Performance enhancers: Creating and using mini online modules to improve learning

Kelly Anthony, Applied Health Sciences
Andrew Laing and Justin Yates, Kinesiology
Christine Zaza, CTE
“be a leading provider of technology enabled learning opportunities.”
Blended learning

- integrate face-to-face and online learning
- challenges
- proven benefits
“Biomechanics is cool.”
“Some really neat applications in diving”
LITE Seed Grant, Winter 2014

“Blended Learning: Development and Evaluation of E-modules to Enhance Undergraduate Learning in Biomechanics”

Andrew Laing, Justin Yates, Kelly Anthony, Brett Beston (Christine Zaza)
Purpose:
“To develop, implement and evaluate the effectiveness of E-Learning Modules within an introductory Biomechanics course.”

Hypotheses:
1) students would enjoy the E-modules
2) accessing them would be associated with improved grades
3) a dose-response would exist.
May
Poll recent cohort

June – Aug
Develop E-modules

Fall term
Implement and Evaluate
May
Poll recent cohort

June–Aug
Develop E-modules

Fall term
Implement and Evaluate
May
Poll recent cohort

Most Challenging Concepts
Rigid Link Modelling
Projectile Motion
Moment of Inertia
Angular Momentum
May
Poll recent cohort

June – Aug
Develop E-modules

Fall term
Implement and Evaluate
Computing Help & Information Place (CHIP)
East Campus 2 (EC2 Foyer)
helpdesk@uwaterloo.ca
ext. 44357
Angular Momentum snippet (1:29-2:30)
It’s go time

May
Poll recent cohort

June – Aug
Develop E-modules

Fall term
Implement and Evaluate
Implement

Four E-modules
Learn access
Not flipped
Tracked access

Fall term
Implement and Evaluate
Evaluate

Post Survey in Class
Links with Grades
- Final
- Content-specific exam questions
Survey Results

+ ratings related to improved learning

Q3 - improve your understanding?

- NA: 15
- Not at all useful: 1
- Somewhat useful: 28
- Useful: 54
- Very Useful: 28

Survey Results

UNIVERSITY OF WATERLOO
FACULTY OF APPLIED HEALTH SCIENCES
+ ratings related to improved learning

Q4 - helped improve marks?

<table>
<thead>
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<th>Rating</th>
<th>Count</th>
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<tbody>
<tr>
<td>NA</td>
<td>15</td>
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<tr>
<td>Not at all useful</td>
<td>5</td>
</tr>
<tr>
<td>Somewhat useful</td>
<td>44</td>
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<tr>
<td>Useful</td>
<td>66</td>
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<tr>
<td>Very Useful</td>
<td>9</td>
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</table>
Students would like more E-modules

Q8 - Like more 121 modules?

- No: 12
- Yes: 68
- Maybe: 40
Students would like more E-modules

Q9 - Sim mods in other courses?

<table>
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<th></th>
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Survey Results
Evaluate

Post Survey in Class
Links with Grades
- Final
- Content-specific exam questions
72% viewed at least 1 E-Module

<table>
<thead>
<tr>
<th># of E-Modules Accessed</th>
<th># of students</th>
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<tr>
<td>0</td>
<td>61</td>
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<tr>
<td>1</td>
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<td>4</td>
<td>78</td>
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<td>total</td>
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Module viewers had 2.2% higher final grades.

Final course grade for those who did vs. did not view E-modules.

- Grades for those who viewed modules: 75%
- Grades for those who did not view modules: 65%

p = 0.071
0.6% increase for each module viewed

Grade Results

\[ y = 0.569x + 73.303 \]
\[ R^2 = 0.0091 \]
Effects larger for targeted exam questions

e.g. MT#2 overview question

Average KIN 121 Grade (%)

P = 0.114

64.72

60.04

Yes (1-4) N = 155

No (0) N = 61
Lessons Learned

- Provide online technical support
- Scope of project – define and stick to plan (ethics)
- Large variability in dose-response
- Module quiz data – analysis issues
- Capstone Module – how to make an E-module

https://youtu.be/G48Yl4CY40g
Summary

- This study supports the effectiveness of blended learning through E-modules
- Students perceived them to enhance their understanding and grades
- Students wanted more modules
  - In this specific course, and in other courses
- Grades generally increased for those who viewed the modules
Next Steps:

- Department of Kinesiology committed to E-Learning initiatives
  - Video modules in several courses

- Online learning repository
  - Resources accessible throughout student career

- New LITE Seed grant
  - AHS Teaching Champions, identifying facilitators/barriers to innovative teaching
Acknowledgements:

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- Department of Kinesiology, Faculty of AHS