
Designing for Reflection, Sustainability and Simplicity

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Abstract

There are a number of ways in which technology is, and could be used to promote reflective thought. These techniques may well be applicable for designers hoping to promote sustainable living. This paper briefly outlines a landscape for supporting reflection with technology, relates it to sustainable HCI research then raises issues to do with reflection and simplicity for discussion.

Author Keywords

Reflection; Design; Sustainable HCI.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Design, Human Factors, Theory.

Introduction

Having spent much time exploring how a wearable digital camera (SeneseCam) might support teachers' reflection on practice [1,3] I expanded on this to begin to sketch out a landscape of how technology is being, and could in the future be used to support reflection for a wide range of purposes [2]. Though I have not looked at it yet, one such purpose could of course be to

promote sustainable living. I will start this paper with a brief outline of this landscape, then go on to discuss how it is applicable to sustainable HCI research. Finally, I raise for discussion some issues related to reflection, simplicity and complexity.

Technology to Support Reflection

What IS reflection?

This thorny issue is one I've spent much time thinking and reading about. In the end the definition that seems to work best for me is that reflection is "serious thought or consideration" (Compact Oxford English Dictionary, Accessed 2010). Different kinds of thought are often considered more reflective than others – in more formal reflective literatures, types of thought are often classified in a hierarchical way with low levels forming the foundations for higher levels of reflection, which are generally thought to be more worthwhile (e.g. [5]). An example framework I derived from the literature describes 5 levels (R0 being the lowest)(see [2]). Briefly, R0 is description (not usually considered reflective): description or statement about events without further elaboration or explanation. R1 is descriptive reflection: description including justification or reasons for action or interpretation, but in a reportive or descriptive way. No alternate explanations explored, limited analysis and no change of perspective. R2 is A different level of thinking about. Looking for relationships between pieces of experience or knowledge, evidence of cycles of interpreting and questioning, consideration of different explanations, hypothesis and other points of view. R3 is transformative reflection: revisiting an event or knowledge with intent to re-organise and/or do something differently. Asking of fundamental questions and challenging personal assumptions leading to a

change in practice or understanding and R4 is critical reflection: where social and ethical issues are taken into consideration. Generally considering the (much) wider picture.

In mapping out a design landscape for reflection, I considered how technology is or could be able to support reflection at each of these levels.

R0:Technology for Revisiting

Technology can be used as the tool through which knowledge and experience is recorded: it can act a sort of external, electronic memory of events. Whilst simply remembering would not be considered reflective by many scholars who have an opinion on this matter (e.g. [5,6]), a record of events can form the basis for reflection. Lifelogging can be considered an extreme version of this, where all available data from everyday life is recorded. As well as providing a text based record, technology can be used to create visual/audio records, and more: new forms of information can be captured through the use of sensor devices, wearables and much richer context information can be captured. This allows access to information that might not be perceptible or available to normal memory.

R1:Technology to Prompt Explanation

A standard technique for prompting people to reflect by coming up with explanations or justifications for events or knowledge is to ask them reflective questions. These are questions to get people to think about the issues important for the particular purpose of reflection being encouraged, and can be incorporated into technology in various ways. For example, pop up windows in interactive learning environments, experience sampling

questions sent to mobile devices and/or triggered by context.

Another person can prompt explanations or justifications either by asking for them, or just by virtue of being there as it makes sense to explain things to others, especially if it is known they do not share the same background knowledge or experience.

R2: Technology to See More

Reflection which involves a questioning of events, a consideration of different explanations, hypotheses or points of view can be encouraged by techniques which enable the 'seeing of things from multiple perspectives'. Technology can do this in a number of ways, for example: by producing a record that can be looked at again, possibly in a different way; by allowing you to see things you could not possibly be aware of on your own (e.g. sensor readings, video of things going on behind your back); by allowing the reorganization of material to see it in a new way (e.g. concept mapping and data visualization tools); and to experiment with cause and effect at a different time scale or in a way otherwise not possible in the real world (simulation tools).

In addition, any of the above can form the basis of discussion with another person who can help you interpret events in a different light.

Seeing from another perspective in the ways described above can in turn lead to further reflection through consideration of different points of view, which can lead to the consideration of multiple hypotheses to explain what's going on. Where this extra information does not fit with existing hypotheses or explanations of events,

multiple perspectives can prompt a questioning of knowledge and even a questioning of events.

R3&4: Technology to promote further reflection?

Reflection at these levels follows from the processes of levels 0-2 where the resources available for reflection are engaged with at deep levels. For example, seeing from multiple perspectives above can also lead to a challenging of original assumptions or interpretations of data as reflectors question and consider alternative explanations and hypotheses. Challenging of original assumptions can in turn lead to a fundamental change in understanding, which can lead in practice settings to a change in that practice. From experience, and in looking through the literature, it is not clear what role technology has in supporting these higher levels of reflection, which require as their foundation the lower levels. Arguably the main role for technology is in supporting these foundational processes of reflection.

Reflection and Sustainability

When this reflection landscape was first presented at OzCHI in 2010 [2], it was, interestingly, placed in a session called 'Sustainable Design' – probably due to the word 'landscape' in the title. This is, to date, the closest my research has got to the issues of sustainability. A brief look at the literature (e.g. [4]) though immediately makes clear that many approaches to sustainable HCI encompass aspects of designing for reflection.

For example, many ambient awareness or persuasive systems involve providing sensor readings or other recordings of people's lives and activities in order that they might understand more about what they are doing and the consequences of this. The aim is hopefully that

they will consider alternate points of view, perhaps challenge their original assumptions, and ultimately transform their behaviour. It may well be that any approach which attempts to raise people's awareness of sustainable issues and reflect on these in order to change behaviour could benefit from a consideration of the reflection literature.

Reflection and Simplicity?

I find the relationship between reflection, complexity and simplicity a confusing one. I realize that most of the methods outlined above are more focused on providing material which is the basis for reflection, structuring reflection, and encouraging reflection by raising awareness of the fact there is something to reflect about. Arguably, these methods all work by *increasing our awareness of the complexity of life*. Whilst they perhaps encourage people to make time to reflect on certain issues, they don't actually make time for reflection (in fact, in increasing the complexity of our life, they may be reducing it) – and time is something we need if we are to reflect [6]. I would like to discuss further the suggestion Pheobe Sengers made [7] - is it possible that technology might actually make us time for reflection? Could this be through simplifying our lives? Should or could this simplification occur by using technology to remove choices and contrary to what I have said above, remove some of life's complexities? Perhaps this is an issue of purpose of reflection – we simplify some aspects of our lives in order that we may spend more time thinking about other aspects. If this is the case, how then do we decide what to spend time thinking about, and what not to? Who should make these decisions? Are we not, again, just increasing the complexity of our lives? Can we use technologies to make decisions once, then rely

on the technology to take over some of this responsibility reassured that it is doing so based on our values? Is this not what we do already, everyday?

I think an understanding of some of these higher level issues are important to make progress in this field. It is not just technology that needs to be designed to promote good reflection, whatever it's purpose: it is the whole framework and structure within which the technology is used. After all, it is not the technology that does the reflection. It can only provide the resources and support the conditions for reflection. It is ultimately people who need to do the reflection, and we who will or will not change our lives as a result.

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