

# Giving and Receiving Feedback: How does it work for digital Assessment?

Professor Denise Whitelock

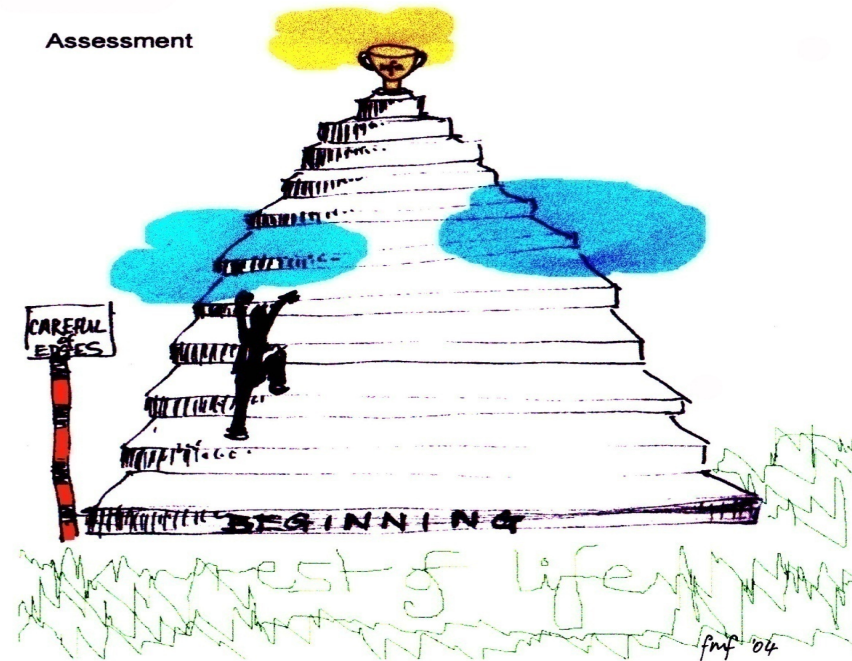
The Open University

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# Who is driving digital assessment?

- Students
- Teachers
- Researchers
- Awarding Bodies
- Software developers
- Disrupters





[www.storiesabout.com](http://www.storiesabout.com)  
[www.storiesabout.com/creativepdp](http://www.storiesabout.com/creativepdp)  
[c.mckillop@rgu.ac.uk](mailto:c.mckillop@rgu.ac.uk)



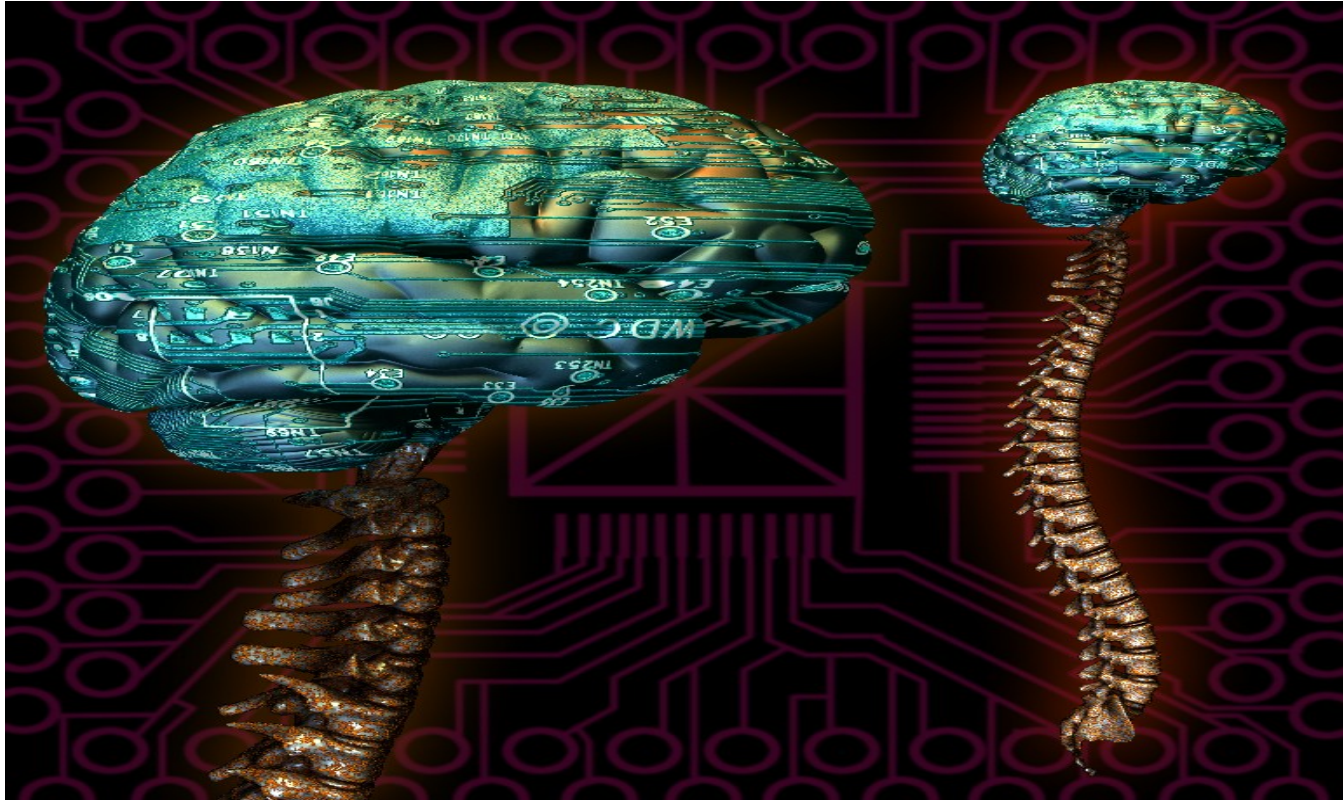


## Awarding Bodies

### The e-Assessment and automatic feedback Challenge

- Constructivist Learning – Push
- Institutional reliability and accountability – Pull



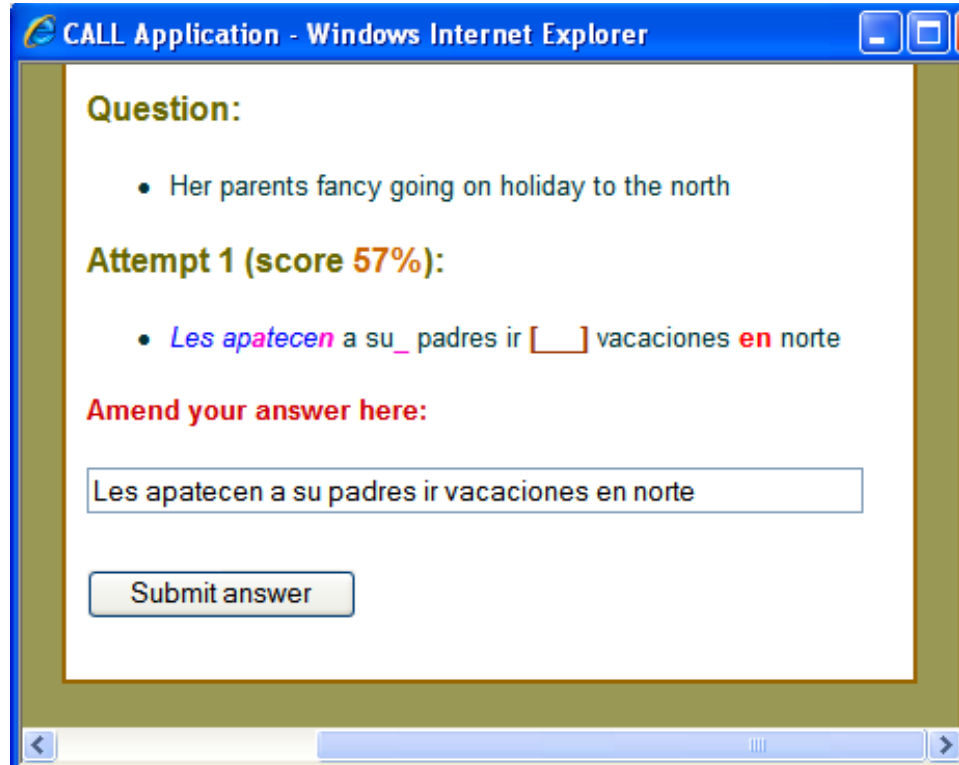


## Teachers

The LISC solution: developed by Ali Fowler

### 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)



CALL Application - Windows Internet Explorer

**Question:**

- Her parents fancy going on holiday to the north

**Attempt 1 (score 57%):**

- Les *apatecen* a su \_padres ir [ ] vacaciones *en* norte

**Amend your answer here:**

Les apatecen a su padres ir vacaciones en norte

Submit answer

## Teachers

### 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

### Supporting Students Anxiety

- Maintain empathy with the Learner
- Socio e-emotive content
- Advice for Action



## Researchers

### Evidence from literature re Praise feedback for Open Comment

- Praise for ability per se can hinder learning (Mueller & Dweck, 1998)
- Praise = being clever
- Negative feedback now without ability
- Disempowering and demoralising



## Researchers

### **Mueller & Dweck (1998)**

- Raven's Matrices (IQ)
- First test pupils praise either for effort or ability
- Second test most difficult
- Third test medium difficulty. Score up 1 points for pupils praised for effort. Down 1 point ability

# How does feedback effect mindsets?

1. Your intelligence is something very basic about you that you can't change very much
2. You can learn new things but you can't really change how intelligent you are
3. No matter how much intelligence you have you can always change it quite a bit
4. You can always substantially change how intelligent you are



# Mindsets (Dweck, 2006)

## Fixed mindset

- Super sensitive about being wrong
- Always trying to prove themselves

## Growth mindset

- Stretch themselves
- Confront obstacles as challenges
- Lack of tension when learning as they know they are novices and can improve

AA000: Combined Quiz

http://localhost/~stuart/moodle/mod/quiz/review.php?attempt=15

Canada Personal Meet-O-Matic Shopping Open Comment ARM

AA000: Combined Quiz

## Open Comment Arts

You are logged in as [Stuart Watt](#) (Logout)

Moodle ► AA000 ► Quizzes ► Combined Quiz ► Review


Update this Quiz

Info Results Preview Edit

Start again

Started on:	Thursday, 3 July 2008, 01:16 pm
Completed on:	Thursday, 3 July 2008, 01:17 pm
Time taken:	45 secs

[Click here to go back to the course](#)


1 

Read the first paragraph in which Joll analyses why the outbreak of the First World War has been studied in such detail. What reasons does he give?

Answer: No idea

**Feedback:**

Maybe you are a bit confused by the question. It may be helpful to remember you are not being asked about the causes directly, but why the causes have been so extensively studied

 [Moodle Docs for this page](#)

You are logged in as [Stuart Watt](#) (Logout)

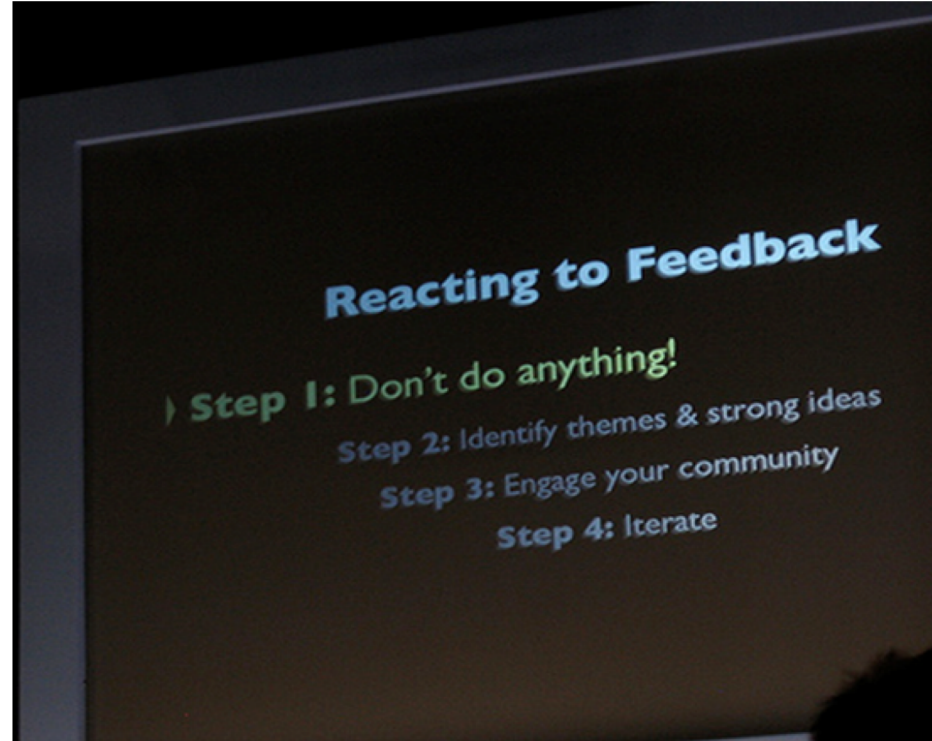
Stages of analysis by computer of students' free text entry for Open Comment: advice with respect to content (socio-emotional support stylised example)

- **STAGE 1a: DETECT ERRORS** E.g. Incorrect dates, facts. (Incorrect inferences and causality is dealt with below)
- Instead of concentrating on X, think about Y in order to answer this question Recognise effort (Dweck) and encourage to have another go
- You have done well to start answering this question but perhaps you misunderstood it. Instead of thinking about X which did not..... Consider Y

## Teachers

### Computer analysis continued

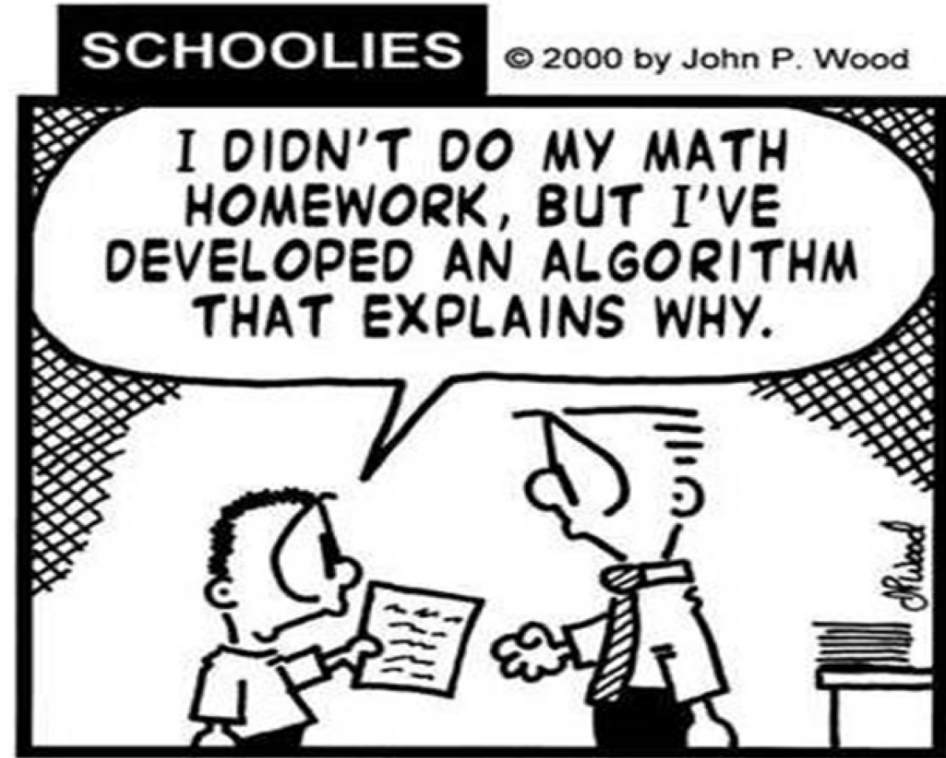
- **STAGE 2a: REVEAL FIRST OMISSION**
- Consider the role of Z in your answer Praise what is correct and point out what is missing Good but now consider the role X plays in your answer
- **STAGE 2b: REVEAL SECOND OMISSION**
- Consider the role of P in your answer Praise what is correct and point out what is missing Yes but also consider P. Would it have produced the same result if P is neglected?



## Teachers

### Final stages of analysis

- **STAGE 3:REQUEST CLARIFICATION OF KEY POINT 1**
- **STAGE 4:REQUEST FURTHER ANALYSIS OF KEY POINT 1**(Stages 3 and 4 repeated with all the key points)
- **STAGE 5:REQUEST THE INFERENCE FROM THE ANALYSIS OF KEY POINT 1 IF IT IS MISSING**
- **STAGE 6:REQUEST THE INFERENCE FROM THE ANALYSIS OF KEY POINT 1 IF IT IS NOT COMPLETE**
- **STAGE 7:CHECK THE CAUSALITY**
- **STAGE 8:REQUEST ALL THE CAUSAL FACTORS ARE WEIGHTED**



## What about emotional support in the feedback?

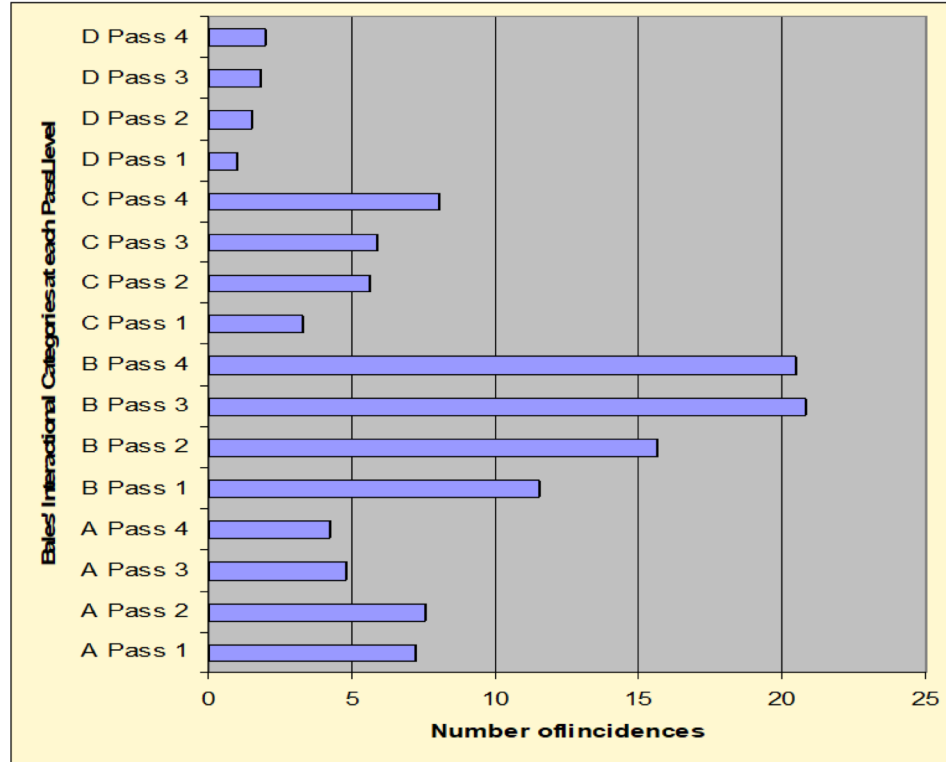
- Difficult at times to receive written feedback
- Not just a cognitive response
- How can Bales help?

## Teachers

### Coding the tutor comments

#### Bales' Interaction Process

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



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





# Welcome to Open Mentor

You're signed in as **OM User** [Sign out](#)

## Options

- [Open Mentor Home](#)
- [Submit assignment](#)
- [View reports](#)
- [Administration](#)
- [Background](#)
- [Site index](#)
- [Sign out](#)

You're here: [OpenMentor](#) >> [H804](#) >> View reports

## OpenMentor comment analysis

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

Assignment	Course	Assignments marked
TMA 01	<a href="#">H804</a>	<a href="#">25</a>

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

- [Show the full comments](#)
- [Show this as a bar chart](#)
- [Give me feedback on my use of comments](#)



1

- ◆ *Open Mentor Home*
- ◆ [Submit assignment](#)
- ◆ [View reports](#)
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### OpenMentor comment analysis

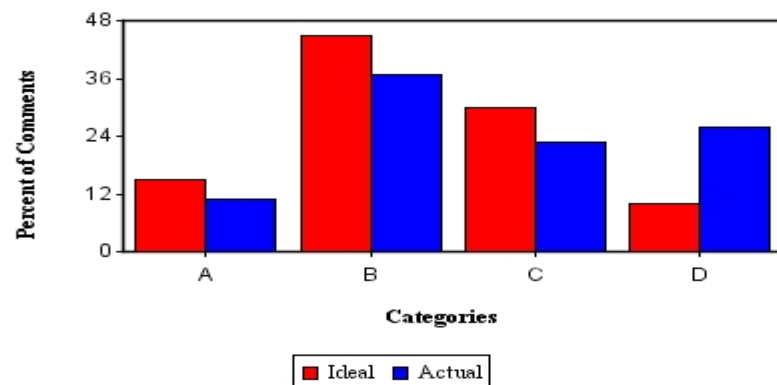
This page shows details of how each assignment's comments have been analysed.

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

Assignment	Course	Assignments marked
TMA 01	H804	25

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

Bar charts to represent analysis of assignments sent to Open Mentor



### Category keys table

<a href="#">Category A</a>	Positive Reactions
<a href="#">Category B</a>	Teaching Points
<a href="#">Category C</a>	Questions
<a href="#">Category D</a>	Negative Reactions

- Show this as a summary table

# SAFeSEA: Supportive Automated Feedback for Short Essay Answers

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



**EPSRC**

Engineering and Physical Sciences  
Research Council



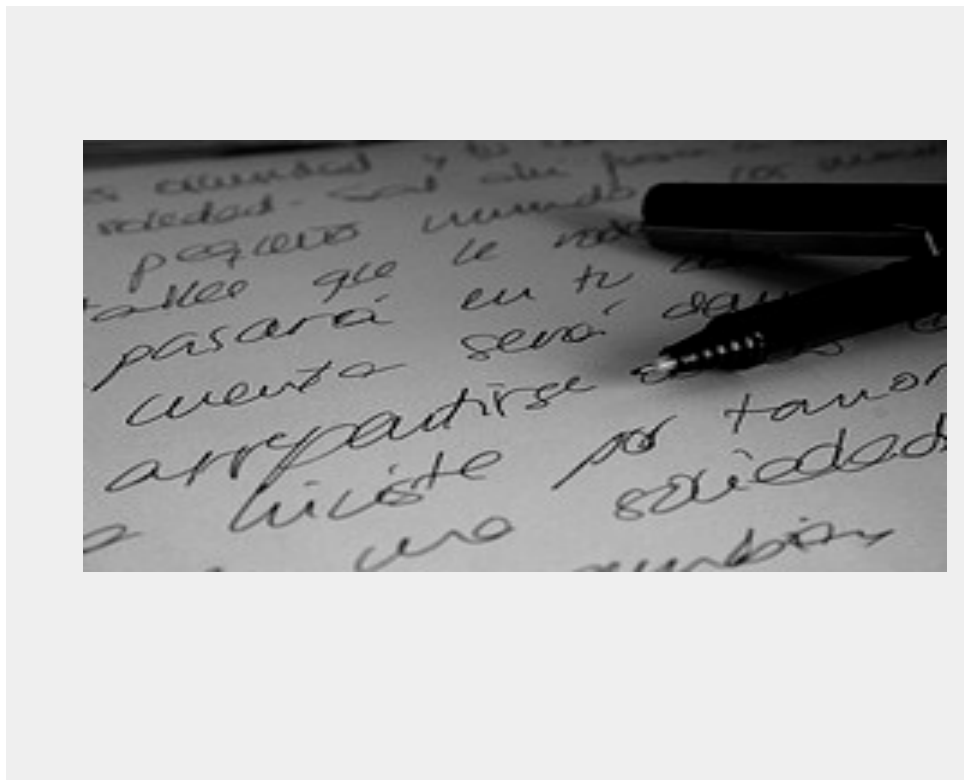
**SAFeSEA**

**Professor Denise Whitelock**  
**Professor John Richardson**

**Professor Stephen Pulman**

# About SAFeSEA

- No tutor support for drafts of first assignment
- Reduce dropout rate with automatic feedback?
- Effect of summarisation
- What are the beneficial factors?
- Correlate measures of learner activity and essay improvement
- <http://www.open.ac.uk/iet/main/research-innovation/research-projects/supportive-automated-feedback-short-essay-answers>



# 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.

# 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).

[Home](#) > [Assignments](#) > [TMA01](#) > Version 19

## Your Draft : Overview (text only)

Version 19

Essay

Analysis

Graphics

Hints

Help

### Your essay

Show:

Text

Key Words

Key Sentences

All

T

**Did I really mean that? Applying automatic summarisation techniques to formative feedback**

H

**Authors: Debora Field, Stephen Pulman, Nicolas Van Labeke, Denise Whitelock, John TE Richardson**

H

**Abstract**

P

(2)This paper reports on an application that delivers automated formative feedback designed to help university students improve their assignments. (3)The aim of the system is to improve the confidence and skills of the user by promoting self-directed learning through metacognition. (4)The system focuses on the content of an essay by using automatic summarisation techniques, automatic structure recognition, diagrams, animations, and interactive exercises that promote reflection. (15)The system is currently undergoing initial exploratory rounds of testing by ex-student volunteers and will be the subject of two full-scale empirical evaluations starting in September 2013. (1)The main claims of this paper are the application and adaptation of graph-based key word and key sentence ranking methods for a novel purpose, and ensuing observations concerning the suitability of two different centrality algorithms for the purposes of key word extraction.

H

**1 Introduction**

I

A fundamental problem in distance education is student attrition, particularly during the early months, largely due to low morale. Graduation rates at distance-learning institutions are often less than those evident at the level of individual modules or course units, where completion rates may be as low as 30% for some groups of students, such as those from ethnic minorities (Richardson, 2012). Some students who have dropped out of Open University courses have reported that the reason they left was a conviction of their own inadequacy when completing assignments. These reports are backed up by the drop-out rate that occurs just before the first course, is typically as high as 30%.

I

It appears, then, that there is a need for strategies that increase students' confidence and skills. The ideal strategy would be to provide frequent consultations with human tutors, but resource implications dictate that this is not a viable

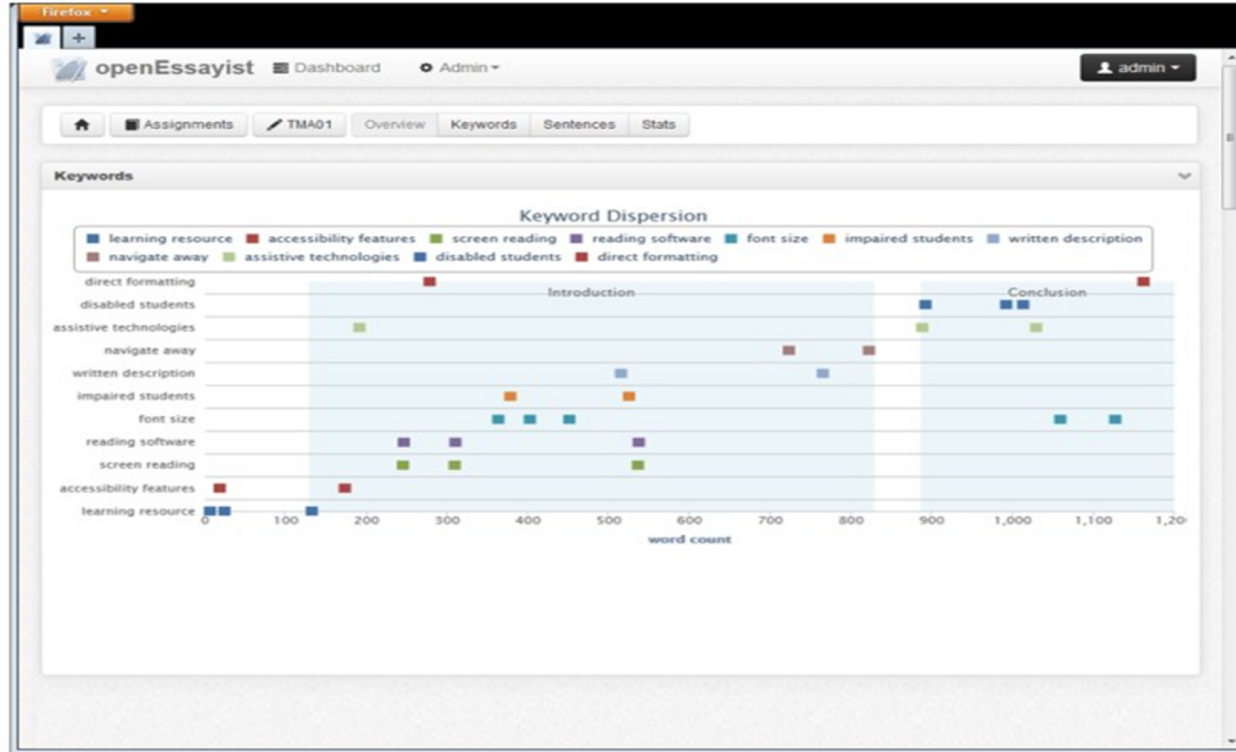
 Hint

Do you think openEssayist got the parts of your assignment right?

 Hint

Did it correctly identify an Introduction, a Conclusion, the main text, etc.?

# Sample key phrases dispersion plot





## 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) ( $p=0.4$ )

# Short text for illustration of Rainbow Diagrams

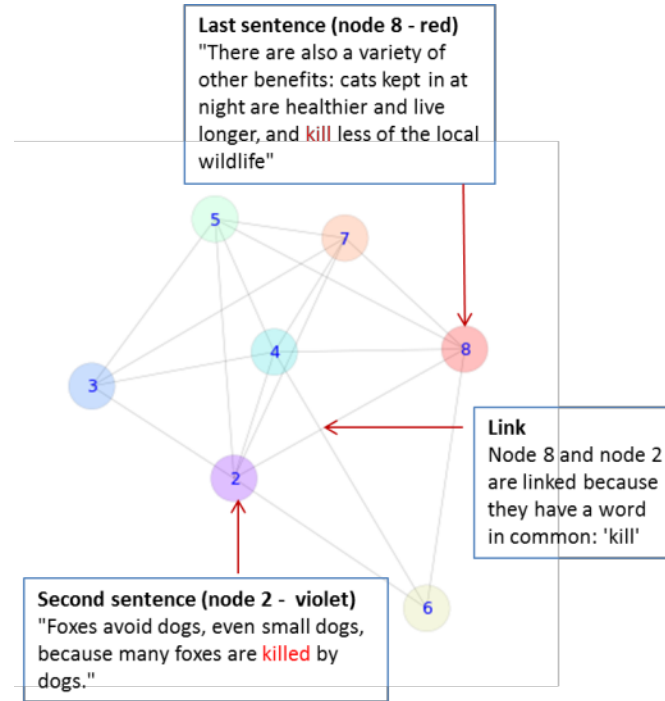
## Text (Extract from online FAQ about foxes)

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.*

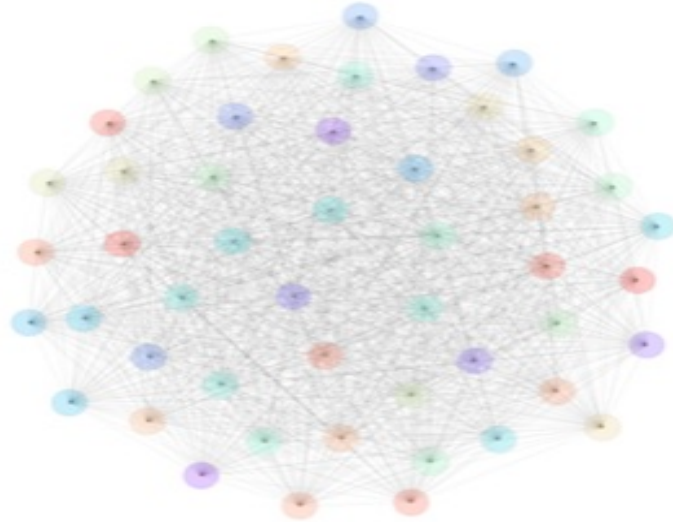
## Sentence graph of short text



# Pretend essay: 10 identical paragraphs



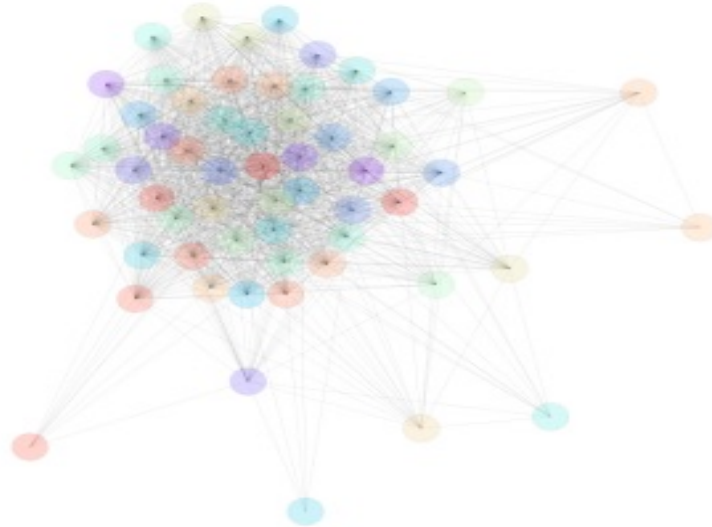
# Pretend essay: 50 identical sentences



# Stanford University Boothe Prize essay



# OU Essay awarded high grade



# OU essay awarded low grade





## 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

# NLP developments



- Paraphrasing with Amplify (Del Giudice)
- SWORD (Computer Supported Peer Review) Litman et al
- BEETLE II Tutorial Dialogue System (Dzikovska et al)

# Is NLP the bridge between Digital Assessment and Learning Analytics?

Automatic  
marking

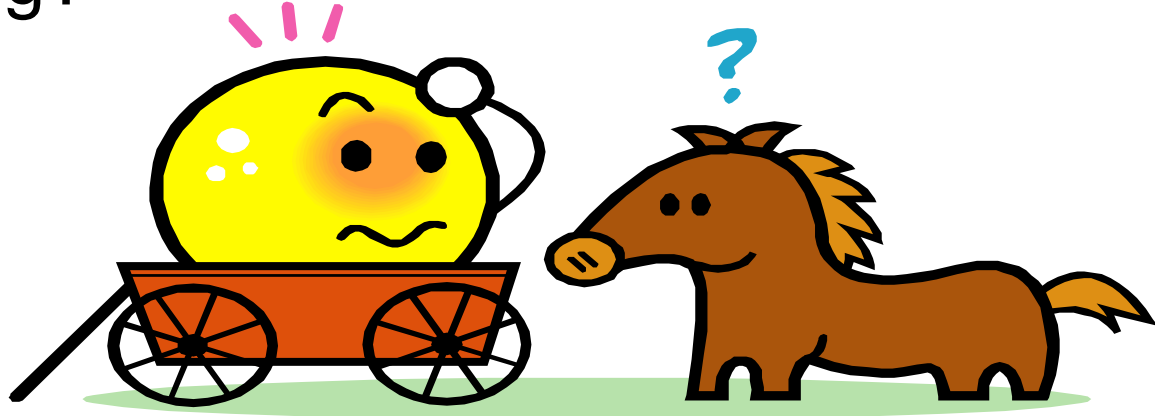
Recognising text

Refining text



# How about feedback first?

- Hints before writing?
- R.C.T.
- 2 essays
- $F(1,41) = 3.23$   $p = 0.04$  for hints



# Creating teaching and learning dialogues: towards guided learning supported by technology

- Learning to judge
- Providing reassurance
- Providing a variety of signposted routes to achieve learning goals
- Provide socio-emotive support



# “Advice for Action”, Whitelock (2011)

- Helping students find out what they do not know and how to remedy the situation can avoid the trauma of assessment
- Digital Assessment, LA, NLP does the community matter?
- More importantly are we on the way to supporting student learning?



### 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/>



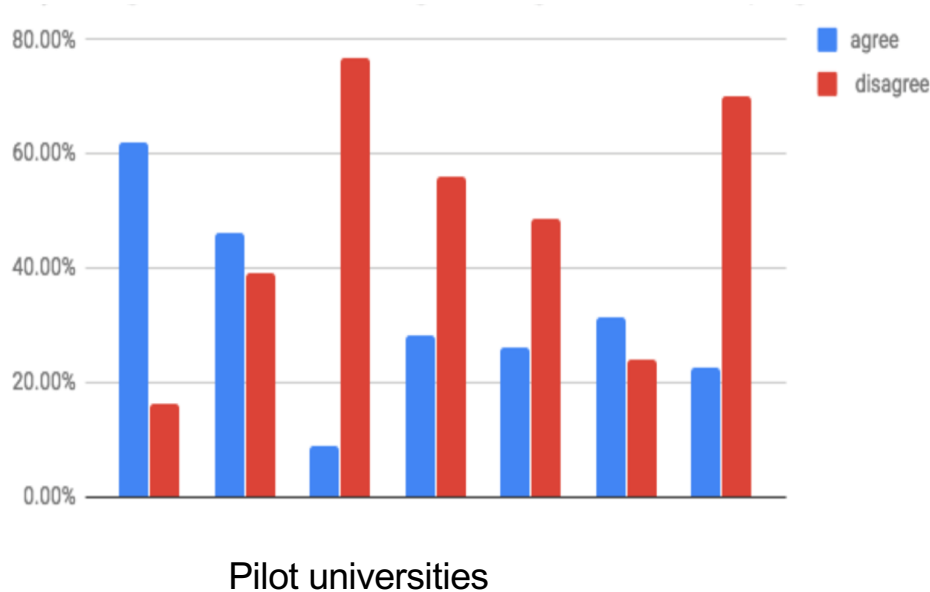
## TeSLA Participants

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



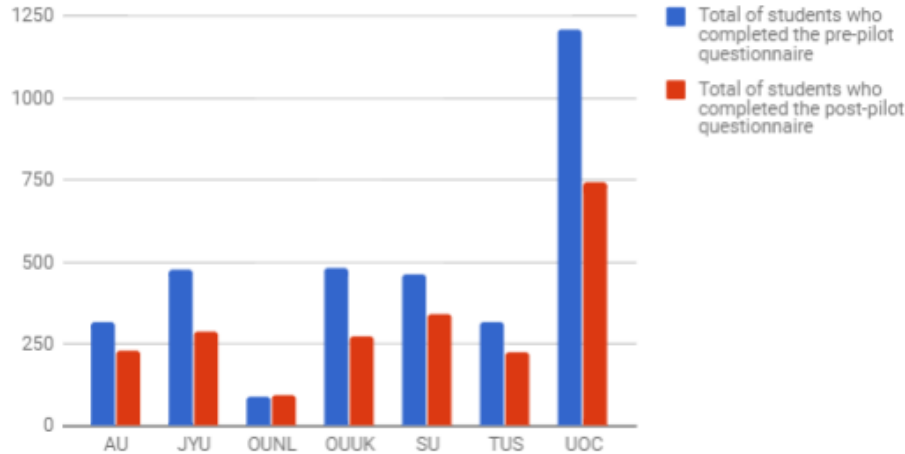
## Students' opinions about plagiarism

“Copying and pasting a paragraph from an academic paper into my assignment and crediting the original source is plagiarism (a type of cheating)”.

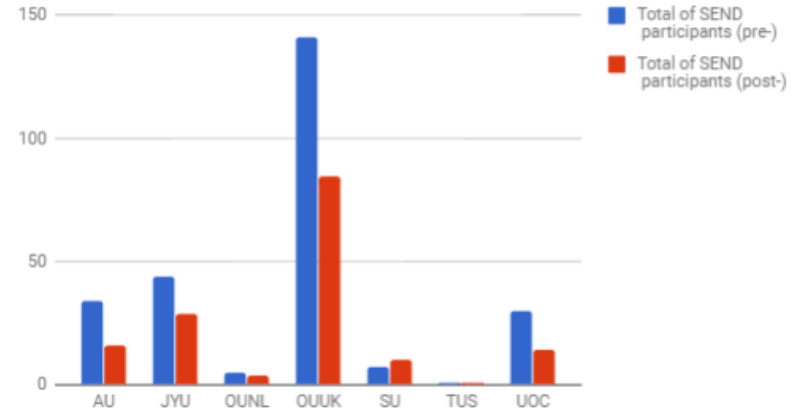


# TeSLA PARTICIPANTS IN RECENT PILOT STUDY

Total of students who completed the pre-pilot questionnaire and Total of students who completed the post-pilot questionn...



Total of SEND participants (pre-) and Total of SEND



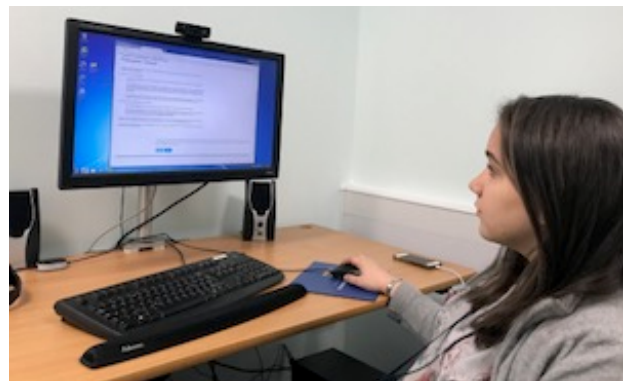
# Students views on Trust and possible explanations (3a)

- There are three universities OUNL (75%) OUUK( 79%) and UOC (82%) whose students trust an on online system, more than those from other institutions.
- There are also four universities, AU (24%), JYU (26%), SU (25%) and TUS (21%), where more students do not trust a fully online assessment.
- Students from AU (76%) and TUS (78%) are less used to online assessment.
- Students from TUS (22%) , SU (15.5%) and AU (7.8%) are less aware of academic malpractices than from OUUK (1.9%) , UOC (4.0%) and OUNL (1.1%).
- Most of the students from the test universities identified some advantages to online assessment with authentication, such as; improves rigour and proves submission of original own work.
- Only an average of 20% of students are willing to share personal data.

*"I find the controversy of e-identity practice controversial. Academic studies on e-identity, identity number, etc. warn us that they can turn us into a surveillance society."* [Student from AU](#)

*"It is still a very green project, so trust will not be gained overnight".* [Student from UOC](#)

Denise Whitelock, Heerlen, May 2019



# Drivers for disruption

- Commercial companies
- Private online learning institutions
- Government policies for shorter, cheaper courses



## Disrupters

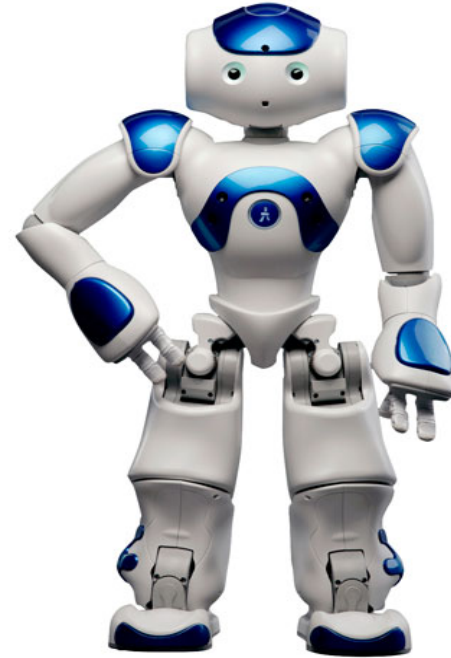
### Artificial Intelligence for business

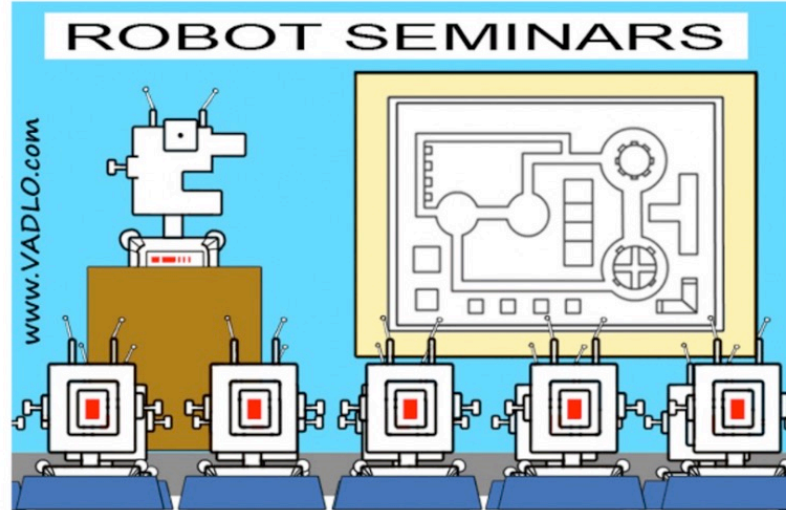
- Microsoft Azure
- Dixons' Cami – opening a dialogue for car sales
- Carnival Maritime tracks and predicts water use to keep a cruise ship in working order



# AI for Education

- Chatbox recommender systems
- Assessment feedback from your own personal robot





As we have just five minutes left,  
I will take just 3 million questions

Source: OU CREET Academy1

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<http://caaconference.co.uk/wp-content/uploads/WhitelockB-CAA2011.pdf>
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