Does Online Submission and Assessment of Practical Reports Facilitate Higher Quality Learning by Students?

Gerry Rayner, School of Biological Sciences, Monash University
1. How do we know that students are mastering knowledge, skills and understanding critical to their future roles?

In the sciences, laboratory work assessed via:
- prac tests, posters,
- assessment of contribution,
- online quizzes / tests
- but usually…written reports, answers to qs – hard copy
2. How can tertiary teachers and university faculty design assessments that are both valid and practical?

- For written reports or answers to qs, how to provide effective “feedback for learning”? 
Contextual questions

3. What are the latest developments in innovative assessments in HE including peer and self assessment, assessing **large classes**, portfolio assessments, **e-learning tools**, and **authentic assessments**?

- How about electronic submission of work?
- How does it stack up?
Scope:

- The 1st year student cohort
- Assessment in the context of Monash guidelines
- Using a LMS for assessing student work
- Evaluation of new assessment program
- Refining the method
Pathways into Science

- VCE - ESL
- VCE, + biol
- VCE, - biol
- MUFY BIOLOGY
- IELTS
- TAFE
- 1st year Biology Students
- BIOMEDS
- BIOLOGY
- Other Sciences
Practicals – what do we want students to know / learn / attain / develop?

- Critical thinking
- Application of principles
- Application of lecture content
- Demonstrate understanding
- Team, lab skills etc
How should we assess this?

**Objectives of assessment**
- Provide feedback for learning (teaching)
- Connection between communication and notional development
- Assessment is a learning process in itself
- It should influence what students actually do!

**Methods:**
- Reflect objectives and teaching strategies
Monash assessment policy

Task outcomes:
Promote major learning dimensions – understanding, lifelong learning, engagement, innovation and globalisation.
Develop independence, various lifelong learning skills.

Considerations:
• educative role
• intellectual engagement
• feedback re their performance
• context for longer term learning
Previous prac marking paradigm

- Prac notes, instructions re assessment, prac attended
- Students write answers / report, submit in hard copy = paper
- Sorting, CB marking scheme, reports marked
- Reports marked, marks uploaded manually, pracs returned for pickup
- Much work never collected → poor value for $, poor learning outcomes
Issues

- Effectiveness → lots of students
- Non-uniform f/b – amount, quality, illegibility, etc.
  - marker training, marking schemes
- Plagiarism / cheating…little detected
- Long turnaround times
Issues

- Flexibility – students must be on campus to submit
- Cost – sorting, marking, returning.
- Sometimes, reports go “missing” …….
Are practicals too much bother?

Scale down lab work, or assessment of such
∴ some Uni Biology depts. phased out wet labs + prac reports.

To maintain wet labs, summative assessment
- allocation of $
- better training of markers
- communication, review, reflection
A Plan...use LMS dropboxes in 2004

- WebCT – the early days....
- Set up as an “Assignments” page in “Unit Content” of a WebCT Unit page for BIO1011
- Specify submission time, provide specific instructions re grade, tables or figures.
- Provide written and LMS guidelines, screenshots etc
Requires

- Working knowledge of LMS / CMS
- Marker access to LMS / CMS (sessional academics)
- Valid, accurate and accountable marking schemes
- Hard copy marks sheets
The Setup
<table>
<thead>
<tr>
<th>Title</th>
<th>Assigned to</th>
<th>Status</th>
<th>Due Date</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical 1 - Proteins</td>
<td>Michael Molina</td>
<td>Graded</td>
<td>13 March 2007</td>
<td>11.2/14</td>
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<tr>
<td></td>
<td>Nitesha Daniel</td>
<td>Graded</td>
<td>13 March 2007</td>
<td>12.0/14</td>
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<tr>
<td></td>
<td>Nicholas Fuller</td>
<td>Graded</td>
<td>13 March 2007</td>
<td>9.4/14</td>
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<tr>
<td></td>
<td>Pranitha Raja</td>
<td>Graded</td>
<td>13 March 2007</td>
<td>13.6/14</td>
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<td>Ramesh Karthik</td>
<td>Graded</td>
<td>13 March 2007</td>
<td>12.1/14</td>
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<td></td>
<td>Rajeev Khandel</td>
<td>Graded</td>
<td>13 March 2007</td>
<td>12.3/14</td>
</tr>
</tbody>
</table>

The All tab contains all submissions.

who, graded, when, mark
Q 7. Consider the following statements, and record whether each is true or false. (2.5 Marks total - 0.5 Mark for each correct answer)

a) Homologous chromosomes pair in meiosis but not in mitosis.
TRUE, in mitosis homologous chromosomes are unpaired. 0.5/0.5

b) Following both mitosis and meiosis, the daughter cells produced have the same number of chromosomes as the parent cell.
FALSE, in mitosis the daughter cell has the same number of chromosomes as the parent cell, but in meiosis the number of chromosomes in the daughter cell is halved. 0.5/0.5

c) DNA replication occurs during both mitosis and meiosis.
FALSE, DNA replication actually occurs in interphase. 0.5/0.5

d) Genetic recombination occurs during meiosis but not in mitosis.
TRUE, in mitosis there is no exchange of genetic material, as crossing over does not occur. 0.5/0.5

e) In both mitosis and meiosis, chromosomes are at their most compacted at metaphase.
TRUE, the process of compaction starts towards the end of interphase, chromosomes are just visible at the start of prophase, but the coiling process continues into metaphase. 0.5/0.5

Q 10. What proportions of waxy : non-waxy pollen are possible in a plant that grew up from:
(1.5 Marks).

a) a waxy kernel?
100% waxy or 1 1 non waxy : waxy. There is only one possible genotype of the parent plant (ww), as the condition is recessive. Therefore we would expect to see all waxy pollen = 100% w. 0.5/0.5

b) a non-waxy kernel?
Results

2004 marks (same markers, questions & cb. marking schemes) significantly higher ($P < 0.01$) than 2003.
Why?

Something about the students?
- smarter cohort?
  ENTERs 75.5 (2003), 74 (2004)
- cheating? No more than usual…
- affected by repeat students? No…
Possible explanations

Something about the markers?
• electronic marking interaction? unlikely

Or…….
1. More student preparation / effort?
2. Or, related…is the f/b ‘better’→ better idea of requirements / expectations?
Is it the feedback?

- stronger indication of requirements
- articulation, it’s explicit
- timely, non-judgmental

= acting **formatively** and **summatively**

Or, something else?
Student feedback

“Electronic submission of essays and practical reports is more convenient than submitting hard copies”.

“Electronic submission of essays and practical reports was simple to do”.

WebCT survey: n=318

% agree / strongly agree

83.4

89.1
“I received **better quality** F/B on electronically submitted practical reports than on hard copy materials”.

% agree / strongly agree

36.5
(38.7% neutral)

“I got **more** F/B on electronically - submitted practical reports than on hard copy materials”.

38.8
(35.8 % neutral)
Student feedback

“Overall, I prefer electronic submission of essays and practical reports to handing in hard copy materials.”

% agree / strongly agree

77.7
## Marker feedback

<table>
<thead>
<tr>
<th>Statement</th>
<th>% Agree / Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Electronic marking is more efficient than hard copy marking”</td>
<td>66.7</td>
</tr>
<tr>
<td>“I can provide more feedback using electronic marking than marking hard copy reports”</td>
<td>83.4</td>
</tr>
</tbody>
</table>

Hardcopy survey: n=12
Marker feedback

“I can provide higher-quality F/B using electronic marking than marking hard copy reports”.

“Overall, I would prefer to mark electronically than hard copy”.

% agree / strongly agree

75.0

83.4
Benefits

- More feedback + better quality F/B?
- Removes bias high grades = neatness factor
- Plagiarism checks easy – Turnitin®
- Saves $ - no sorting
- more reports marked per hour
Benefits

- Marks uploaded to LMS gradebook
- Shorter turnaround time - F/b provided sooner
- Saves paper … >30,000 sheets yr\(^{-1}\)
- Saves students $
- Reports don’t go “missing” - submission confirmed by email… but…
• time consuming, repetitive downloading reports and uploading graded reports
• logistics - tracking students who swap sessions….multiple prac sessions
• hard on the eyes e.g. essay-length docs
• less personal? Electronic comments might come across as ‘mass produced’?
Limitations - management

- file formats (e.g. ‘.wps’, ‘.wpd’)
- matching hard copy and electronic components
- markers ‘miss’ reports, upload incorrect graded file etc.
- WebCT downloads files into individual student folders – further time required.
Blackboard

- We’ve come a long way, BUT…
- Vista – provides for ‘grouping’ for multiple prac sessions in a week.
- Improvements - templates of questions and tables etc for submission etc.
In summary

- lots of benefits and unanswered questions
- LMS system still v. clunky..e.g.
- requirement for seamless submission

Currently - ‘hybrid’ → balance between LMS submission and hard copy (end of prac, drawings, pre-lab questions, quiz), but also teamwork, use of equipment, group work
Thank you

Questions?