Digital Assessment and feedback: Supporting learners and teachers

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THE OPEN UNIVERSITY (UK)

- Institute of Educational Technology one of the first created departments when OU was founded
- Pedagogy enhanced by Ed Tech
The Open University

Leading global distance learning, delivering high-quality education to anyone, anywhere, anytime

Largest University in Europe

38% of part-time undergraduates taught by OU in UK

173,927 formal students

No formal entry requirements

55% of students are 'disadvantaged'

33% enter with one A-level or less

60% FTSE 100 have sponsored staff on OU courses in 2017/8

66% of new undergraduates are 25+

1,300 employers use OU learning solutions to develop workforce

1 in 8 Open University students has a disability (23,630)

3 in 4 Students are already in work

Students are already in work
Digital assessment and automatic feedback

- Major Disrupter: Covid
- Teachers
- Students
- Researchers
- Other Disrupters

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COVID 19 and how can Learning be supported with automatic feedback systems?

• Teaching moved online
• More online Feedback with no face to face delivery
• Assessment types change
• Physical Invigilation for examinations no longer possible
• Examination issues:
  • Trust
  • Plagiarism
• Moving forward with AI to support students and Learning
A CALL system designed to enable students to:

- Independently practise sentence translation
- Receive immediate (and robust) feedback on all errors
- Attend immediately to the feedback (before fossilisation can occur)
How is the final mark arrived at in the LISC System?

• The two submissions are *unequally* weighted
  • Best to give more weight to the first attempt
    • since this ensures that students give *careful* consideration to the construction of their first answer
    • but can improve their mark by refining the answer
  • The marks ratio can vary (depending on assessment/feedback type)
    • the more information given in the feedback, the lower the weight the second mark should carry
Students

Students’ feelings about Assessment

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Students

Students’ feelings about Assessment

www.storiesabout.com
www.storiesabout.com/creativepdp
c.mckillop@rgu.ac.uk

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• Maintain empathy with the Learner
• Socio e-emotive content
• Advice for Action
What about emotional support in the feedback?

• Difficult at times to receive written feedback

• Not just a cognitive response

• How can Bales help?
### Coding the tutor comments

#### Bales’ Interaction Process

<table>
<thead>
<tr>
<th>Categories</th>
<th>Specific Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive Reactions</strong></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>1. Shows solidarity</td>
</tr>
<tr>
<td></td>
<td>Jokes, gives help, rewards others</td>
</tr>
<tr>
<td>A2</td>
<td>2. Shows tension release</td>
</tr>
<tr>
<td></td>
<td>Laughs, shows satisfaction</td>
</tr>
<tr>
<td>A3</td>
<td>3. Shows agreement</td>
</tr>
<tr>
<td></td>
<td>Understands, concurs, complies, passively accepts</td>
</tr>
<tr>
<td><strong>Attempted Answers</strong></td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>4. Gives suggestion</td>
</tr>
<tr>
<td></td>
<td>Directs, proposes, controls</td>
</tr>
<tr>
<td>B2</td>
<td>5. Gives opinion</td>
</tr>
<tr>
<td></td>
<td>Evaluates, analyses, expresses feelings or wishes</td>
</tr>
<tr>
<td>B3</td>
<td>6. Gives information</td>
</tr>
<tr>
<td></td>
<td>Orients, repeats, clarifies, confirms</td>
</tr>
<tr>
<td><strong>Questions</strong></td>
<td></td>
</tr>
<tr>
<td>C1</td>
<td>7. Asks for information</td>
</tr>
<tr>
<td></td>
<td>Requests orientation, repetition, confirmation, clarification</td>
</tr>
<tr>
<td>C2</td>
<td>8. Asks for opinion</td>
</tr>
<tr>
<td></td>
<td>Requests evaluation, analysis, expression of feeling or wishes</td>
</tr>
<tr>
<td>C3</td>
<td>9. Asks for suggestion</td>
</tr>
<tr>
<td></td>
<td>Requests directions, proposals</td>
</tr>
<tr>
<td><strong>Negative Reactions</strong></td>
<td></td>
</tr>
<tr>
<td>D1</td>
<td>10. Shows disagreement</td>
</tr>
<tr>
<td></td>
<td>Passively rejects, resorts to formality, withholds help</td>
</tr>
<tr>
<td>D2</td>
<td>11. Shows tension</td>
</tr>
<tr>
<td></td>
<td>Asks for help, withdraws</td>
</tr>
<tr>
<td>D3</td>
<td>12. Shows antagonism</td>
</tr>
<tr>
<td></td>
<td>Deflates others, defends or asserts self</td>
</tr>
</tbody>
</table>
Teachers

Identifying trends: H801

Graph to show conflated Bale’s categories against mean number of incidences in H801 scripts

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Welcome to Open Mentor

You're here: OpenMentor >> H804 >> View reports

OpenMentor comment analysis
This page shows details of how each assignment's comments have been analysed.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Course</th>
<th>Assignments marked</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMA 01</td>
<td>H804</td>
<td>25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comment category</th>
<th>Guidelines</th>
<th>Your comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category A: Positive feedback</td>
<td>-</td>
<td>It is very good practice to read through your work... Good idea</td>
</tr>
<tr>
<td>Category B: Teaching points</td>
<td>More than expected</td>
<td>This could have done with a little academic distance eg you... You might need to be a little more explicit: technology...</td>
</tr>
<tr>
<td>Category C: Questions</td>
<td>-</td>
<td>Are these your fellow students on H804? ... Did you get this from a particular report?</td>
</tr>
<tr>
<td>Category D: Negative reactions</td>
<td>More than expected</td>
<td>... not at all scalable You do not need to put the page numbers in here</td>
</tr>
</tbody>
</table>

- Show the full comments
- Show this as a bar chart
- Give me feedback on my use of comments

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Assessment for Sandy Smith: mark assigned 61 (Grade 3)

Bar charts to represent analysis of assignments sent to Open Mentor

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SAFeSEA: Supportive Automated Feedback for Short Essay Answers

An automated tool supporting online writing and assessment of essays providing accurate targeted feedback

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About SAFeSEA

- No tutor support for drafts of first assignment
- Reduce dropout rate with automatic feedback?
- Effect of summaristion
- What are the beneficial factors?
- Correlate measures of learner activity and essay improvement
OpenEssayist: What it tells you

- The system’s focus is to present summaries of students’ own work in different ways, to encourage them to reflect constructively on what they have written.

- In other words Open Essayist tells them from its analysis what are the most important or key points in their essay. They can then think about whether that was what they intended to emphasise in their essay. If not then they can make the appropriate changes.

- A very important aspect of the OpenEssayist system is that it will not tell students what to write, or how to rewrite sections of their essay, or even what is correct or incorrect in their essay.
Researchers

OpenEssayist: How it gives Feedback

- Three aspects of the students’ essays are analysed by the system:
  - the **structure** of the essay (which paragraphs constitute the introduction, the conclusion, the discussion sections, etc.),
  - the **key words and key phrases** of their essay (which are the most important words and phrases, the ones that are most representative of the essay's overall meaning)
  - the **key sentences** of their essay (which are whole sentences that are most representative of the essay's overall meaning).
Sample key phrases dispersion plot
Researchers

Grades and use of OpenEssayist with H817

• Used by MAODE students

• Positive correlations

1. Grades for Essay 1 and number of drafts ($r=+0.41$)

2. Number of site visits and number of drafts ($r=+0.65$)

3. Number of visits and grade for Essay 2 was significant one tailed test ($r=+0.5$)

4. Mean grade for overall module for students in cohort who used OpenEssayist (64.2) and students in previous cohort (53.7) ($p=0.4$)
Can essay structure assist with grading and feedback?

Lessons learned from Open Essayist

• Visualising structure

• Matching structure to mark
Short text for illustration of Rainbow Diagrams

Text (Extract from online FAQ about foxes)
Will the foxes in my garden attack my dog or cat?
This is extremely unlikely. 2. Foxes avoid dogs, even small dogs, because many foxes are killed by dogs.
So it is much more likely that your dog will attack the fox, not the other way round. Attacks on cats are equally rare: cats and foxes are roughly the same size, and cats are very capable of defending themselves against foxes. So it is hardly surprising that foxes generally give cats a wide berth and flee when threatened by a cat. Occasionally small kittens are killed, but this is rare. Keeping your cat indoors at night greatly reduces the chances of an encounter with a fox. 8. There are also a variety of other benefits: cats kept in at night are healthier and live longer, and kill less of the local wildlife.
Researchers

Sentence graph of short text

Last sentence (node 8 - red)
"There are also a variety of other benefits: cats kept in at night are healthier and live longer, and kill less of the local wildlife"

Second sentence (node 2 - violet)
"Foxes avoid dogs, even small dogs, because many foxes are killed by dogs."

Link
Node 8 and node 2 are linked because they have a word in common: 'kill'
Researchers

Pretend essay: 10 identical paragraphs
Pretend essay: 50 identical sentences
Stanford University Boothe Prize essay
OU Essay awarded high grade

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OU essay awarded low grade

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Rainbow diagrams related to mark awarded

• Multivariate analysis of variance on marks awarded to 45 students
• Submitted two essays
• Rainbow diagrams produced from these essays and rated as high, medium or low attainment
• Covariate showed a significant relationship with the marks
• \( F(1, 43) = 5.92, p = .01 \) using a directional test
• Essays rated as high would be expected to receive 8.56 percentage points more than essays rated as medium
• 17.2 percentage points higher than essays rated from rainbow diagrams as low
How about anywhere anytime testing? TeSLA: Adaptive Trust based e-Assessment

- AIM: Secure & reliable online assessment
- TECHNOLOGIES: Voice/face recognition, keystroke pattern detection, anti-plagiarism and forensic analysis
- 18 European partners, OUUK responsible for evaluation

http://tesla-project.eu/

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## TeSLA Participants

<table>
<thead>
<tr>
<th>STUDENTS</th>
<th>AU</th>
<th>JYU</th>
<th>OUNL</th>
<th>OUUK</th>
<th>SU</th>
<th>TUS</th>
<th>UOC</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total of students to use TeSLA (unique participants)</td>
<td>2,325</td>
<td>1,844</td>
<td>417</td>
<td>1,617</td>
<td>1,457</td>
<td>1,574</td>
<td>1,868</td>
<td>11,102</td>
</tr>
<tr>
<td>Students who completed the pre-questionnaire (% of total)</td>
<td>240</td>
<td>167</td>
<td>84</td>
<td>853</td>
<td>232</td>
<td>783</td>
<td>1169</td>
<td>3528</td>
</tr>
<tr>
<td></td>
<td>10%</td>
<td>9%</td>
<td>20%</td>
<td>53%</td>
<td>16%</td>
<td>50%</td>
<td>63%</td>
<td>32%</td>
</tr>
<tr>
<td>Students who completed the post-questionnaire (% of total)</td>
<td>171</td>
<td>115</td>
<td>57</td>
<td>574</td>
<td>226</td>
<td>452</td>
<td>627</td>
<td>2222</td>
</tr>
<tr>
<td></td>
<td>7%</td>
<td>6%</td>
<td>14%</td>
<td>35%</td>
<td>16%</td>
<td>29%</td>
<td>34%</td>
<td>20%</td>
</tr>
</tbody>
</table>
**Participants:** subject studied

![Field of study diagram](image)

- **Arts and Humanities:**
  - 2nd pilot: 10%
  - 3rd pilot - stage A: 6%
  - 3rd pilot - stage B: 6%

- **Social and Legal Sciences:**
  - 2nd pilot: 6%
  - 3rd pilot - stage A: 24%
  - 3rd pilot - stage B: 27%

- **Sciences:**
  - 2nd pilot: 6%
  - 3rd pilot - stage A: 0%
  - 3rd pilot - stage B: 8%

- **Health Sciences:**
  - 2nd pilot: 2%
  - 3rd pilot - stage A: 5%
  - 3rd pilot - stage B: 10%

- **Engineering and Architecture:**
  - 2nd pilot: 15%
  - 3rd pilot - stage A: 64%
  - 3rd pilot - stage B: 9%

*Figure 1: Field of study*
### Participants: language of study

#### Language of the courses – pilot 3

<table>
<thead>
<tr>
<th>Language</th>
<th>No. of students</th>
<th>No. of courses with students taking part in the pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
<td>1%</td>
<td>0,1%</td>
</tr>
<tr>
<td>Bulgarian</td>
<td>24%</td>
<td>33%</td>
</tr>
<tr>
<td>Catalan &amp; Spanish</td>
<td>25%</td>
<td>10%</td>
</tr>
<tr>
<td>Dutch</td>
<td>11%</td>
<td>10%</td>
</tr>
<tr>
<td>English</td>
<td>18%</td>
<td>12%</td>
</tr>
<tr>
<td>Finnish</td>
<td>8%</td>
<td>12%</td>
</tr>
<tr>
<td>Turkish</td>
<td>20%</td>
<td>7%</td>
</tr>
</tbody>
</table>
ACTIVITIES WHERE TeSLA IS INTEGRATED

- Assignment Submission
  - Course Work
  - Presentations
  - Video/Audio Files
  - Academic Essays

- Forum
  - Discussions
  - Group Work

- Attendance & Activity
  - Reading and Reviewing Resources
  - Opening Files
  - Access to Video Lectures

- Quiz
  - Quizzes with Open/Close Questions
  - Online Quizzes (conducted in University)
  - Online Quizzes (conducted at Home)

- Online Texts Submission
  - Online Essay Writing
  - Short Answer
  - Plan
  - Course Work
Outcomes: Students

positive experience for more than 50% of the students

>70% of participating students considered the key advantages of e-assessment with e-authentication to be: “to ensure that my examination results are trusted” and “to prove that my essay is my own original work”.

The most popular TeSLA instruments for students were *Forensic Analysis* and *Anti-Plagiarism*: these instruments were less intrusive. And less time was required for their use.

Many felt e-authentication would increase trust in e-assessment for students, institutions and employees. The most popular reasons given included: e-authentication would make it more difficult for students to cheat.
AI for Education

- Chatbox recommender systems
- Assessment feedback from your own personal robot
- Language rehearsal with your own robot?
Grand Challenge using assessment to represent an analysis of learning that can be readily understood by students and help them progress
References


References (2)


Denise Whitelock, 2022
References (3)


