

Research Methods:

Specific to Computing

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Background to this part of the course

- You have already have been given an introduction to generic research approaches which may be pertinent to computing, IT, software engineering and Smart projects.
 - These could be: case studies (many real world projects), action research (where you impact the environment), empirical approaches (experiments and quasi experiments, survey and so on), and mixed method research.
- Our observation (over many years) is that the framing of the research questions and so on is often the most difficult,
 - ...and then the alignment of the research questions to the units of analysis: data collected, analyses and findings is also problematic.
 - A classic case would be that the data collected does not allow the student to answer the question posed (honestly people really do this).
- In addition, that validity is often overlooked.

Aspects of the project

- Taken as read that students can build (an u/g skill), but still a strong expectation of an ‘artefact’, which may be a piece of software or a software development product.
- Projects at Masters still need an additional ‘research’ element.
- Questions to consider include:
 - What is interesting about the project
 - Where does it sit within the discipline, literature, etc.
 - What is the ‘angle’?
- Hence, a wide variety of possibilities in research approach (and methods), subject matter, and product.

- To support the development of the project idea over a series of extended ‘surgery’ sessions.
- That is, we try to get you to discuss your project ideas, and refine them, and improve them.
- Outputs of the unit:
 - Literature Review
 - Project Proposal
- You need to be prepared to bring your ideas (and views) and discuss each others projects, whilst trying to be constructive in your criticism.
- This helps all to develop better proposals (and ultimately projects) and also refines the skills of critique which will help in your own project.
- My role (sorry that this is naff) is largely to facilitate the sessions, but also (as an experienced researcher) to offer my views too.
- I will also bring in other researchers to provide relevant advice when appropriate.

A starter for ten

- People often change their mind (not required to believe the same things one believed a decade ago, or a year, or ..).
- As evidence arrives we change theories and models in response (gosh that sounds like science).
- Much research is flawed. To get us going:
 - I will present some of my own work, in a very general sense, (rather than criticise others – well Ok some others a bit), and then we will look for how we would construct research questions, studies etc.
 - Will examine flaws in these approaches.
- Take these ideas on to your own projects

Other issues to consider

- Who will supervise your project?
- What are their interests and expertise (and how do you find this out?).
 - Web site, recent projects, BURO
- Do you really want to do this work
- Is it interesting?
- Is it achievable (within the time)?
- What are the risks?

An example: Quality of Specifications.

- What do we mean by quality?
- For what purpose?
- What form of specifications?
- How do we support the writing of quality specifications?
- What guidelines (or support) works best?
- How do we know?

- Look at some of the work in the area...