Response to scenario-based content delivery as an additional resource in a First Year Human Bioscience University Course

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The initiative

• Does the use of supplementary material presenting content in context by way of a scenario enhance student knowledge, understanding and performance in first year university human bioscience students?

• Do students show a preference for this style of supplemental material?
Background

• The initiative is one of a number of ongoing responses to a decreased pass rate in a first year first semester Human Bioscience course

• Previously addressed by introducing weekly online revision assessments, tutorials, and concluding that these alone did not improve pass rate

• More strategies were needed to improve learning and understanding and hopefully pass rates

• Dr Isabelle Lys (Hoong) now at Charles Darwin University proposed the introduction of scenario based learning
Strategy

• Initially one topic selected – Endocrinology
• Selected as a topic that we perceived students were struggling with
• The perception is reflected in the average mark for topics in final exam out of 10:

<table>
<thead>
<tr>
<th>Year</th>
<th>Cell</th>
<th>Renal</th>
<th>Repro</th>
<th>Cardio</th>
<th>Endocrine</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>7.5</td>
<td>6.4</td>
<td>6.6</td>
<td>6.3</td>
<td>6.1</td>
</tr>
<tr>
<td>2010</td>
<td>7.2</td>
<td>6.9</td>
<td>5.6</td>
<td>5.8</td>
<td>5.1</td>
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• and we were wanting to enhance student learning experience and understanding
Endocrinology – how it is taught

• Introduced in week 1 as part of an overarching concept (homeostasis) that students (knowingly or unknowingly) have an awareness of

• Is reintroduced throughout the course as other body systems are taught

• Consolidated at end of course in three one hour lectures

• At this point, an additional scenario based resource for learning is introduced, ‘Joe’s Life’
What is Joe’s Life?

• A series of scenarios presented in Moodle using two well known (to me!) characters and a young couple Joe and Flossie experiencing everyday events that are explained in every day terms and backed up by a scientific explanation

• Students are asked a series of questions for which there is immediate feedback as they progress through the scenario

• Students are encouraged to copy their answers to a file that when completed provides a summary of the topic
What is Joe’s Life? Example Scenario Opening

Dudley: ‘Why is it when I have few drinks that I urinate more?’
Pete: ‘I suppose if you put more in, you put more out to keep some sort of balance.’
Dudley: ‘That seems a balanced idea.’

Define homeostasis, hydration and dehydration. These are all terms relating to "balance":

Submit
What is Joe’s Life? Follow Up Page

• Submission Accepted. The following feedback is provided. Define homeostasis, hydration and dehydration. These are all terms relating to "balance":
Your Response Homeostasis is .... Hydration is .... Dehydration is....

• Feedback
Keeping the body in balance for optimum function is known as: **Homeostasis**
Hydration is… too much water or dilute body fluids
Dehydration is….too little water or concentrated body fluids

Water balance is just one part of homeostasis. Too much water, hydration makes the body fluids dilute. Too little water, dehydration makes the body fluids concentrated. Just the right concentration is needed for optimum function.

• click on the action "What keeps the balance?" to continue...
What We Did

• Scenario based learning was developed to complement the new learning in the lectures

• We were introducing SBL to first year first semester (mostly) inexperienced science students

• This is unlike many other examples of SBL where taught existing knowledge is consolidated and applied

• So what existing knowledge do these first year first semester inexperienced science students have?

• Varied - this is the reason for why SBL was used to complement lectures and not as a stand alone learning tool
Evaluation

• Student use of the scenario
• Analysis of the selection bias and performance on the final exam questions related to endocrinology
• Online questionnaire for students at end of course

Two cohorts of students
- summer school distance
- semester 1 on campus first year students
Student use of the scenario software

Semester 1 2011 intake 281 students – 138 students viewed Joe’s Life:

<table>
<thead>
<tr>
<th>Visits to Joe’s Life</th>
<th>Number of Students</th>
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<tbody>
<tr>
<td>1</td>
<td>65</td>
</tr>
<tr>
<td>2</td>
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</tbody>
</table>
Selection of endocrinology in exam
Percentage of students attempting questions

Summer school
Semester 1

- Cell
- Renal
- Repro
- Cardio
- Endocr

2008 2009 2010
2009 2010 2011
Performance in the final exam
Mark out of ten

Summer school

Semester 1

- Cell
- Renal
- Repro
- Cardio
- Endocr
Too Many Variables including...

- **Staff changes** – two of the three staff teaching on the paper have left since the commencement of the project.

- **Semester 1, change in student selection criteria for Nursing (50% of students)** – now require a science subject at year 13.

- **Change in Government funding restricted 2010 summer school enrolment**

- **Topic questions vary each year** – content appears to influence student selection.

So what do the students think?
The Questionnaire

Return rates

- Summer School 2010  33%  (17/51 students)
- Semester 1 2011  13%  (35/278 students)

Percentage of students who used Scenario

- Summer School 2010  59%  (10/17 students)
- Semester 1 2011  66%  (23/35 students)
The Questionnaire

Ease of use?
  • 88% rated 1 – 3 (easy) on a 1 – 7 scale (easy to difficult)

Help you learn?
  • 75% rated 5 – 7 (lots) on a 1 – 7 scale (not at all to lots)

Efficient learning?
  • 75% rated 5 – 7 (very efficient) on a 1 – 7 scale (not efficient to very efficient)
The Questionnaire

Enjoyable learning

• 56% rated 1 – 3 (very enjoyable) on a 1 – 7 scale (very enjoyable to not enjoyable)

Would you use for other systems if available

• 86% Yes

Overall a positive response from those using SBL

Is this supported by student comments?
The Questionnaire Comments – likes

- Gave me real life examples which always helps me learn and remember concepts
- Humour, ability to go back and change answers, read an explanation about answer
- It was enjoyable and taught at the same time. You could compare your answers easily to the proper answers
- The real life examples and the way that science concepts were explained in simpler language
- I really found this helpful and I really hope you create more of these
The Questionnaire Comments – dislikes

- Always having to type something in a box even if you did not know the answer
- A little bit long winded
- Being technologically challenged, I couldn’t figure out how to cut and paste into word so had to write everything down, it was very time consuming
- I have slow internet, I got fed up waiting
- Too wordy to type stuff in
The Questionnaire - improvements

• I think they should give more information about the topic and THEN ask the questions to see how much you remember from the teaching

• Keep it more to the point

• Short or one word answers better

• It might be nice to skip to different parts when you want to look at one thing in particular, but then to have go through all of it to get to one part made me learn the rest of it better
Student Evaluation - Questionnaire

- The online questionnaire provided to students at the end of the course suggests that:

Scenario Based Learning is worthwhile as an additional resource for first year human bioscience students
Finally Feedback – the positives that keep us going

• I just did Joe's life and it was sooo good.
  Laura

• I did ‘Joe’s Life’ this morning – I loved it!! Will have to go back to it though as didn’t quite manage to finish. It was so engaging!! I could explain to a colleague at work the whole process of weeing – he was most appreciative. Those type of exercises are great for manic people like myself who can read for half an hour before realising I am not taken in anything.
  Jude
Acknowledgements and Thanks

• Dr Isabelle Lys, Charles Darwin University whose idea it was to explore Scenario Based Learning as an additional resource for our first year students

• Ako Aotearoa for providing funding and support for making the idea a reality for the students

• The students who willingly entered into “Joe’s Life”

Thank You for Listening
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