Hybrid-PBL for Sustainability Education

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Hybrid-PBL for Sustainability Education

• Three-year project entitled: ‘Hybrid problem-based learning: a scalable approach to sustainability education?’
• Funded by the UK Higher Education Academy's (HEA) National Teaching Fellowship Scheme (£300,000)
• A collaboration between Keele University, University of Manchester and Staffordshire University

Project Aim
To explore effective ways of adapting traditional problem-based learning approaches for the delivery of transformative sustainability education to large student numbers.
Why?

- Sustainability literacy (ESD) is a major and expanding issue for Higher Education in UK
- Problem-based learning (PBL) approaches are highly effective at enabling deep and transformative student learning
- PBL has been considered an ideal approach for tackling the complex, multidisciplinary problems of sustainability

Traditional PBL is very resource and time intensive
Problem-based learning (PBL) is a collaborative and participatory student-centered approach to teaching and learning, based on group work and problem exploration.

Students typically work in small groups of 6-10 with a trained team-work facilitator. Teams investigate ‘problems’ or ‘scenarios’ related to their course and devise recommendations and solutions to the problems.

Teams: Highlight and clarify unfamiliar terms and concepts
Define the nature of the problems and issues for exploration
Analyse and brainstorm the problems/issues, possible solutions, explanations and actions
Formulate learning objectives and questions for further research

At subsequent sessions students share the results of private study, cite resources and discuss findings and ideas by going through the agreed learning objectives and questions.

Students are encouraged to exchange ideas, feelings, information and insights and to reflect on their own experiences in order to build a new collaborative level of understanding.
Hybrid-PBL

• Traditional PBL + adaptations
• Online learning technologies and a range of class-based learning approaches
• A mode of PBL delivery which is suitable for sustainability education, which is less resource intensive and has the potential to be scaled up to large cohorts of students
• Trialled several adaptations to traditional PBL approach:
  – Fewer face-to-face timetabled module hours
  – Fewer facilitators per module
  – Less face-to-face facilitation (coaching) with individual groups
  – Range of group sizes
  – A mixture of approaches in class - including: traditional PBL problem solving; individual group and whole class discussions and debates; mini-lectures; outside speakers/presentations; videos; student presentations; general group project work.

• Online PBL...
### The Universities

*Three modules at three different universities*

<table>
<thead>
<tr>
<th>University</th>
<th>Module Title</th>
<th>Module Length</th>
<th>Year Group</th>
<th>Nationality and Discipline Mix</th>
<th>Aim of Module</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Keele University</strong></td>
<td><strong>Greening Business: Employability and Sustainability</strong></td>
<td>12 weeks, 1 hour per week</td>
<td>Foundation and 1st Year</td>
<td>Up to 10 Nationalities Up to 18 disciplines on module</td>
<td>Introduce students to the environmental and sustainability responsibilities of business and the motivations of organisations to engage with this agenda. Equip students with the basic skills and awareness to drive sustainability improvements in their future workplaces.</td>
</tr>
<tr>
<td><strong>The University of Manchester</strong></td>
<td><strong>Project Managing Humanitarian Aid</strong></td>
<td>12 weeks, 2 hours per week</td>
<td>Masters</td>
<td>Up to 10 Nationalities Up to 4 disciplines on module</td>
<td>To develop professional skills in students and to introduce them to the main concepts of, and barriers to, humanitarian aid projects in a complex world. Through tackling a series of small-group projects, students study the concepts of stakeholder engagement and the interaction of economic, environmental, legal, political, social and technical aspects of setting up humanitarian aid projects, with a view to developing abilities and skills for assuming professional responsibilities in their future careers.</td>
</tr>
<tr>
<td><strong>Staffordshire University</strong></td>
<td><strong>Greening the Campus</strong></td>
<td>12 weeks, 1 hour per week</td>
<td>1st and 2nd Year</td>
<td>No data</td>
<td>The aim of this module was to deliver sustainability teaching to students across a range of subjects as a university-wide elective module. In small working teams students work on campus-based projects aimed at informing and changing the sustainability behaviours of first year students. The projects were local biodiversity, energy, waste and food.</td>
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Using Technology and Social Media

1. Virtual Delivery of Module Content

- In traditional PBL, module content is not ‘delivered’ in the same way as in lectures
- **What if students don’t learn everything they need to know?**
- PBL emphasises skills not just content
- There may be times when certain levels of content knowledge are vital
- Some traditional module content is delivered online before PBL classes
- Students learn core background topics and concepts online
- Brings students from different disciplinary backgrounds to a more level playing field

**PowerPoint – Podcasts - Screen casts**
Using Technology and Social Media

2. Online Student Communication, Collaboration and Facilitation

- **Online Student Communication and Collaboration** - chatting, sharing ideas, posting research, discussing assessments, sharing websites, producing group work

- **Online Facilitation** - facilitating group process and PBL learning environment; monitoring and steering student discussions; providing guidance and case study data; helping to resolve group conflicts; providing group support and answering questions.

**PBL facilitator is part of online PBL-group discussion space**
Performs all the same functions but online

- **Asynchronous Tools used**: Instant messaging or ‘chat’, e.g. Skype, Facebook, msn, Virtual Learning Environment (VLE) chat; group video calling in Skype

- **Synchronous Tools used**: Discussion boards/forums/threads, e.g. VLE, Facebook groups; group email; Google docs and wikis
Results

1. Virtual Delivery of Module Content

“The information is clear and useful. I can download the podcast anytime and listen to it wherever I want.”

“Listening to the podcasts was very convenient as you could do so in your own time. I found them a useful way of receiving a good overview of a topic that then allowed you to do your own personal research afterwards when you found an aspect interesting”.

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Results

2. Online Student Communication, Collaboration and Facilitation

How effective did you find the online group working aspects of this module (e.g. Blackboard group discussion boards, group email, Facebook groups) for investigating your group tasks and carrying out group work? (1 = Not effective at all, 5 = Very effective)
The Power of Facebook...

Preference for tools otherwise used for social networking, e.g. Facebook, Skype, email, Whatsapp

“Blackboard proved to be more difficult for communicating, so my group switched to Facebook. Once we used Facebook we all found communicating quick and effective”.

“The functions are rigid and limited compared to other online platforms”.

“All of our group meetings, group works and group documents are planned and shared by Facebook. It is convenient and updated easily every day.”

“People are always on Facebook so it was fast to communicate. It helped the group to keep in contact regularly and research was posted on the page so the was effective communication between ideas”.

“I liked the way we could easily communicate with the facilitator via Facebook as this meant we got quick and effective replies to any questions we had.”

Q7. My group used additional online tools (e.g. Facebook) to collaborate online. (14/15 agree)
Employability

Employability Skills (taken from 2012 student questionnaire):

Q: Do you feel that you have gained any skills as a result of this module that will improve your chances of getting a job or enhance your performance at work, now or in the future?

A: Keele: Yes 69%; No 11%; not sure 20%
Manchester: Yes 93%; No 2%; not sure 5%
Staffordshire: Yes 81%; No 0%; not sure 19%

Q: Has this module made you think about your future career plans in any ways?

A: Keele: Yes 51%; No 26%; not sure 23%
Manchester: Yes 67%; No 10%; not sure 23%
Staffordshire: Yes 38%; No 24%; not sure 38%
Do you feel that you have gained any skills as a result of this module that will improve your chances of getting a job or enhance your performance at work, now or in the future?  KEELE 2013

- I have gained experience in worrying less when working in a team and confidently presenting my findings and ideas.
- Working in a team during this problem has helped me to communicate better with the people that I work with, which is crucial in a workplace environment.
- Taking upon a responsibility for a certain topic within group work and delivering it on time. Time keeping and group skills improved.
- Oral presentations have helped me to gain confidence and the skills of a producing a video.
- I have become more confident when having to speak in front of groups of people (e.g. oral presentation) which could be useful during job interviews and work itself.
- Every experience is a lesson. This class has helped me a lot by helping me see what I show most interest in & how I work. The topics covered were helpful in providing this outlook.
- I want to be a manager, so I think that now knowing about the benefits of making a business sustainable will help me if it should come under my role to deal with it.
Do you feel that you have gained any skills as a result of this module that will improve your chances of getting a job or enhance your performance at work, now or in the future? MANCHESTER 2013

- I learnt how to work with people with diverse background and how to make a good proposal to right audience. etc.
- The teamwork is a important skill that can improve the work performance. The effective discussion and negotiation can help us to find the expected goal at work.
- I feel that I have improved my leadership skills. Team working capabilities are another area of improvement.
- I learned how to respect others efforts.
- Firstly, the great chance to communicate with multicultural people in this course is really helpful. Then, the skills of researching resources and writing report enhance my study abilities. Also, the problem-based method and the reflection of myself could be useful in my further study.
- So far, there has been tremendous improvement in my professional and personal skills
- To work with others, and share ideas with others as well as accept other's ideas.
Employability (2013 questionnaire)

Please indicate the extent to which your skills have changed or stayed the same as a result of this module. (Please tick one box for each statement)

- Working in a team on a group task
- Problem solving when presented with a task
- Researching around a topic or issue
- Listening to others opinions and respecting people’s differences during...
- Effective discussion and negotiation within a team
- Communicating your point of view to a wider audience, e.g. oral prese...
- Communicating and working with others using online technology
- Reflecting on what you have learnt
- Applying new knowledge and skills to other situations

Skill worsened
Skill stayed the same
Skill improved
Skill improved greatly

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Employability

Comment from a student heading for a job interview part-way through the module:

“I would like to point out that having conducted already some interviews and assessment centres in applications in companies [to which I had] applied, I see how helpful for me is the module ... I am more confident (than before taking the module) to work in a team, to co-operate, to try making compromises and negotiations in order to prevent conflicts etc. Overall, the scheme on working as a team in various projects is very helpful for my future career in the companies I pursue to work, so I am really happy and satisfied with this module which is totally different learning procedure than other modules. Hope this is to be seen also in my reflective practice and my personal skills development during the team exercises.”
Acceptability

To what extent do you feel your understanding and knowledge of humanitarian aid issues has increased as a result of this module? (Please choose one option)
Acceptability - Group work

Did you enjoy working in a group? (1 = Not at all, 5 = Very much)

Did your group work well together? (1 = Not at all, 5 = Very well)
Acceptability

• “This module is more practical and so more useful than other modules. My view is that sitting in lectures is meaningless, because you forget the information but only a few points stick in your mind. You remember more from this module. In this course when you solve a problem you never forget how you solved the problem”.

• “I am more confident (than before taking the module) to work in a team, to co-operate, to try making compromises and negotiations in order to prevent conflicts. Overall, the scheme on working as a team in various projects is very helpful for my future career in the companies I pursue to work, so I am really happy and satisfied with this module which is totally different learning procedure than others.”
## Acceptability – Nominal group

<table>
<thead>
<tr>
<th>Positives</th>
<th>Negatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Self reflection</td>
<td>- Poor group dynamics</td>
</tr>
<tr>
<td>+ Critical thinking</td>
<td>- Tight deadlines</td>
</tr>
<tr>
<td>+ Team working</td>
<td>- Hard work</td>
</tr>
<tr>
<td>+ Skills development</td>
<td>- Lack of clarity</td>
</tr>
<tr>
<td>+ Multi-cultural</td>
<td>- Time consuming</td>
</tr>
<tr>
<td>+ Understanding complexity</td>
<td>- Cultural differences</td>
</tr>
</tbody>
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Summary

- This approach has been applied in different global societal contexts and with different student groups in different universities;
- The results show that technology can be usefully employed to facilitate the Hybrid approach;
- The results also show that the PBL approach has successfully embedded:
  - Skills to merit professional recognition;
  - Research and information-seeking skills;
  - Problem identification and resolution skills;
  - Intercultural and interdisciplinary communication skills;
  - Teamwork skills;
  - Skills of reflection and self-improvement;
  - Skills to cope with managing change.
Merci
Thank you

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