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## Mapping Intentions

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### Abstract

*The paper describes some of the approaches being taken to explore what does happen, as opposed to what 'should' happen, when higher education students are engaged on design and technology activities. The paper explores the use of a schema, grounded in data, that is used by students as a reflective tool prior to an interview. The schema evolved from the perceived tension between design and technology as a stimulus for change in the made-world, and design and technology as a stimulus for change in the learner.*

*The primary focus of this paper is the development of the study's methodology and segments of data have been included to assist this purpose. An Appendix contains a more complete interpretation of one respondent's data.*

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### Introduction

This paper describes aspects of the current episode of an enquiry. The aim of the study is to explore *Students' perceptions of design and technology and their significance*, and the setting for the study is a BA (Hons) Design and Technology course. I have come to view the BA students, their staff, the Department and the College as a social setting, and the intentions of the course as a major, but not a solitary, set of stimuli for action in this social setting. The intention of the study is to secure a more thorough understanding of the practice of design and technology in an educational context, and the socio-political determinants of this practice. The purposes that this may eventually serve would be to improve the fostering and facilitation of capability; capability in learning and capability in designing.

### Background

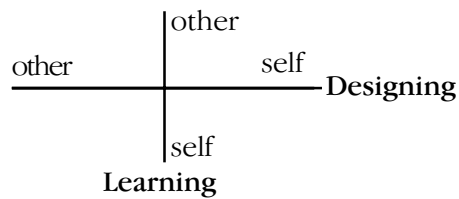
For this study, with its intention of trying to find out what students do believe and understand rather than what they think they ought to believe, a methodology within the ethnographic tradition appeared the most suitable to minimise the influence of any prescribed view of technological design.

Ethnography began as a means of studying in their natural setting, the behaviour of small communities in simpler societies. It now refers to the detailed study of small groups within any society. It has always been concerned with the minimal manipulation, disturbance or

interference by the observer of the setting and its emphasis has been on the understanding of the meanings which underlie social phenomena. Its predominant methods are observation, in-depth interviewing, biographies and the investigation of documents. Ethnography is thus predominantly concerned with the description of cultures and, rather than 'studying' people, many ethnographers would see their work to be concerned with 'learning from' people.

Fieldwork for this study has consisted of some participant observation followed by semi-structured, recorded interviews with a sample of BA Design and Technology students. My analysis of the interviews has revealed that they experience a number of conflicting intentions, in particular between design and technology as a stimulus for change in the made-world, and design and technology as a stimulus for change in themselves as learners. I commenced to use this perceived tension as an analytical tool to help reveal further understandings of the interview data. I have called this analytical tool a schema, and I employ the term to mean a model representing the structuring of generic concepts. My first schema had two dimensions, each with two domains.

Previously I had been the sole interpreter of data; the validity of my interpretations now exercised my mind.



### Validity Of Qualitative Data

Two forms of validation, triangulation and respondent validation, are frequently recommended as particularly appropriate to qualitative data. Triangulation (a term derived from land surveying) means having two or more fixed 'sightings' of a finding from different 'angles'. Triangulation characteristically depends on the convergence of data gathered by different methods, such as observation and interview, but triangulation can occur with data gathered by the same method but gathered over time, and it can also be based on different reports about the same event by two or more researchers who are studying the same phenomenon. Respondent validation means checking with participants to see if they recognise the validity of the analysis being developed.

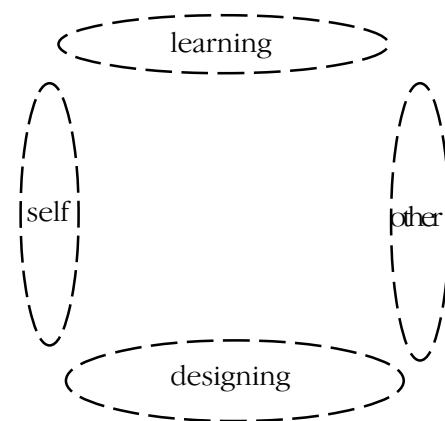
In view of the apparently subjective nature of much qualitative interpretation, validation is achieved when others, particularly the subjects of the research, recognise its authenticity. One way of doing this is for the researcher to write out his/her analysis for the subjects of the research in terms that they will understand, and then record their reactions to it.<sup>1</sup>

Initially each respondent received a copy of the transcript of a complete interview that had been separated by me into episodes that I considered significant. They also received an explanatory paper on the use of the schema, including some imaginary examples. They were then invited to apply my schema to these episodes, with the whole interview contextualising the episodes. In its baldest form this approach could be seen as me 'marking' their transcript and they validating (or not) my 'marking'. This was seen as a first stage, to be followed by respondents undertaking the separating of transcripts into significant episodes themselves and then applying the schema. A third stage was

conceived as each respondent analysing the interview(s) of other respondents.

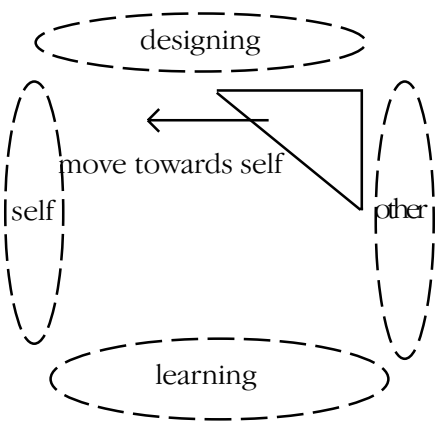
### My Present Understandings

The respondents experienced difficulties with the schema, and if an analytical tool is to be accorded that title, one needs to be reasonably confident that it can be used reliably in the vast majority of cases. The orthogonal representation implied that the dimensions of learning and designing, with the domains of self and other, were counter-opposed to form a relatively simple two-valued logic. I came to see that the underlying logic of the schema was more fuzzy than the Cartesian one implied. The schema was configured so that rather than designing and learning as orthogonal axes, they were rotated through 90 degrees to form a plane:



Whilst engaged on their final project of the third year of their course, I asked the respondents to track, using this schema, what was happening whilst on the project task, and at weekly intervals an interview was conducted. Essentially, respondents were taking snapshots of their intentions at intervals through the project, and if possible ascribing reasons for changes that they detected to these intentions. These completed schema then formed the central stimulus for the jointly constructed discourse of an interview; its function was to probe further the meanings recorded in the respondent's completed schema sheet(s).

In order to see this approach in operation, I show two schemas from one respondent. They are numbers 4 and 5 from a total set of 15. They were completed, interspersed with two interviews, over a two week period.

<p><b>Fully transcribed schema sheets and their annotations completed by respondent during the week prior to the interview.</b></p> <p>No.4 Firmly established that my project is all about getting to grips with end user and designing suitable artefact. At this stage I had disregarded objectives of woodmill.</p> 	<p><b>Sections from interview in which the schema sheets are used as a focus for discourse.</b></p> <p>So at this point I was trying to establish about the end user requirement and so to a certain extent I disregarded my Learning Objectives. I was thinking about would someone want to buy this product [...] The main thrust of my learning objectives was centred about working in the woodmill. That it had to be made of wood. Then when I started designing it I thought that wouldn't in my opinion be the most appropriate design to come up with, so I should consider the end user rather than my own requirements. I established that if I did want to learn wood working skills I could go to evening classes. I was trying to get to grips with why you design. When I first came here I decided that you sat there and designed wonderful bits of machinery or whatever from the creative side and that's an element. But if you create something that hasn't got a use, no matter how technically advanced it is, i.e. : it's the wrong shape, too big, too small, wrong colour or whatever, then to all intents and purposes it's useless, even if the technology is advanced. [...] So designing in this sense is establishing what the end user really needs and because of that I'm designing to those considerations.</p>
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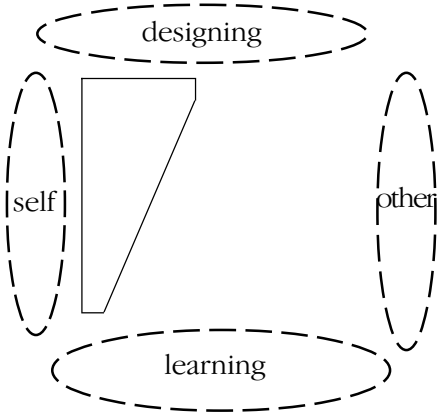
**Example of one respondent's self-tracking and subsequent interview**

[The primary focus of this paper is the development of methodology, and this segment of data has been included to assist this purpose. Appendix 1 contains my overall interpretation of the respondent's data for this project.]

My current approach to respondent validation is that I analyse the data from the previous interview and the respondent receives my written interpretation prior to the next interview. The first stage of an interview is an invitation to the respondent to comment on this interpretation and to pursue any questions either of us have arising from it. This is followed by the focus shifting to the respondent's current design and technology activity. Consequently at an interview respondents have available to them:

- Previous interview: their schemas, full transcript of that interview, my interpretation of it.
- Current interview: their schemas.

I have come to realise that it is necessary to avoid becoming locked into a continuing cycle of detailed commentary, analysis and redesign of the schema. The schema may not be fully fashioned, nor complete nor appropriate for all possible events and individual respondents, but it is successful if, as the result of applying it, it achieves its function. What is its purpose? The schema is a prompt for the respondent's use prior to the interview. This prompt allows a meta-level of discussion in the interview and thus the intention of the schema is to unlock the respondent's meanings to him/herself. How the respondent specifically uses the schema is not central to this study. It may be that for some respondents there is a minimal need for this prompt for a meta-level of discussion in her/his interview. The schema is 'working' if meta-meanings emerge in the interview. It should be my interpretations that

<p>5 End user considered but my own needs/wants considered</p> 	<p>What then happened was I justified to myself that there's a role for this piece of furniture to play. I've got to go about making it. What I want at this stage is something I'm going to find exciting because I've got to make the thing. So in effect we can step back from 'OK a sofa bed would be a good idea' and say 'What would I like?' because I'm going to make it. [...] So that is why the thing flips over like a mirror image almost and so it becomes all Self in the design.</p> <p>Interviewer And the reason for that to flip over like this, you wanted it to be exciting and interesting?</p> <p>Yes, for myself.</p> <p>When you say for yourself, do you mean for you to use or you to actually make?</p> <p>I guess it's a bit of both. [...]. So at that point I was thinking 'What colours do I find exciting?'</p> <p>Interviewer So in that respect, the end user now has faded away in a sense and your needs or feelings come more into play?</p> <p>Yes. [...]. Obviously if I were working on a project in a professional aspect this stage probably wouldn't arise, because when it came to making it I could say 'Well I personally think it would be quite nice if it was black' You'd carry on this idea but go on to the end user needs for colour, texture, feel, etc. [...] I went on to look at the things I prefer because I'm the guy who's going to make it and obviously I'm self-funding, so I have a vested interest in an industrial or professional capacity. So I was now flipping between the two.</p>
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are validated by the respondents, not the means to that interpretation.

### Summary

Respondents have found the later version of the schema much less constraining in many ways; allowing them more freedom to map their intentions, and changes in these intentions. However, I would see the major advance to be the shift in locus of involvement and responsibility from researcher to respondent. They now have ownership of the schema; it is their tool for their use. At an earlier stage of the research, I asked questions and respondents' involvement was in giving answers to those questions, however 'semi-structured' those questions might be. Respondents are now using the schema as a reflective tool for themselves and their words and diagrams are then a stimulus for conversations with me. The object of these conversations is to explore in more detail what is happening for them whilst

on a design and technology course in higher education. These insights are contributing to the aims of the study.

Throughout the process the aspiration has been to be consonant with an ethnographic methodology in allowing the meanings that students are making of design and technology to emerge. I attempt to untangle, from these and other sources, the threads of meaning: their needs and wants, their fears and frustrations, what helps and what hinders. There appears to be a whole galaxy of factors operating in a highly complex arena, and certainly not just the 'requirements for action' that are defined in the mantras that are in the literature.

### References

- 1 McCormick, R and James, M *Curriculum evaluation in schools*. Croom Helm, Beckenham (1983) p 191

## APPENDIX 1

## RESPONDENT VALIDATION: VIV CROSS

Intentions of this paper:

To convey to my respondent Viv Cross my interpretation of data. This data consist of

- schema sheets completed by Viv prior to:
- two recorded interviews in which these schema sheets were discussed

I am interested in Viv's observations and responses to my interpretation of the data. His observations and responses will form part of the focus of an interview in the first part of Lent term 1995.

Reference to transcript is made as date/line commencing i.e. 10/9 is 10 June/line 9

At the outset of the project Viv has to propose a design brief through which he must act. In theory there are a very large number of possibilities for him to choose from. What are initially his intentions? A section from his project proposal articulates one focus of intentions:

### Background

This project owes its origins with my Personal Project [earlier in the course]. My investigations opened up an interest in furniture design with a particular leaning towards the bedsit scenario. An interest which I found difficult to put down. I hope to use this enthusiasm and theme in this project.

### Brief

Design a piece of furniture which could be used in a one-bedroom/studio flat. [...].

He has also identified in the project proposal a set of learning objectives including:

- To gain experience of the wood and metal shops, and become more confident on wood-mill plant. This is an important element as I wish to combat my fear of this machinery.
- Research - to investigate the thinking and influences behind furniture design [...]
- To design and create a quality product, planned and fabricated in a designerly manner.

The interview gives further insights into these; the desire for pleasure,

Viv has a particular intention associated with woodworking skills. This particular intention is resolved by a strategic decision by Viv and so then I paid a lot of attention to the third party and the design side. When I finished I thought 'Fine, this is great, but I'm not going to use so much of the wood mill'. . . , but I guess what I was thinking of was that if I'm lacking a skill in woodwork, if I had to I could go and sign on at evening class down at the college in Bournemouth and learn how to use the planer, so that wouldn't be a major problem for me. Whereas trying to understand what this design, giving consideration to the third party, just trying to make certain that it could be built for the consumer industry, that at the moment is something that I want to get my head round. So I guess I am learning, but my original objectives of wanting to use to planer thickness, router, various bits and pieces, that has taken a second place. . .10/81 Obviously we're on a design and technology course, not a woodwork degree. 10/104

This conflict causes him to continue to ask himself questions:

The main thrust of my work was centred about this idea of my learning objectives from working in the woodmill. That it had to be made of wood. Then when I started designing it I thought that wouldn't in my opinion be the most appropriate design to come up with, so I should consider the end user rather than my own requirements. I established that if I did want to learn wood working skills I could go to evening classes. I was trying to get to grips with why you design. 27/13

His intentions, with their emphasis on the needs of the end user, undergo another discontinuity when they are redirected to his own needs and wants. This redirection is caused by the onset of the making of the artefact.

What I want at this stage is something I'm going to find exciting because I've got to make the thing. . . 'What would I like?' because I'm going to make it 27/34

I was designing it from my own viewpoint rather than for the end user.

Interviewer: When you say for yourself, do

you mean for you to use or you to actually make?

I guess it's a bit of both. Just thinking about colour scheme, for the length of project, and as it happens I didn't, say do a market research on what colour schemes people find attractive in furniture. [...] So at that point I was thinking 'What colours do I find exciting?' 27/41

Some possible explanations for this. For Viv, I am now going to make this (intention) thus it needs to satisfy my intentions. Why? It's going to cost Viv money and time. It's going to have a longevity; be with him for a long time - as he makes it in the workshop and when it is finished. The tangibility of the artefact (a real thing in the world), the tangibility of blood sweat and tears, causes the mythical end user to be replaced with these very emotive, immediate, feelings of the soon-to-be maker: I went on to look at the things I prefer because I'm the guy who's going to make it and obviously I'm self-funding, so I have a vested interest. 27/63

The criterion used in the making stage, for example the adoption of a particular process, is not solely connected with tangibility of the artefact, but also on trying things out for the first time - Viv is still concerned with learning: there might be a particular finish on the metal, like chrome or something. I'd never chromed anything so I would chrome it just to see what the processes were that were involved. 27/63

## Summary

Viv reflected on previous outcomes of his work, in particular his weaknesses. In part he was prompted to do this by the nature of the project brief. He viewed his design and technology activity as means to learn for himself. The specific intentions to achieve this were identified by him, and they were influenced strongly by pleasure and material manipulating skills. These intentions led to his brief.

From reflection on previous work, his intentions were directed toward the needs of potential end users of his artefact. However, once the making phase became closer and more immediate for him, this concern for the more general case of any end user was replaced with a concern that this artefact satisfied him - both in the final form and the means of getting there (i.e. in its making). Concern for financial and psychological cost to him, and sufficient time to finish the artefact all contribute to directing all his intentions back to himself.

I am particularly interested in what can be learned from the discontinuities in intentions. My interpretation is that the first one is when the needs of the user are recognised and the second at the onset of making.

Overall Viv, does this interpretation feel right for you?