

The impact of technology on the teaching and assessment of 'systems' diagrams in two online environmental management modules

Andy Lane



The Open University

Introduction

Diagramming is a process where the context and tools used to create the diagram may hinder or help students in learning both how to create diagrams that represent a situation and how to learn about diagramming and the situation at the same time.

There is a long history of teaching and researching 'systems' diagramming as a 'thinking and doing' technique at the Open University (Lane, 2013; Blackmore et al, 2015). A recent manifestation of this has been two mainly online undergraduate modules dealing with environmental management (T219 and T319), where students share diagrams with other students throughout the duration of the module, have to work collaboratively on diagrams in small groups for one part of the module and include diagrams in all assignments.



Methods

The study looked at students' experiences of using diagrams and in particular the part that familiarity, experience and confidence in the technique and the technology played in supporting learning.

The findings draw upon student postings in online forums; on samples of assignments with specific questions about diagramming as a practice; an online survey of students who studied one or both of the modules; and telephone interviews with a small sample of students and tutors.

Results

Few students were familiar with the type and nature of the diagramming techniques involved in these modules before they studied these modules:

'As someone who doesn't draw or have any past experience of using diagramming I initially found the use of systems diagrams to be a challenge.'

In terms of learning about the necessity and mechanics of diagramming students seem to very much like the printed resource book over the online materials.

'I actually thought the resource book was probably the thing that helped me the most because it was fairly succinct and it had got lots of examples in it of how systems diagrams... first of all how systems thinking works and why it is important and second how systems diagrams need to be put together.'

The problems with the Display Wall, difficulties with creating digital copies of diagrams, the limitation of sharing and discussing diagrams in online tutorials and within the group work, also appear to hinder learning about the value and relevance of diagramming for improving their own learning in general and for use in environmental management in particular.

'The gallery where we were supposed to upload our diagrams was ineffective as a collaborative learning tool as no-one commented on posts, despite requests for feedback. This site also became an obstruction to learning when working on the collaborative task as students posted their diagrams here while others posted them as attachments to conversation threads. Posting diagrams here did not contribute to my learning about the course content. I ceased to use it eventually as it provided no additional benefits. The navigation was clunky and the smiley/sad face indicator useless.'

While many did gain value from, and see relevance in diagramming, it looks as if the number of diagrams to learn about, and the number of diagrams that needed to be produced throughout study of the modules, contributed to a significant intellectual and practical time

burden that may have contributed to the more negative views expressed, with technology a contributing factor.

'Also the other thing I found in the course generally; the amount of reading material, the material that you actually read through was, compared to other courses that I have done, excessive I thought. It was just difficult to get to... you had to get all the reading done that you needed to and cover all the various exercises and that that you were doing as you went along so the course became very very intensive and I know from comments on the forums during the course, from other students, they also found the same thing; the course content was rather heavy.'

Despite this array of factors that has hindered students' learning about diagramming most claimed that they were very likely to continue using them in their studies and possibly in their work. For a few diagramming was seen as a waste of time anyway and the technological issues just seem to have compounded this negative view.

'I now use systems and spray diagrams along with rich pictures in my day to day work. I run continuous improvement workshops and find these methods well accepted by the attendees.'

'Because I don't understand them, didn't find them helpful or useful, found them complicated and time consuming and I don't see a place in my future studies or career for them'

In conclusion, technology in this case is at best an enabler but not an enhancer for teaching and learning this particular practical technique at a distance.

References

- Blackmore, C., Reynolds, M., Ison, R. and Lane, A. (2015). Embedding sustainability through systems thinking in practice: some experiences from the Open University. In: Wyness, Lynne ed. Education for Sustainable Development Pedagogy: Criticality, Creativity, and Collaboration. PedRIO occasional papers (8). Plymouth University: Pedagogic Research Institute and Observatory (PedRIO), pp. 32–35
- Lane, A. (2013) A review of diagramming in systems practice and how technologies have supported the teaching and learning of diagramming for systems thinking in practice, Systemic Practice and Action Research, 26:319–329