii) For how long is a C.O.C. valid?
- (iv) Where defects constitute an immediate danger to persons where electricity is already supplied
- (v) Is a C.O.C. transferable from one user to another?

SABS 0108/1995: THE CLASSIFICATION OF HAZARDOUS LOCATIONS AND THE SELECTION OF ELECTRICAL APPARATUS FOR USE IN SUCH LOCATIONS.

- (c) Fully describe the general scope of the above-mentioned code.
- (d) This code does not cover locations that are rendered hazardous due to two main conditions. Fully state these TWO conditions.
- (e) Define ONE of the following:
 - (i) Ex m apparatus
 - (ii) Ex s apparatus

One may question the relationship between the instructional verb *define* in the main question, and secondary instructional verbs that govern embedded questions such as (b) [with its tertiary questions (i) through (v)]; (c); and (d). Sub-question (b) is problematic in itself as (iii) and (v) are interrogatives, and the "instruction" seems to be unrelated to the "higher" verb *name*. Complex questions such as this could have been much clearer if the secondary and tertiary questions had each contained their own instructional verb, giving an exact indication of the scope of each answer. The cognitive load and time spent on interpretation could have been decreased significantly if each sub-question had been self-contained.

4.2.2 Headings and subheadings

According to Hartley (1985, p. 57; cf. also Jansen & Steehouder, 1989, p. 137) headings are aimed at summarizing the content of the text. They also help to structure information (orientational function); to search for information (search function) and to decide what to read and what not to read (selection function).

In examination papers the primary function of headings and subheadings is to orientate the reader. They label the sub-parts of the text so that the reader knows where he/she is and where he/she is going (in other words they act as entries on a kind of site map). Main headings normally divide the text into functional units, such as GENERAL INSTRUCTIONS, REQUIREMENTS, NOTES, etc. The numbers of questions serve as subheadings (e.g. QUESTION 4), and their primary function is to divide the text into more or less self-contained units of assessment. In terms of Renkema's CCC model (1998, p. 40) consistency is very important here. Not only do headings facilitate harmony between text and layout, but they also facilitate a consistent build-up of the text.

Moreover, the hierarchy of the text is made explicit by headings, and this function is normally supported by layout (indenting) and typography (section numbers could be printed in a bigger font size and other font type than question numbers).

The following example demonstrates the application of some of the above marking devices. It is, however, suggested that attention be given to the functional use of different font types and weights for headings and body text:

SECTION D

QUESTION 10

SABS 051, PART II: THE INSTALLATION, WIRING AND USE OF ELECTRICAL
EQUIPMENT IN ANAESTHETIZING AND SIMILAR LOCATIONS

- (a) Name and discuss the locations in a hospital classified as hazardous and the extent in each case.
- (b) What are the general requirements regarding the use of control devices in hazardous locations?

In the paper on SPECIALISED ELECTRICAL INSTALLATION CODES capitalised heading-like entries serve a specific orientational function, namely to indicate the conceptual scope of the questions or sub-questions dominated by them. They also facilitate coherence. In the above example an SABS (South African Bureau of Standards) installation code serves as a scope-delimiting heading. In the following example the headings indicate the subtopics to which the questions below them refer. They also facilitate economy in that the scope does not need to be repeated in each question:

QUESTION 7

QUALIFICATIONS OF MAINTENANCE PERSONNEL

- (a) Name FIVE requirements deemed necessary to satisfy the above statement.
- (b) Name FIVE restrictions that must be adhered to when maintenance work is carried out in hazardous areas on electrical apparatus.

POWER SUPPLY SYSTEMS

- (c) Describe a general TN power supply system and the THREE types of systems that are based on the principle of a TN power system
- (d) Name the prohibitions with the use of the systems as mentioned in QUESTION 7(c).

4.2.3 Numbering

The sequence of information in a text is often supported by a numbering system. However, according to Hartley (1985, p. 63) not much research has been done on the efficiency of different numbering systems.

The Department of Education and Training seems to allow a measure of freedom to compilers as regards the choice of a numbering system and a numbering hierarchy – in other words no uniform numbering system or style is prescribed. The following practices seem to be followed:

- (i) **General instructions** preceding the actual questions are sometimes numbered by using uppercase alphabet letters (A, B, C, etc.), and sometimes Arabic numbers (1, 2, 3, etc).

- (ii) **Main questions** are numbered from 1. onwards;
- (iii) **Embedded or sub-questions** follow different patterns: in some cases a hierarchy of Arabic numbers up to three digits (e.g. 1.1.1) is used; in other cases primary Arabic numbers are followed by bracketed, lowercase alphabet letters [(a), (b), (c)], etc., which are followed by lower case Roman digits [(i), (ii) (iii)], etc.; and in others primary Arabic numbers (1, 2, etc.) are followed directly by lowercase Roman digits.

One could argue that the choice of a numbering system will not impact on the quality and accessibility of a text as long as there is consistency throughout one examination paper. On the other hand it could be argued that the more predictable the format of a paper is, the lower the cognitive load will be, thereby allowing the candidate to pay undivided attention to the main focus, which is demonstrating internalised knowledge and skills.

An important criterion for the use of headings and numbering is consistency. In the examination papers of the DET tables are numbered and captioned somewhat arbitrarily. The paper on SPECIALISED ELECTRICAL INSTALLATION CODES for instance contains four tables, of which only two have been numbered (as TABLE B and TABLE C respectively). TABLE B (centre aligned) bears no caption, whereas the first table (not numbered, but presumably A) bears the caption RELATIONSHIP BETWEEN THE TEMPERATURE CLASSES, SURFACE TEMPERATURES AND IGNITION TEMPERATURES. Like the first table, the third has no number, but bears the caption NUMBER OF EARTH ELECTRODES REQUIRED FOR EACH MAIN STORAGE TANK. TABLE C (left aligned) is numbered and captioned MINIMUM SIZE OF COPPER TAPE FOR A (sic) EARTHING SYSTEMS.

This inconsistency may not have a significant influence on interpretation but as a result of the haphazard numbering and captioning candidates may waste time on trying to establish whether they have indeed included all the tables in the answer script. Moreover, they may not notice that a question has been overlooked.

4.2.4 Typography

Typography is a text element that plays an important role in the structuring as well as the presentation of a document. According to Schriver (1997, p. 250) typography and space work together to set the mood, look and feel of a text; explicate the structure; invite readers to scan and navigate the text in certain ways; give clues about the text genre; reveal what the designer and/or editor thought was important, etc.

An examination paper needs to be maximally accessible for all users. For examination papers appropriate use of typography therefore implies soberness and harmony between content and type. With regard to educational texts Hartley (1985, p. 60) contends that typography should not confuse the reader or divert his/her attention. So, while one may argue that using an old-fashioned work-horse font such as Courier is monotonous and unimaginative it could be confusing to the student if a variety of font types, different weights, variation in slant, etc., were introduced. It could be suggested to the DET that a sans serif font be used for heading type and a serif font, in a point size slightly smaller than that of the heading type, for the body text. However, any adapted format should be tested among a representative sample of candidates before the actual examination, and the tested version should then be introduced to all candidates to acquaint them with the new format.

As far as the marking of important words and passages are concerned Glynn (1985) (in Jansen & Steehouder, 1989, p. 142) distinguishes three functions, namely

- to focus the attention of the reader on certain words/passages, thereby influencing the extent to which the information is remembered;
- to explicate the difference between the "real" information and supporting information such as examples;
- to simplify searches in complicated tables and schemas.

It seems as if examination papers of the DET often use typographic marking to focus the attention of the candidates on important aspects. The marking is, however, somewhat confusing. In the paper on SPECIALISED ELECTRICAL INSTALLATION CODES both uppercase letters and underlining are used to mark emphasis. Compare the following examples:

- No condonation will be granted.
- The answers need not be word perfect in all respects according to the publications, but must show that the candidate fully understands the context of the relevant questions. (Any meaningful answer will be marked.)
- Give THREE main preferred arrangements where it is necessary to install a group of electrodes, with reference to the earthing leads.
- Name FOUR main GENERAL requirements for electrical installations in hazardous areas.
- Fill in only the correct missing technical term or phrase if the FOLLOWING RECOMMENDATIONS are made for the above.

- What is the single most important hazard recognized in an anaesthetizing location?

Another aspect of typography in the examination papers under scrutiny that calls for attention is the prolific use of all capital letters. It is a well-researched fact that text containing rows of uppercase letters is more difficult to read than the same text printed in lowercase and that reading speed is slowed by about 13 to 20 percent (Hartley, 1985, p. 78; Schriver, 1997, p. 274). With regard to examination papers it is recommended that font type, size and/or weight be used to facilitate contrast between subheadings indicating scope or topic, section headings and question headings. In this way formal distinctions will harmonize with functional distinctions (harmony between text and presentation) and promote accessibility.

4.3 Style

Style has to do with alternate formulations of the same content, and is inextricably intertwined with the text type and the user-group. In terms of our criteria it is primarily linked to *appropriateness* and *equity/fairness*. Equity entails that the text should not in any way be biased towards a specific group or sub-group sitting the examination; whereas appropriateness means that the conceptual content, wording and formulation should be at the required level of complexity for a specific grade (e.g. Grade 11) and proficiency level. Brief attention will be paid to wording and formulation.

4.3.1 Appropriate wording

There are mainly two categories of words that could be regarded as difficult, especially to learners who have to study through a second language, namely academic words and subject-field terms. Academic words constitute the general stock of words used in higher functions across different academic and technical fields, e.g. *appropriate*, *characterise*, *calculate*, *correspond*, *observation*, *establish*, *phenomenon*, *proportional*, etc. Subject-field terms are domain-specific words representing the concepts of a specific scientific or technical field, e.g. *oxide*, *ionic theory charge*, *electrolytic*; *chemical equation*; *beam filling*; *nailed trusses*; *granolithic*, *lintel*.

It is normally agreed that subject-field terminology is essential for exact scientific communication about and within a specific subject-field, and that substituting terms with synonyms or near synonyms may result in incorrect information transfer. Carstens (1998, p. 5) proved this point when attempting to simplify definitions for the *Quadrilingual Dictionary of Chemistry* - a learners' dictionary aimed at non-mother tongue speakers of English with

limited knowledge of the subject field (primarily Grade 11 and 12 students who are mother-tongue speakers of an African language but use English as a medium of learning and instruction). In a number of instances chemistry experts found the simplified definitions to be incomplete, insufficient or even incorrect. In educational texts the following guideline could be followed: Instead of using synonyms or paraphrases technical terms could be explicated by means of a short definition in brackets.

The situation is, however, slightly different with "general" academic words, of which the majority are of Greek and Latin origin. Corson (1997, p. 671) argues that "the Graeco-Latin vocabulary of English, which dominates the language's academic vocabulary, offers various levels of potential difficulty for students from different class, sociocultural or linguistic social functions. Teachers and lecturers seem to take for granted that students know these words, but in reality some students "do not get ready access to this vocabulary outside school, making its use inside schools doubly difficult" (Corson, 1997, p. 671). Hubbard (1995, p. 11) says in this regard: "It would appear that lecturers [we could assume that this is also true for teachers – AC] take trouble to explain their subject's jargon but simply assume that their students will have a good understanding of general academic words such as *sequence, interaction, empirical, function, phase, phenomenon* and the like."

Neither Hubbard nor Corson pleads for the substitution of these words with shorter, more familiar words. Hubbard (1995, p. 11), in fact, says: "To attempt to denude our lectures of these kinds of words would be to deny our students access to the very discourses they need to develop." In my opinion there may be sufficient arguments to deviate from this opinion in communicative situations where comprehension, communicative effectiveness and efficiency are more important than "qualifying" as a member of the academic fraternity. Access will be facilitated rather than denied when substituting these words with more familiar synonyms or paraphrases. The comprehension speed and ease of a non-mother tongue speaker will certainly be enhanced by using words such as *use* instead of *utilize*, *find out* instead of *ascertain*, *speed up* instead of *expedite*, etc.

A sub-category of the academic vocabulary, namely the so-called 'instructional verbs' and 'instructional clauses', pose a different kind of problem. These are the verbs and verbal clauses used to specify the scope and the quality of the answer expected from the student, e.g. *name, describe, discuss, explain, make a drawing/sketch, analyse, match*, etc. Generally spoken, the meaning is clear, but the scope of the presupposed answer is problematic. This uncertainty often leads to violation of Grice's maxim of quantity, causing the student to spend too much time on questions requiring a simple one-word answer, and vice versa.

Unfortunately this problem cannot be addressed in the examination paper. On the one hand students should be taught the meaning and scope of these words in the classroom. On the other hand national departments of education should provide examiners and language editors with a style sheet containing (i.a.) a list of the most frequently used instructional verbs and phrases, together with a brief definition of each, and a number of usage notes. This list should be distributed in all schools and colleges writing DET exams.

A greater awareness of the scope and meaning of instructional words and phrases could have precluded confusing questions such as the following:

SPECIALISED ELECTRICAL INSTALLATION CODES

SABS 051 CODE OF PRACTICE FOR THE PREVENTION OF EXPLOSIONS AND ELECTRICAL HAZARDS IN HOSPITALS

SABS 051, PART II: THE INSTALLATION, WIRING AND USE OF ELECTRICAL EQUIPMENT IN ANAESTHETIZING AND SIMILAR LOCATIONS

QUESTION 10

- (c) Name and discuss the locations in a hospital classified as hazardous and the extent in each case.

This three-in-one question requires of students to *name* the different locations, *discuss* each one, and *give an indication of the extent* of the hazard in each case. This question is problematic in more than one way: firstly the last part of the question has not been quantified by means of a verb or verbal clause (*name, indicate, etc.*). Secondly, *discuss* is a very vague instruction. No indication is given of the focus of the discussion: why the locations are hazardous, how the hazards could be minimised, etc.). In other words what type of information is required: evaluative or declarative?

In the following question one could question the different formulations of (i) and (ii). Consistency could have been facilitated by introducing the verb *calculate* in (ii) (*Calculate the total amount that should be budgeted for chemicals*), or by using an interrogative in (i) (*What is the current cost of chemicals per year?*):

WATER AND WASTE-WATER TREATMENT PRACTICE

SECTION D

6(a) (i) Calculate the current cost of the chemicals per year.

- (ii) What total amount should be budgeted for chemicals for the coming financial year if a flow increase of 2 000 m³ per day is expected?

In this case there may be a discrepancy between what action a student has to perform and what should be reported. Will marks only be awarded for the answer, or will marks also be awarded for the calculation?

In question 4 of the paper on **ENGINEERING SCIENCE** one could either interpret *determine* and *calculate* as synonyms (*calculate* giving a more precise indication of *determine*); or the question may be interpreted as instantiating an option (either *determine* or *calculate*):

QUESTION 4

4.1 Determine or calculate the magnitude and the nature of the forces in members AB and BC as shown in FIGURE 2 on the diagram sheet.

4.3.2 Appropriate formulation

During the 1970s and 1980s it became fashionable to predict the complexity of a text by means of readability formulae. These formulae typically combined two parameters: average word length and average sentence length (often expressed in the number of syllables). (cf. Hartley, 1985, p. 58; Schriver 1997, p.). These formulae are not necessarily reliable as some short sentences are difficult to understand, and some long sentences are clear because of their explicitness. Document designers and advocates of Plain English are however, unanimous in their advice to avoid long, complex NP's; passives, negation and complex constructions such as cleft sentences.

Consider sentences from QUESTION 9 of the 1999 Grade 11 paper on ELECTRICAL INSTALLATION CODES:

QUESTION 9 (e)

CATHODIC PROTECTION:

Internal Protection and Process Plant where a power impressed cathodic protection system is to be used for the protection of the internal parts of heat exchangers and other vessels that are situated within a dangerous area.

Fill in only the correct missing technical term or phrase if the FOLLOWING RECOMMENDATIONS are made for the above:

- (i) In order to avoid danger from sparking that may occur when the circuit is made or broken by the separation of an anode from the surface of the liquid, ensure that the circuit is ... isolated when the anode is not submerged. Equip each process area with

- a(an) ... cathodic protection installation, each having its own ... transformer-rectifier unit.
- (iii) Supply each item of process equipment by a ... circuit that incorporates an ammeter.
 - (iv) Install the direct-current supply from the rectifier as a two-wired ... system, with the positive pole of each circuit ... and the negative pole provided with a(an) ... making no ... on the supply side of the fuse or link.
 - (v) Connect any series of ballast resistors or variable resistors or both that are used for ... in the positive pole of the circuit on the . . . of the control switch and of the indicator lamp.

Apart from the length and complexity gap-filling questions such as the above have the disadvantage that the student first has to read the entire sub-question, and then return to the beginning to fill in the gaps (cf. Jansen et al., 1989, p.56).

4.4 Presentation

Presentation has to do with the way in which content (information/instructions) is graphically displayed in a document. In examination papers the visual presentation is of paramount importance for comprehensibility and support of the internal structure.

Due to their function and faithful to genre conventions examination papers are strongly fragmented texts. Information (instructions) is (are) presented in relatively small self-contained units. It is therefore a genre within which the principles of *Information Mapping* could successfully be applied. Layout (and typography) could ensure that easy access to functionally different text blocks such as general instructions (instructions on how to use the text), notes, questions, standardised codes, tables, graphs, charts examples, indicators of scope, etc. is provided. In other words the access structure could be improved significantly by manipulating the visual presentation.

Apart from the structure-enhancing function of layout, it also serves as a conventional matrix for presenting information. Readers have expectations about the layout of certain text types (cf. Hartley, 1985, p. 73), and problems are encountered when these expectations are violated.

If illustrations, tables, and other graphics are included in an educational text they should preferably appear on the same page as the referring question, and the orientation should ideally be the same for text and illustration. The candidate will then not waste valuable time on changing the orientation of the page repeatedly, and will be able to concentrate on the task and the application without interruption. Modern-day scanners and word-processing

programmes have made it possible to insert and manipulate graphics in a word-processing document without having to be an artist or a computer specialist. This means that there is no excuse for poorly designed documents.

In the examination papers of the DET illustrations and tables are often attached as annexures at the end of the paper, which normally have a landscape orientation as opposed to the portrait orientation in the main part of the paper. Moreover, the candidate has to move repeatedly from the question and the legend or key in the main paper to the answer sheet at the back of the paper. This is for instance the case in question 4 of the paper on SPECIALISED ELECTRICAL INSTALLATION CODES. The question reads as follows (to save space not all the codes have been included):

QUESTION 4

- (a) Refer to ANNEXURE E (Summary of type of protection and selection of apparatus).

Determine the approved and chosen requirements for the specific areas. Fill in all the open spaces by using only the following selected applicable different codes from A to Z.

CODES

- A As for flame-proof apparatus
- B Zone 0
- C Types of apparatus to which protection can be applied
- D Not suitable
- ...

All the information necessary to answer the question could have been copied onto the answer sheet by making use of the principles of Information Mapping (cf. Horn 1982; 1985). This could have been done by dividing the page into different blocks using a block for the actual question, a second block for the legend with codes and their explanations, and a third block for the answer sheet:

QUESTION	
K E Y	ANSWER

5. Conclusion

From a problem-solving perspective – which motivated this study – the outcomes of my investigation could be viewed as foundational for planning research on assessment documents in the field of document design. Departing from a macro-model, such as the one proposed by Sanders et al. (1994), the researcher could ensure that no important dimensions are omitted which could skew the research results. Micro-planning, in turn, should depart from a

structured overview of the important criteria that are valid for a particular document type; the textual levels to which these criteria apply; the focus of the research in terms of text, reader or expert; and the pretest methods most suitable for testing these variables (cf. Schriver, 1989; De Jong & Schellens, 1997). Pretests departing from the evaluation matrix proposed above, in combination with inventories of pretest methods (Ibid.), may produce worth-while dividends. It will help the researcher to ensure 'goodness-of-fit' (cf. Schumacher & Waller, 1985) between the instrument and the information the researcher would like to retrieve from the pretest.

The following example demonstrates this claim: According to the matrix an expert-focused text evaluation (**E**) (by a language editor for the education department or an expert in document design) should evaluate examination papers by applying the criteria of **appropriateness**, **clarity** and **correctness** to the *structure*, *style* and *presentation* of the document. An **editorial review** (cf. Schriver, 1989, p.242), using Likert scales, could be used. Compare the following example:

Correctness

The language is grammatically correct.

strongly agree 1 2 3 4 5 6 7 strongly disagree

There are typing/proofreading errors in the text

strongly agree 1 2 3 4 5 6 7 strongly disagree

Clarity

Instructions are clear and non-ambiguous

strongly agree 1 2 3 4 5 6 7 strongly disagree

Appropriateness

The style of the questions are appropriate for the user-group (not too simple, neither too complex)

strongly agree 1 2 3 4 5 6 7 strongly disagree

Equity

The paper is fair towards all test takers of different races, gender, ethnic backgrounds, and handicapping conditions.

strongly agree 1 2 3 4 5 6 7 strongly disagree

A qualitative dimension could be added to each question, in which respondents are requested to support their answers with examples from the text(s) at hand. These answers may be useful for building up an inventory of text-focused problems experienced by document design experts. Reader-focused research could follow a similar procedure, using the evaluation matrix as a starting point in the planning stage, and selecting a pretest method such as the plus and minus combined with focus groups.

At a practical level the outcomes of the (actual) research should provide sufficient evidence for language editors (document designers) of departments of education to compile

style-sheet parameters that could facilitate greater efficiency and effectiveness in their day to day work. Educationists and document design researchers may gain useful insights into the problems that student groups with low second-language proficiency as well as low encyclopedic (subject-field) proficiency may experience when sitting an exam. Evaluation research will have to verify whether redesigned versions of examination papers have indeed yielded more positive responses from students and other stakeholders. However, the litmus test will be whether redesigned examination papers have a significant impact on student grades.

NOTE

1. Assessment refers to the monitoring of the performances of students. Evaluation is the determination of the worth or value of an event, object (or sometimes an individual) in terms of a specified criterion (Chase, 1999, p. 4-5). In this contribution assessment is used with regard to the evaluation of students by making use of evaluation instruments such as examination papers; and evaluation is regarded as a measurement of the value of a text in terms of specific criteria.

REFERENCES

- Bell, Chris & Harris, Duncan (Eds.) (1990). *Assessment and Evaluation*. London: Kogan Page / New York: Nichols Publishing.
- Bott, P.A. (1995). *Testing and assessment in occupational and technical education*. Boston: Allyn & Bacon.
- Carstens, Adelia. (1998). On justifying the compilation of a multilingual explanatory dictionary of chemistry. *S.A. Journal of Linguistics*, 16(1), 1-6.
- Carstens, Adelia. (1999). Science through Sepedi: Is Terminologisation a Worthwhile Venture? *Lexikos* 9, 1-17.
- Chase, C.I. (1999). *Contemporary assessment for educators*. New York: Longman.
- Corson, D. (1997). The learning and use of academic English words. *Language Learning*, 47(4), 671-718.
- De Jong, Menno & Schellens, Peter Jan. (1997). Reader-focused text evaluation. An overview of goals and methods. *Journal of Business and Technical Communication*, 11, 402-432.
- Desforges, Charles. (1990). *Testing and Assessment*. London: Cassell Educational Limited.
- Fairclough, D. (1993). *Critical discourse analysis*. Longman: London and New York.
- Fasold, R. (1984). *The Sociolinguistics of Society*. Oxford: Basil Blackwell.

- Gipps, Carolin & Murphy, Patricia. (1994). *A Fair Test? Assessment, Achievement and Equity*. Buckingham/Philadelphia: Open University Press.
- Goffman, E. (1981). Footing. In *Forms of Talk*. Oxford: Basil Blackwell.
- Hartley, J. (1985). Tachtig manieren om onderwijsteksten te verbeteren. In G. van der Veen, (Ed.), *Onderwys in druk* (pp. 55-82). Utrecht: Kluwer.
- Hoeken, H. (1998). *Het ontwerp van overtuigende teksten*. Bussum: Coutinho.
- Horn, R.E. (1985)¹. Structured Writing and Text Design. In D.H. Jonassen *The Technology of Text*. Volume 2. Englewood Cliffs, NJ: Educational Technology Publications.
- Horn, R.E. (1985)². Results with structured writing using the Information Mapping Writing Service Standards. In T.M. Duffy & R. Waller (Eds.) *Designing uable texts* (pp.179-212). Orlando: FLP Academic Press.
- Hubbard, E.H. (1995). *Developing discourse: applied linguistics and academic empowerment*. Inaugural lecture, 29 August 1995. Pretoria: University of South Africa.
- Hymes, D.L., Chafin, A.E. & Gonder, P. (1991). *The Changing Face of Testing and Assessment*. Arlington: American Association of School Administrators.
- Jansen, Carel & Maes, Alfons. (2000). Document Design. *S.A. Journal of Linguistics*, 17(4), 234-255.
- Jansen, C.J.M. & Steehouder, M. (1989). *Taalverkeersproblemen tussen overheid en burger*. s'Gravenhage: SDU.
- Jansen, C., Steehouder, M., Edens, K., Mulder, J., Pander Maat, H. & Slot, P. (1989). *Formulierenwijzer*. s'Gravenage: SDU Uitgeverij.
- Lam, Tony C.M. (1991). Testing of Limited English Proficient Children. In K.E. Green, (Ed.), *Educational testing: issues and applications* (pp. 125-168). New York: Garland Publishing.
- Maes, Fons, Ummelen, Nicole & Hoeken, Hans. (1996). *Instructieve Teksten*. Bussum: Coutinho.
- Manyane, S.M. (1998). *Die gebruik van wetenskapsterminologie in die senior sekondêre fase*. Unpublished mini-dissertation), University of Pretoria.
- Poortinga, Y.H. (1995). Use of tests across cultures. In T Oakland & R.K Hambleton (Eds.), *International perspectives on academic assessment* (pp. 187-206). Dordrecht: Kluwer.
- Renkema, J. (1998). Correspondentie, consistentie en correctheid in schriftelijke communicatie. In V.G.M. Damoiseau, A.A. van Ruter & A. Weisink (Eds.), *Effectiviteit in communicatiemanagement* (pp.39-53). Deventer: Samson:

- Review Committee on Curriculum 2005. (2000). *A South African curriculum for the Twenty First Century*. Presented to the Minister of Education Professor Kader Asmal. Pretoria.
- Sanders, T., Sanders, J., Renkema, J. & Van Wijk, C. (1994). Praktijkonderzoek na tekstkwaliteit. *Communicatief*, 7(4), 13-22.
- Schellens, P. J. & Maes, A.A. (2000). *Tekstontwerp*. In A. Braet (Ed.), *Taalbeheersing als Communicatiewetenschap* (pp.185-189). Bussum: Coutinho:
- Schrivver, Karen, A. (1989). Evaluating Text Quality: The Continuum From Text-Focused to Reader Focused Methods. *IEEE Transactions on Professional Communication*, 32(4), 239-255.
- Schrivver, K. (1997). *Dynamics in document design*. New York: John Wiley & Sons.
- Schumacher, G.M. & Waller, R. (1985). Testing design alternatives: a comparison of procedures. In: T.M. Duffy & R. Waller (Eds.), *Designing uable texts* (pp. 377-403). Orlando: Academic Press.
- Steehouder, M., Jansen, C., Maat, K., Van der Staak, J., de Vet, J., Witteveen, M. & Woudstra, E. (1999). *Leren Communiceren*, 4th edition. Groningen: Wolters-Noordhoff.
- Van der Veen, G. (Ed.) (1985). *Onderwys in druk*. Utrecht: Kluwer.
- Van Es, M. (1985). Wat is een goede studietekst? In G. van der Veen (Ed.), *Onderwys in druk* (pp. 21-38). Utrecht: Kluwer.
- Webb, V.N. (in preparation). *The Languages of South Africa*. Amsterdam: Benjamins.
- Webb, Vic. (1999). Defining the linguistic aspects of educational performance. Workshop for language editors of the Directorate: National Examinations, Department of Education, 1 November 1999, University of Pretoria.
- Wittrock, M.C. & Baker, E.L. (Eds.) (1991). *Testing and Cognition*. New Jersey: Prentice Hall.