

Investigating the Use of Short Answer Free Text Questions for Online Interactive Assessment

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1 How are the answers matched?

- OpenMark online interactive assessment is being extended using commercial software, 'Intelligent Assessment Technologies Free Text system', to provide answer matching for free text answers of up to about 20 words.
- The system matches both:
 - keywords (& appropriate synonyms)
 - sentence construction thus distinguishing 'man bites dog' from 'dog bites man.'
- Students' responses are used to improve the answer matching.

2 How flexible is the system?

- It copes well with incorrect spellings even of keywords e.g. photosintesis instead of photosynthesis.
- It recognises complicated negative statements.
 - 'There are no unbalanced forces' is marked correct.
 - 'The forces are unbalanced' is marked incorrect.
- Long, complex sentences can sometimes be difficult to match.
- It allows us to provide instantaneous, targeted feedback.

3 An example of targeted feedback

The Open University S103 Block8 iCMA

Question 1 (of 13)

Info

Questions 1 2 3 4 5 6 7 8 9 10 11 12

Feedback 13

Sulfuric acid is manufactured from the raw materials sulfur, air and water and is a three stage process. In the second stage, sulfur dioxide, SO₂, is mixed with air and the mixture passed over a catalyst of vanadium oxide at a high temperature (about 450°C). The product is sulfur trioxide, SO₃. A student wrote the equation as follows:

$$\text{SO}_2(\text{g}) + \text{O}(\text{g}) \rightleftharpoons \text{SO}_3(\text{g})$$

What is wrong with this equation?

The equation doesn't balance.

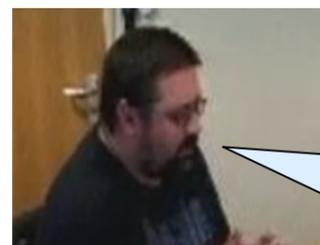
Check

Your answer still does not appear to be correct.

Although the equation is incorrect it does actually balance; there are 3 atoms of oxygen and one atom of sulfur on both sides. Take a careful look at all the formulae. See Block 8 Section 4.2.

Try again

4 How do students respond?

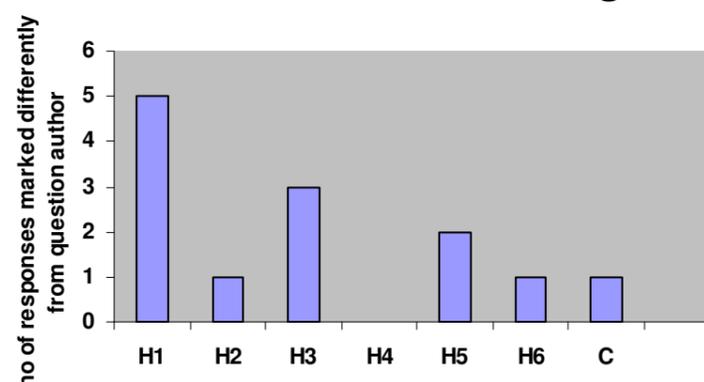


'I'm going to assume that I answer this question in the same way as I would a TMA'

They do respond to feedback and, if necessary, consult the course text



5 How accurate is the marking?



- Computer and human marking of student responses has been compared for 7 questions.
- Early analysis indicates that computer marking (C) is indistinguishable from that of ALs (H1 to H6).
- Analysis of 1 question (189 responses) is shown.

6 Progress/ Future developments

- 64 questions of this type have been written and made available to S103 students in 7 separate iCMAs.
- These iCMAs are purely formative. S104 (first presentation February 2008) will make summative use of questions of this type.
- Number of participants has fallen steadily over the length of each S103 presentation and over the duration of each iCMA. We aim to increase student participation so as to generate more responses to evaluate the performance of all questions.

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