Online vs paper-based formative assessment in the writing classroom

Lisa Emerson
School of English & Media Studies
Massey University
l.emerson@massey.ac.nz

Bruce MacKay
Institute of Natural Resources
Massey University
Central question

• The central question of this presentation:
  
  Is online learning or paper based learning more effective in helping students to achieve mastery?

• Formative assessment essential to all writing classrooms

• No-one seems to be assessing whether online learning tools have a better impact on learning than more traditional tools
This was not a question we expected to ask....

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Large class for science students who had to pass mastery tests in punctuation.</td>
<td></td>
</tr>
<tr>
<td>• These students included off-campus students.</td>
<td></td>
</tr>
<tr>
<td>• Internal students dependant on tutors for support: lectures, workshops, one-on-one support</td>
<td></td>
</tr>
<tr>
<td>• Off-campus students dependant on paper-based material</td>
<td></td>
</tr>
</tbody>
</table>
The dilemma

- How to provide more support for students which was not dependant on the time of the teachers?
- Written material too static
- Online support provided the obvious answer.
- Designed an online tool, including a formative assessment test, so students could develop mastery independently.
According to Katz and Yablon (2002), the Internet is uniquely equipped to provide interactivity, and “interactivity of all types has been shown to meet general student needs more comprehensively than other distance learning modes” (p.70).
Models of online learning

- **Model one**: limited interactivity such as clicking links, feedback forms and search engines which is present on most web sites

- **Model two**: increased interactivity between student-teacher and student-student, seeing the web as a new form interpersonal communication within a learning context
Chou’s (2003) model

- **Choice**  Students need a range of material provided in different ways and through different media so that they can choose a learning pathway that suits their needs.

- **Non-sequential access of choice**  Users need to be able to choose material in a variety of ways – there should not be a single linear pathway.

- **Responsiveness**  The system needs to respond to the learner’s learning choices immediately.

- **Monitoring information use**  The system should collect information on the users and how they access and use the information, so that the pedagogy can be improved.
Chou’s model

- **Personal-choice helper** Information should be provided which assists the learner in making choices about which information to access.

- **Adaptability** The information made available should be adaptable to the individual learner’s needs.

- **Playfulness** Learners are often motivated to learn if they perceive the material presented and the pathway through the learning material as fun and enjoyable.

- **Ease of adding information** The system should be easy to develop, so that teachers can change material that proves not pedagogically sound.
Interactive grammar!

• An online lesson based on Chou’s model
• Focused on punctuation (example: apostrophes)
• Pedagogical approach: lesson-trial-test
• Students are given choice
• Element of playfulness
• At the end students can test their understanding using a mastery test
Some people feel that apostrophes are an eternal mystery - but you need feel this no longer!

Join us as we help you unravel the secrets of apostrophe usage. At the end you will be able to:

- use apostrophes for contractions
- use apostrophes for standard possessive form
- understand the exceptions to standard possessive form

Each of these aspects of apostrophe use represents a level of understanding and we will take you through each level separately.

- Continue »

Christine's heartbreak was momentarily forgotten as she struggled to remember a long forgotten rule of punctuation.
Apostrophes are used to show that a letter (or letters) have been missed out in a word. For example:

- Don't (do not) walk on the grass!
- Can't (cannot) you understand simple grammar?
- Let's (let us) take the road to the left.
- You're (you are) too good to be true.
- Here's (here is) your red shirt.

Another important example:

- It's (it is) not too hot outside.
- It's (it has) been a long, hard day.

Note the last example. Its needs an apostrophe when it means "it is" or "it has." It does NOT need an apostrophe when it means "belonging to it" (eg., the dog jumped into its basket. Here an apostrophe is not needed because its here does not mean it is or it has, it means "belonging to it").

Try it out!
Do you need apostrophes anywhere in the following sentences?

1. Wheres Laura?
2. I couldn't see what she was getting at
3. The alien clicked its antennae
4. Hows that?
5. I thought it was your turn
6. Its your turn to go outside in the rain

How many did you find? Click here to check.

Are you ready to test yourself again?
Do you need apostrophes anywhere in the following sentences?

1. Where's Laura?
2. I couldn't see what she was getting at
3. The alien clicked its antennae
4. How's that?
5. I thought it was your turn
6. It's your turn to go outside in the rain

How many did you find? Click here to check.

Apostrophes are needed in:

- sentence #1 (Where's)
- sentence #2 (couldn't)
- sentence #4 (How's)
- sentence #6 (It's)

If you found all these places for apostrophes then you are ready to go onto the test. If you got any of those questions wrong, read through the previous page again.

Are you ready to test yourself again?
Read the questions below. For each question, indicate which of the four options is correct. To move onto the next level, you must correctly answer all the questions.

**Question 1.**  
- Thanks for putting the horse through its paces.
- Thanks for putting the horse through it's paces.
- Thank's for putting the horse through it's paces.
- Thank's for putting the horse through its paces.

**Question 2.**  
- It's got to be said: he's always difficult to work with
- It's got to be said: he's always difficult to work with.
- Its got to be said: he's always difficult to work with.
- Its got to be said: he's always difficult to work with.

**Question 3.**  
- Your attitude is always positive; that's why we've always got on so well.
- You're attitude is always positive; that's why we've always got on so well.
- You're attitude is always positive; that's why we've always got on so well.
- Your attitude is always positive: that's why we've always got on so well.
Read the questions below. For each question, indicate which of the four options is correct. To move onto the next level, you must correctly answer all the questions.

You correctly answered 2/5 questions, but this was not sufficient to pass the quiz.

Please continue »

Question 1

☐ Thanks for putting the horse through its paces.
☐ Thanks for putting the horse through it's paces.
☒ ☒ Thank's for putting the horse through it's paces.
Sorry, incorrect. Look closely at 'thank's' and 'it's'. Are they really contractions? What do you think they are short for?
☐ Thank's for putting the horse through its paces.

Question 2

☐ It's got to be said: hes always difficult to work with
☐ It's got to be said: he's always difficult to work with.
☐ Its got to be said: hes always difficult to work with
☒ ☒ Its got to be said: he's always difficult to work with
Sorry, incorrect. You got 'he's' right - it's a contraction. But what about 'it's'?

Question 3

☒ Your attitude is always positive: that's why we've always got on so
But…

- Exciting opportunities
- Some students couldn’t access the web from home.
- Developed a paper-based version of the lesson
- A research opportunity that couldn’t be missed: were students more likely to achieve mastery using the online tool or the paper-based tool?
Methodology

• 59 students (85% female; 63% aged 18-26)
• 39 on-campus and 20 off-campus
• Students randomly allocated to either an online lesson or its paper-based version
• Pre-test focusing on prior knowledge and attitudes
• Completed lesson including mastery test: mastery test score recorded.
• Two post-tests: one provided quantitative and qualitative assessment of the lesson. The second was the NASA-TLX (a workload stress index)
NASA-TLX

• A measure of subjective cognitive workload

• Noyes et al (2004) define cognitive workload as “the interaction between the demands of a task that an individual experiences and his or her ability to cope with these demands…” (p.111)

• Assesses subjective cognitive workload as a function of a series of demands – mental, physical, temporal, performance, effort, and frustration - which it presents on a series of indices.
Results

• The workload stress index detected changes in student performance

• Workload stress levels were not consistently influenced by lesson mode

• Average performance differed between lesson modes
The range of workload stress indices recorded was similar for both lesson types, although there were more high workload stress scores (>12) associated with paper-based lessons.
Scores of web-based lessons were more sensitive than paper-based lessons to increasing workload stress, but both fell sharply at high (>12) workload stress.
Scores from paper-based lessons were higher (~6/25; 24%) than those from web-based lessons, irrespective of the type of student
Why the difference in lesson mode scores?

- The negative impact of the web-based lesson on student mastery of the lesson material was not related to differences in prior learning or confidence between the groups or time spent on the lesson.

- Students of similar levels of confidence performed better if they completed the paper-based lesson rather than the web-based lesson.
Performance was not strongly linked to confidence
Workload stress was not strongly correlated with student confidence.
Why the difference in lesson mode scores?

- Differences in lesson quality is an unlikely reason as both lessons had the same content and structure.
- Written feedback from both online and paper-based groups was equally favorable.
What did you most like about the web-based lesson?

- The format was really good - teach it, practice it, test it
- Instant feedback - whether I was right or wrong
- The try it out and click to see if you are correct
- The way it stepped you through everything
- Really liked the structure, that you were able to 'try it out' before the test and if you still didn't get it you could go back and reread the lesson before the test.
- Doing the test, having examples made it clear where I was going wrong
- If I stuffed up I could try again until it sunk in
What did you most like about the paper-based lesson?

• The structure of the lessons made learning really easy
• The way it was structured (lesson, try, and test). Good way to learn
• I enjoyed reading through the material; it had a good structure and the pre-practice questions were great
• It highlighted where your gaps were and you could assess them and move on
• Concise, concrete explanations and examples. No unnecessary waffle (always a good thing!).
• The step by step process of learning and testing
Why the difference in lesson mode scores?

- Those who sat the lesson online were more likely to see the lessons as fun.

- Although students taking the paper-based lesson attained a higher level of mastery, several commented that the lesson would be even better if it was put online, because this would allow for a more immediate form of interactivity.
  - *This format of multichoice questions would be better on a computer. Answers could be marked automatically*
  - *Using different mediums (such as multimedia or web-based programs) may help people struggling with the subject.*
"... a more immediate form of interactivity"

- Some researchers have cautioned against developing interactive learning methods which do not give students time to reflect and consider their mistakes.

- The online lesson in this study provided a much quicker form of interactivity than the paper-based lesson - does quick responsiveness work against reflective learning?
Summary

- Test scores, particularly those from web-based lessons, tended to decrease as workload stress increased.
- Very high workload stress (>12) tended to be associated more with the paper-based lesson than with the web-based lesson.
- But, students doing the paper-based lesson had significantly higher scores than those doing the web-based lesson.
Conclusions

• Further research is clearly needed.
• This study should at least sound a note of caution: while there are many advantages to online learning, and students may enjoy the medium more than traditional modes of instruction, it is possible that the medium may be inhibiting the deep, reflective learning which is required for mastery of material.
Online vs paper-based formative assessment in the writing classroom

Lisa Emerson
School of English & Media Studies
Massey University
l.emerson@massey.ac.nz

Bruce MacKay
Institute of Natural Resources
Massey University