'You need to research your subject so you know the subject well, and your users so you know what they need'. Teaching graphic design using information design principles

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teaching,
information design,
graphic design,
user-centred,
audience

Set against a background of graphic design's 'identity crisis', this paper proposes that information design can provide an adaptable and relevant framework for teaching graphic design. With social, technological, environmental, and industrial changes providing a new context for design and how it operates in the world, an audience-focussed, problem-solving approach is validated as central to reimagining graphic design education. Through a case study example, the paper suggests that when graphic design students in a traditional craft-based design education programme are offered a human-centred approach to solving design problems – specifically information design problem solving and research methods – their own graphic design practice changes.

1 Introduction

> 'For in showing students new areas of engagement, we may set up alternative patterns of thinking about design problems. We may help them to develop the kind of social and moral responsibility that is needed in design' (PAPANEK, 1974: 64).

This call to action still resonates today, as the 'real world' that designers engage with faces social and environmental challenges that even the visionary Papanek could not imagine. The way that designers begin to think about design problems – what they are and how to solve them – finds its natural place in tertiary design education. In graphic design education, the school's philosophy and conception of graphic design's purpose and its role directs course content and curriculum. It creates a particular culture of teaching and practice. This can be a culture that's outward looking, multidisciplinary, and human-centric. Or it can be a self-oriented, craft-based design culture that's more concerned with designing for designers than with meeting ordinary people's needs, or improving 'real world' situations. Graphic design's established identity is breaking down as design discipline boundaries blur, and a focus on human experience and needs rather than the production of artefacts comes to the fore. If it is to keep

up, tertiary graphic design education must reposition its frames of reference and adopt more human-centred goals.

This paper offers a way to access these 'alternative patterns of thinking'. It proposes that introducing core information design principles to students enrolled in a graphic design course has a transformative effect on their design practice and mindset. Using a case study example, I suggest that when graphic design students in a traditional 'craft-based' programme are presented with an information design-based approach to solving design problems, their attitude towards their graphic design practice shifts to incorporate more human-centric values. And by adjusting the framework and the lens through which design students regard visual communication design, a more relevant and progressive discipline identity is promoted.

2 Graphic design in transition

What's in a name? Plenty, according to the world body on professional communication design Icograda. Formerly known as International Council of Graphic Design Associations, the Council changed its name in 2007 to International Council of Communication Design, removing the reference to 'Graphic' in its descriptor while retaining its identifier to respect the Council's history (ICOGRADA, 2011). In the Icograda website's revised definition of the profession, graphic design is a subset of communication design, on par with practices such as typography, calligraphy, packaging design, and advertising. It is no longer the 'umbrella' term under which such activities sit. For Icograda, the term communication design reflects a more strategic practice that enables communication goals, not just the realisation of visual artefacts (ICOGRADA, 2007). At the 'grassroots' level, graphic design's identity has been in flux; its status as a discipline, its nomenclature, and what defines its processes and practices are subjects for debate amongst its community (ICOGRADA, 2005). Not all designers feel that the nomenclature graphic design describes what it is that they do, or the design solutions they create. They argue that 'graphic' denotes pictures and images, and doesn't account for the conceptual, strategic, textual, aural, experiential or immersive aspects of designing communications (BUSSE, 2010). In line with its name change, Icograda has called for graphic design education to respond to the changing environment by meeting industry demands, while pushing past established discipline boundaries (ICOGRADA, 2005). The stage for a reconsideration of graphic design teaching has been set.

3 Views on graphic design education

A tertiary student who embarks on a course of study in design will be steered towards broad silos of practice, depending on their

interests and aptitude. Those students who prefer to work with communicating ideas and information will most likely enrol in a programme variously called graphic design, communication design, or visual communication. In tertiary design courses, information design is frequently regarded as a specialism, a subset of a more 'primary' design discipline like graphic or communication design (Design Council, para. 6). As a course of study, information design tends to be offered as either an adjunct to, or part of a graphic/communication design programme (like Swinburne University); or as a stand alone, specialist course, either contextual or skills-based (e.g. Reading University, Carnegie Mellon University, CPIT). Information design courses have in common a core precept of human-centred design.

By contrast, graphic design courses vary in their teaching approach. The culture of a graphic design course emerges from tradition (institutional and discipline-specific history), where its curriculum and teaching methods are influenced to some degree by industry demands. The underlying philosophy of any design course; whether this is craft, sustainability and human-centred design, or reflective personal practice, permeates the teaching approach of the course on many levels; from the choice of teaching staff to methods and tools. This philosophy, which is either progressive or regressive in terms of its relevance to industry, embeds itself in the culture of a course. Like standing in a mirrored room, this can create a kind of design solipsism that's hard to escape from. One of the approaches found in graphic design teaching, which Schriver (1997: 56) calls 'the romantic tradition' is individualistic and intuition-based. Discovering one's personal 'voice' is the aim. Here, notions of audience and communication goals are rejected in favour of self-expression. All content areas that students encounter in the 'romantic' teaching culture, including information design projects are also subject to a bias towards personal style, expression, and creativity. They don't admit audience-centric communication goals, since process and outcomes are assessed on entry-level problem solving skills. As a result, what McCoy (2003: 7) calls 'the detachment problem' is promoted, where students perceive that 'graphic form is something separate and unrelated to subjective values or even ideas'. Graphics are seen as a 'language' but one that is taught in an abstract and conventional way, devoid of rhetorical, semiotic, or cultural references. Left unchecked and unexamined, this leads to a disconnection from reality that is carried from academia into professional practice.

Discourse about design education recommends a paradigm shift in the way we teach design. Proponents of educational change agree that traditional design activities are adapting to a changed world, where design is increasingly interdisciplinary, problems are more complex, and where the 'outputs' of design are interactions and experiences for people, rather than artefacts (DAVIS, 2012; FRASCARA & NOËL, 2012; NORMAN, 2010). These commentators suggest that current design education is 'mired in the past' (NORMAN, 2011: para 2). Many design

schools are caught up in a 'twentieth-century, craft-based model of design education' (DAVIS, 2012: 114) where design educators inculcate students in a 'romantic and heroic' vision of design (SLESS, 2012: 64). Frascara and Noël (2012) claim that human-centred, evidence-based, and responsive design can instil important social values and a strong sense of civic identity in design students. And they suggest it is this that marks out a professional education of real value, rather than imitative, skills-based instruction.

In relation to the above context, the following section discusses the process and results of a design project assigned in 2013 to undergraduate students in the Graphic Design major at AUT University, Auckland, New Zealand.

4 Case study: procedural instruction design assignment

4.1 Background

AUT University's Bachelor of Design students complete three years' study in studio-based and theoretical areas. The programme allows for increased specialisation as students build their technical knowledge and skills, while developing a contextual base of design theories and processes.

Studio classes in the Graphic Design major involve a wide range of projects that cover many disciplines and design practices, from interaction design to letterpress printing. The reasoning here was that by giving students a 'taste' of many graphic design-related areas they might subsequently focus on those parts of the field that suited their skills and interests. This lack of specialism in the course comes partly from the programme's polytechnic past, and partly from the (inaccurate) perception that when it comes to vocational skills, New Zealand designers should be 'jacks of all trades', and that this is an advantage on the international job market.

Information design assignments were formally introduced in 2010 because information design was not represented in any of the course curricula. An obvious choice – if not the typical entry point for teaching students about working with complex information – was data visualisation. The Year One information design brief set out to discover new ways of presenting complex data, where information graphics formed the basis for the information display in poster form. The task in the Year Three brief was to design a data map to chart variables of a dynamic event (such as sport scores or weather patterns), with an aim of developing a 'visual language' through working with the information's 'internal system logic'. Like all of the other briefs taught in the Graphic Design major at that time, neither the concept of audience nor user-based problem solving were taken into consideration. This was in line with the Department's 'romantic tradition' of design teaching.

4.2 'How to' procedural instruction design assignment – development of the brief

The last year of the undergraduate degree is somewhat late to be introducing students to human-centred design principles. Nevertheless, in keeping with the programme's diverse content and the need to respond to a distinct gap in tertiary graphic design curricula, I taught a Year Three student brief with a user-centred focus. Here, an information artifact that did not work for its audience had to be redesigned to better meet its audience's specific needs. This entailed an emphasis on usability, defined for this brief as 'the ability of an object or system to be used with satisfaction by the people in the environment and context the object or system is intended for' (LIPTON, 2007: 37). Usability as a study and practice is closely tied to web and interactive design. When applied to graphic design, user-centred design can be limited to functionalist, rule-based precepts of user-testing and design efficacy. The purpose of this student assignment was to extend the limiting conception of user-centred design as being solely about de-personalised 'users'. It aimed to promote an awareness of socially responsible design and the potential for effecting social change (BENNETT, 2012).

I decided that the redesign of an existing information artifact would provide the best learning outcomes for students. This involved a real-world design problem, 'working with a real client and listening to real audiences' (FRASCARA & NOËL, 2012: 45). As a starting point, I chose to adapt an information design project that Judith Moldenhauer (2002/2003) assigned to graphic design students at Wayne State University, which she then discussed as a case study.

One of Moldenhauer's goals was to counter her students' perception that information is dry, boring, and impersonal. Students were encouraged to use storytelling to recount their own experience of their encounter with three different information artefacts (a form, a map, and a set of instructions). Two stories were told simultaneously, one of the students' experiences of using the information, and the other of the information itself, its meaning and purpose. Their analyses of these stories were used to inform and frame the redesign to become a more accessible and personal information artefact in each instance.

In contrast with Moldenhauer's approach, the information design assignment for my Year Three class drew upon both their personal experience of the information artefact and other people's experience of the same information. With a five-week teaching timeframe, and working with students who were new to concepts of user-centred design, this assignment focussed on one information artefact only; a set of procedural instructions. My Year Three class of 17 students each chose an object or service that came with a set of confusing procedural or 'how-to' instructions – ones that failed to clearly communicate their objective. The individualisation of each set of

problems and their diverse audiences increased student engagement with their own and with others' redesign. Students analysed the graphical and written tone, layout, navigation, typography, and presence/absence of information in their chosen instructions. They used an iterative design process that involved:

- understanding the users' needs and defining the problem;
- collecting the information to help solve the problem;
- exploring a range of ways to solve the problem;
- testing and revising to evolve an improved version of the original instructions.

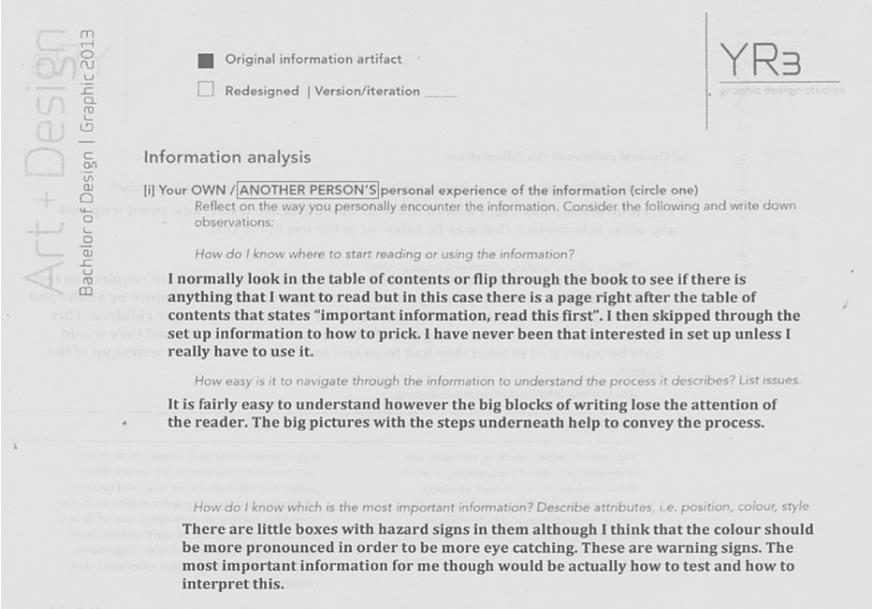
Students also considered the appropriateness of their design aesthetic and medium, according to the audience and the information's communication aims. And while aesthetics still played an important role as the interface between the design and its audience (FRASCARA & NOËL, 2012), cosmetic aspects and the students' personal likes and dislikes were downplayed in this assignment.

4.3 'How to' procedural instruction design assignment – students' design and research methods

These students' sole exposure to information design practice before the procedural instruction design brief was the Year One visualisation poster project previously mentioned. Thus, all of the data-gathering and analysis methods in this human-centred design project were new to them.

A key data collection method was an information analysis form. I supplied this to students for them to use at several formative stages in their design process. Their first task was to review the original set of 'flawed' instructions and make their own analysis. They were then asked to give the original instructions and the analysis forms to at least five people in their target audience. Participants were to complete the form after studying the instructions (refer Figure 1). One student, Van, who redesigned a section of a Tae Kwon-Do manual reflects on his information analysis of the original manual completed by two audience members; white belt Tae Kwon-Do trainees: 'Interestingly in all the cases people knew where to look and how to read the information but the information lacked clarity and was too hard to understand even when using simple terms. Instruction meant nothing when you cannot see or imagine what to do'.

The same information analysis form template was used again with audience members to test both further design iterations and the final redesigned procedural instructions, acting as 'checkpoints' along the way. Each time the results were analysed and re-scoped into the next design phase.



Art + Design
Bachelor of Design | Graphic 2013

Original information artifact
Redesigned | Version/iteration ____

YR3
graphic design studies

Information analysis

[i] Your OWN / ANOTHER PERSON'S personal experience of the information (circle one)
Reflect on the way you personally encounter the information. Consider the following and write down observations:

How do I know where to start reading or using the information?

I normally look in the table of contents or flip through the book to see if there is anything that I want to read but in this case there is a page right after the table of contents that states "important information, read this first". I then skipped through the set up information to how to prick. I have never been that interested in set up unless I really have to use it.

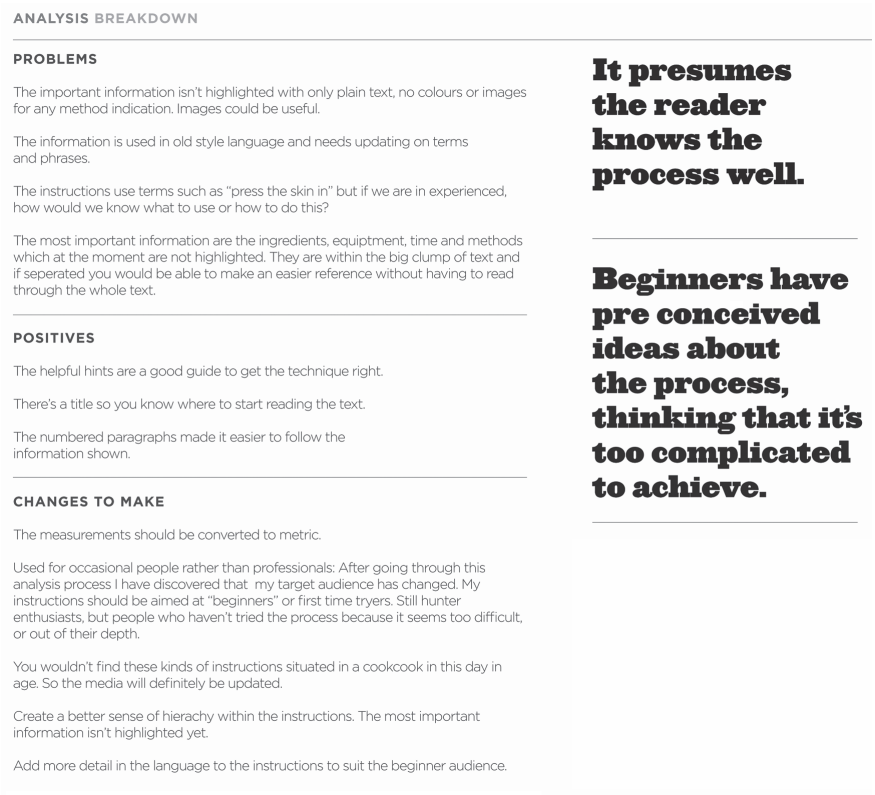
How easy is it to navigate through the information to understand the process it describes? List issues.

It is fairly easy to understand however the big blocks of writing lose the attention of the reader. The big pictures with the steps underneath help to convey the process.

How do I know which is the most important information? Describe attributes, i.e. position, colour, style

There are little boxes with hazard signs in them although I think that the colour should be more pronounced in order to be more eye catching. These are warning signs. The most important information for me though would be actually how to test and how to interpret this.

Figure 1 Excerpt from a completed information analysis on the original information (a manual showing how to use a blood glucose monitor). A person who has diabetes type 1 completed the form (used with permission of Chloë Litchfield)



ANALYSIS BREAKDOWN

PROBLEMS

The important information isn't highlighted with only plain text, no colours or images for any method indication. Images could be useful.

The information is used in old style language and needs updating on terms and phrases.

The instructions use terms such as "press the skin in" but if we are in experienced, how would we know what to use or how to do this?

The most important information are the ingredients, equiptment, time and methods which at the moment are not highlighted. They are within the big clump of text and if seperated you would be able to make an easier reference without having to read through the whole text.

POSITIVES

The helpful hints are a good guide to get the technique right.

There's a title so you know where to start reading the text.

The numbered paragraphs made it easier to follow the information shown.

CHANGES TO MAKE

The measurements should be converted to metric.

Used for occasional people rather than professionals: After going through this analysis process I have discovered that my target audience has changed. My instructions should be aimed at "beginners" or first time tryers. Still hunter enthusiasts, but people who haven't tried the process because it seems too difficult, or out of their depth.

You wouldn't find these kinds of instructions situated in a cookcook in this day in age. So the media will definitely be updated.

Create a better sense of hierachy within the instructions. The most important information isn't highlighted yet.

Add more detail in the language to the instructions to suit the beginner audience.

It presumes the reader knows the process well.

Beginners have pre conceived ideas about the process, thinking that it's too complicated to achieve.

Figure 2 Example of results from information analysis (used with permission of Phoebe Ellis)

Phoebe chose to redesign instructions for curing animal hides at home. She had no experience of curing or tanning hides, and had no personal connection with anybody who had expertise in this process. Phoebe made contact with experienced local hunters who were willing to complete the information analyses and correspond with her via e-mail and phone. Her first information analysis indicated that she should focus on a different user group than she had originally imagined – novice-but-keen hunters, rather than experienced ones. Phoebe had initially made assumptions about the target audience needing to be 'expert' hunters. This was mainly due to her knowing little about hunting culture or the process of curing hides, but might have continued unchecked without some basic primary research. The repositioning of her user group drove design decisions through all stages of her project including selecting and editing textual content from original sources, the format (pocketbook) and chosen design aesthetics (refer Figure 3).

Figure 3 Final design of Tricks to Tan pocketbook manual (used with permission of Phoebe Ellis)

Depending on their choice of procedural instructions to redesign, students were able to work alongside stakeholders and make a positive difference to a social situation through design. Chloë's chosen procedural instruction artefact was a step-by-step booklet that described the use of a blood glucose monitor for diabetics. E-mail correspondence with Diabetic Youth Auckland gave her statistics about the numbers and ages of people in New Zealand with diabetes type 1. This knowledge, along with her friendship with a young woman who had been diagnosed as diabetic at the age of eight meant that Chloë opted to design blood glucose testing instructions specifically for children between the ages of six and 12 years who are newly diagnosed with diabetes type 1. The instructions needed to engage and inform users, while making the process of finger-pricking less intimidating for young patients.

After proposing an innovative pinwheel design, Chloë used paper prototypes to iteratively test her concepts. Her user groups were consulted each time for feedback. Diabetic Youth Auckland suggested further testing Chloë's design with a view to putting the pinwheel into production.

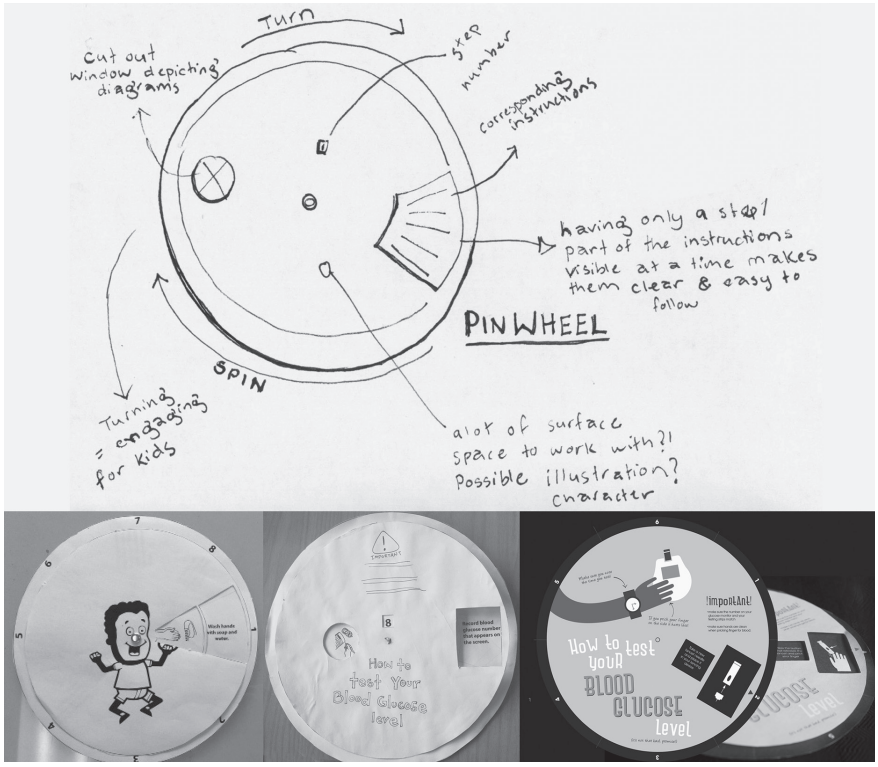


Figure 4 Sketch, two prototypes, and final mock-up of How to test your blood glucose level pinwheel (used with permission of Chloë Litchfield)

5 Researching student perceptions

5.1 Student perceptions of their experience

Towards the end of the procedural instruction design assignment, students were confident and proud of what they were producing. They regarded their work as important, not just for their design portfolios but also as mechanisms for social change; as Herbert Simon (1996: 111) suggests when talking about design's purpose, 'changing existing situations into preferred ones'. The assignment's levels of applied research and analysis encouraged students to become 'experts' in their subjects, because they needed to understand the service or area, as well as the users of the information (HELLER, 2006). The explanations of their design journey in their process work suggested that they had embraced many of the assignment's research methods. They also

talked about it positively; how it made information design less boring and gave them practical tools for further application. I wondered how this particular assignment had informed my students' views of their future graphic design practice?

Following the completion of this information design project, I wanted to discover the students' perceptions of what was for them, a wholly new design approach. Of particular interest in the study was what students had taken from this project, and what they'd learned in relation to their ongoing graphic design practice. Data was gathered wholly by anonymous questionnaires, rather than through focus groups. Small class sizes meant that students knew each other well, both in class and through online social networking, and I felt that this collegial dynamic could affect a focus group discussion. The data for this early stage of the research needed to be broad in scope, and provide the 'insider view' of students' perceptions and experiences (MASON, 2002). I therefore used a qualitative, open-ended questionnaire delivered online to ensure anonymity and convenience for participants.

5.1.1 Initial scoping

Directly after they had completed their procedural instruction design project, I asked my Year 3 students one question: '*What is the ONE main thing you've learned through this information design project that you can apply to your current design approach, or that will influence the rest of your design practice? Explain*'.

Below are the collated responses (total respondents 10):

> '*... if the user can't understand the steps, no matter how good it looks, it is a failed design.*'
> '*You need to research your subject so you know the subject well, and your users so you know what they need. This skill I have learned will definitely influence my design approach to other projects and tasks.*'
> '*I've learned how to communicate with audiences – people! I had realised that there is a big gap between designer and audience and tried to solve problems.*'
> '*The main thing I've learned through this information design project is to correctly pick up the important information from the rest of the content, and redesign/simplify the diagram to help the reader more easily understand the instructions.*'
> '*I have learned through some research books that viewers aren't us, and they need things explained to them in more than just black and white.*'
> '*The importance of the target audience understanding the design. If people do not understand a piece of graphic design, it is pointless.*

> *Surveys, personas, and target market research have been very important in my process.'*
> *'Logical problem solving in relation to the thought process of the consumer.'*
> *'That I always need to test my design on my intended audience. Repetitively.'*
> *'Analysis – evaluating what's not working and why. Also methodically thinking in steps; not just for instructions but also how to go about improving the problem/s.'*
> *'I have learnt that research is immersing yourself, and learning about the subject matter helps in better design. Before I would just get in and design but now I hold back and do more work in research (80%) and 20% design.'*

Key themes here are analysis, testing, research, problem solving, audience, and understanding.

5.1.2 *Second stage data collection*

Ten weeks later, I invited students to complete another online questionnaire. What I wanted to understand at this stage was whether their learning experience in the procedural instruction design project had affected their process or design methods in their other design projects. I also wanted to see how they conceived graphic/communication design.

Students were asked to define 'graphic design', 'communication design', and 'socially responsible design'. In the terminology they used, students indicated that they perceived these differently. Definitions for graphic design included 'a creative process', 'commercial art', and 'visual language'. Communication design was defined as 'sending messages' and 'communicating', and suggested the involvement of people in the communication process ('target audiences' and 'people'). Both graphic design and communication design identified 'communicating' as a key aspect, however in defining communication design the focus was less on transmitting and more on 'understanding'. With definitions for socially responsible design, the results were more clear-cut. Six out of seven definitions focussed on the notion of design impacting positively on society, and design with a conscience.

The online questionnaire asked students to think back to a key design project from their previous year's study, and to list the design stages they undertook in the order they remember doing them. They were then asked to recall in order the stages they remember completing in the last design project they worked on (which for most was the self-directed graphic design assignment that followed the procedural instructional design brief).

There were differences between the design stages recalled before and after completing the procedural instruction design assignment.

'Research' was listed iteratively throughout the second assignment stages for four out of seven respondents. For stages in their past assignment it only appeared at the start of the process if noted at all. The design process stages appeared more complex and there was more analysis noted throughout the second assignment. Three participants mentioned the inclusion of audience viewpoints as part of the design process. In the assignment they recalled the previous year, class critiques were the only means of gauging an external viewpoints.

Table 1 Sample of student responses when asked to list design stages from assignments completed in 2012 and 2013

Respondent	Graphic design assignment: Term two, 2012	Graphic design assignment: Term two, 2013
Student A	Brainstorming. Trawling internet for images (image references and research). Pulling images in to create an identity. "Storyboarding" to plan order for content. Prototyping. Critiques. Development. Print prototypes. Printing.	Book/Internet research. Brainstorming. Image research/ reference. Public surveys. Design material out of survey results. Analysis of outcomes. More surveys and analysis. Collate all information. Design solution.
Student B	Shop Identity design: Exploring and finding artefacts from the shop. Using these artefacts to create artistic imagery. Simplify this imagery to create a logo. Do two versions of the logo on stationery. Refine the stationery. Final submission.	Researched a broad topic. Highlighted all the information I found interesting. Find common topics I was drawn to, e.g. design in life. Explored more in this topic. Came up with a list of problems to solve. Write a proposal for my project. More research. Chose a picture that was the essence of my topic. Do testing. Do further testing. Decide on my final project. Experimented with logo forms. Designed final logo. Designed blog. Got surveys done about my blog. Final outcome. Reflection.

5.2 Summary

At this stage of the research, the data collection and analysis has been aimed at gathering broad insights into student perceptions of an area of design engagement that was new to them. This study indicates that an approach to graphic design education based on precepts from information design can inspire students to be more socially responsible, critical, empathic, and research-led in their graphic design practice. They are better informed about the subject they are working with, and more aware of the needs of the people they are designing for. The study suggests that when students adopt a

conception of design that's less subjective and more evidence-based, this permeates their practice in general, and informs their design outlook and approach.

6 Conclusion

Information design brings clarity and comprehension to visual information. Its purpose is essentially altruistic – it aims to help people to understand, access and use explanatory and instructive material. Its established user-centric principles can provide an adaptable framework for reimagining a more relevant and integrated curriculum for any design course that prepares designers for communicating ideas and information.

Because procedural instruction design involves problem-finding, and then improving an existing information artefact through user-testing and analysis of evidence, it was a useful learning activity for students whose sole prior introduction to information design was an assignment which required them to create a system for visualising abstract data. A successful piece of information design isn't developed from abstract ideas; it must be accessible to the people who use the information. The information design brief discussed in this paper required students to identify with their own and others' experience of using the instructions to complete a task. Thus, it harnessed 'real-world' problem solving, giving the task relevance while promoting learning in a way that isn't possible using task-oriented activities (MERRILL, 2002).

A graphic design course curriculum could incorporate audience-focussed design approaches without direct reference to information design projects. However, since a human-centric approach to professional information design is already established as an industry norm, I propose that information design principles and approaches might provide a framework for graphic design teaching and learning. In defining information design Lipton (2007: 5) suggests that 'effective information design shifts the focus from what we want to say to what the audience wants and needs, and how the audience wants and needs it'. This renewed focus might position the paradigm shift needed for any teaching that involves visual communication.

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