



UNIVERSITY *of* CAMBRIDGE
International Examinations

Inside the Black Box - How Learners Respond to Questions

Nicki Little





Introducing QWILT

- **Question Writers' Interactive Learning Tool**
- **Based on empirical evidence**
 - Analysis of samples of scripts
 - Trialling of different versions of questions
 - Post-test interviews with students
- **Psychological processing**
 - Mental processes involved in answering questions
 - Development of a model of the question answering process



Validity – a reminder

- ‘Fitness for purpose of an assessment tool or scheme’ (QCA)
- A good question is a valid question.
- It gives an accurate measurement of what it is intended to measure
- ‘The students’ minds are doing the things we want them to show us they can (or can’t) do.’



The Question Answering Process

- Generate
- Learn
- Match
- Read
- Search
- Write

Put these processes in the correct order.

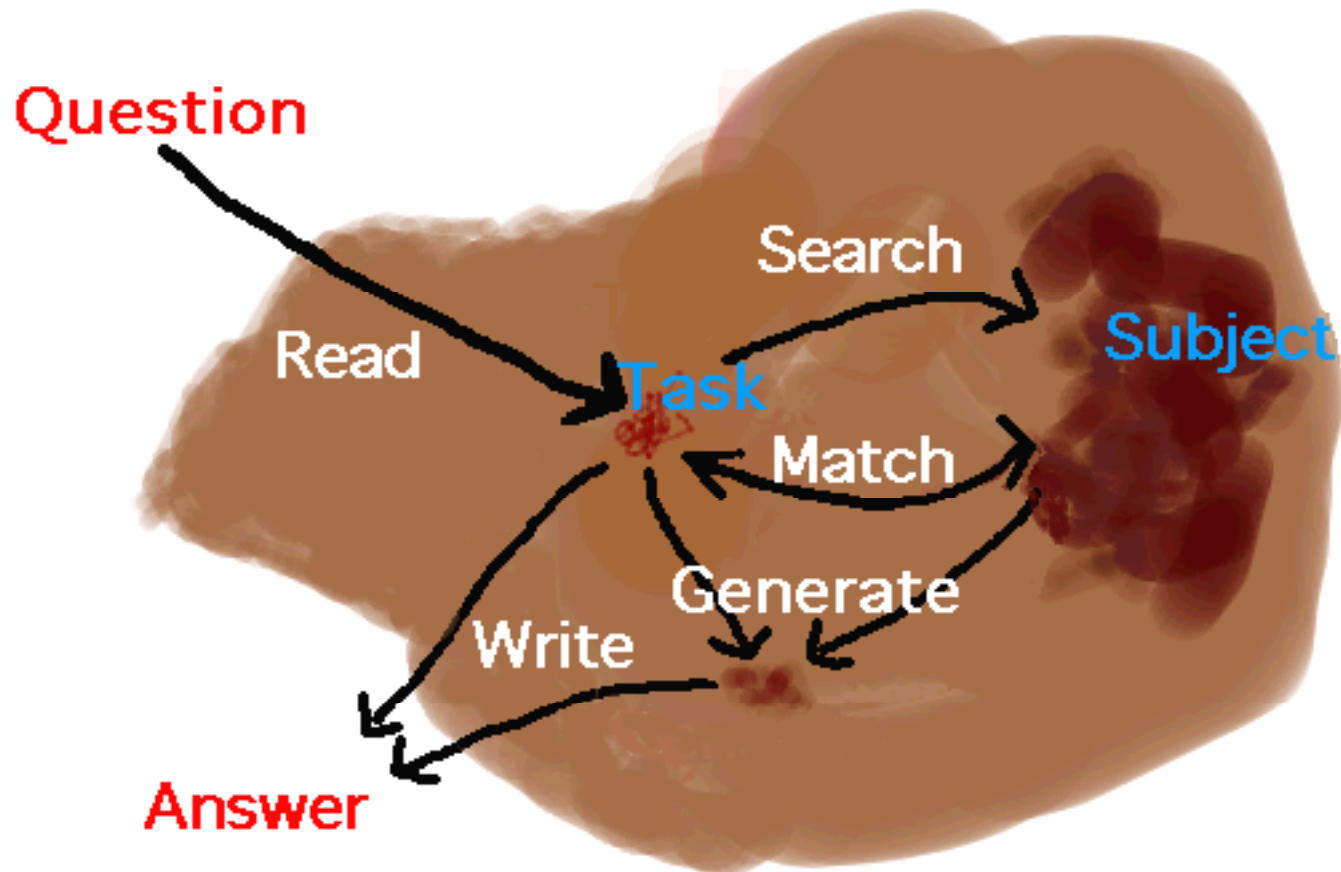


The Question Answering Process

- Phase 0 – **learning** the subject
- Phase 1 – **reading** the question
- Phase 2 – **searching** the memory
- Phase 3 – **matching** memory to the task
- Phase 4 – **generating** an answer
- Phase 5 – **writing** an answer



The Question Answering Process





Outcome Space

- ‘The range of answers or types of answers to a question or task’
- Predicting a question’s outcome space allows us to check for validity and (un)fairness
- Candidates can ‘go wrong’ at each phase of the question answering process
- A good mark scheme accommodates a large proportion of the outcome space



Modifiers of Difficulty (MoDs)

- Factors that can affect the level of difficulty of questions or tasks
- MoDs can be used to manipulate the difficulty
- Some MoDs are valid in certain contexts
- Some MoDs can threaten question validity
- Predicting the effects of MoDs is difficult!



Categories of MoDs

MoDs can be grouped into **four** categories:

- Access to the concepts in the question
- Understanding the meaning of the question
- Responding to the question
- Mark scheme (how the question will be marked)



Access to Question Concepts

- Candidates need to be able to understand all the concepts in the question in order to form a complete **mental model** of it
- Words are ‘cues to build a familiar mental model’
- The question being answered is not the one on the paper, but the one in the learner’s mind



MoDs affecting Access to Question Concepts

- Affective contexts / words
- Bias
- Readability
- Density of presentation
- Novel / complex context
- Technical terms / Difficult vocabulary



Understanding Question Meaning

- Understanding what the question requires the candidate to do
- Question may activate many ideas in a candidate's mind, some relevant, some not
- The candidate may emphasise different words from those intended by examiner
- Misunderstanding leads to the wrong question being answered



MoDs affecting Understanding Question Meaning

- Distracting words
- Everyday meanings
- Emphasis
- Resources
- Ambiguous language
- Familiarity of context



Candidate Response to the Question

- How the candidate sets about responding to the question
- Previous experiences (eg mock exams)
- Subject context



MoDs affecting Candidate Response to the Question

- Command words
- Alternative strategies
- Expectations
- Paper layout
- Response prompts



Mark Scheme

- What is required from candidates in order to gain marks
- Compatibility between questions and mark scheme
- Beyond the candidate's control?!



MoDs affecting Mark Scheme

- Detail required
- Mark allocation
- Alternative interpretation
- Fuzzy answer set



Effects of Stress

- Stress reduces the processing space available for carrying out the exam task
- The main causes of stress are performance anxiety and time pressure
- Stress makes misunderstandings and errors more likely



Task

- Write a simple short answer question or choose one from a sample question paper.
- What is the ‘outcome space’ for this question?
- Draw a diagram to illustrate the outcome space i.e. all the likely correct and incorrect answers.