Teaching design research in the studio

Design education is diversifying as it responds both to the needs of industry, and to the long-standing demands for design (as a discipline) to take its place as a legitimate academic field in its own right. In this paper we describe an attempt to integrate design research into a studio-based design education by giving students the opportunity to analyse data collected during their own projects. In the three-week project, students were given short courses in research methods and analysis, and an initial research question to frame their inquiry. Each group of students produced a short research paper as their deliverable for the project. We evaluate the success of this endeavour through four lenses: (a) as a means of enabling students to reflect on their own design practice, (b) as an attempt to teach design students research skills, (c) as a way of facilitating contributions to design research, and (d) as a means of introducing students to the academic community of practice. We conclude with reflections about how this can inform our own and others' educational practice.

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INTRODUCTION

Design research has spent most of its relatively short history trying to establish itself as a bona fide academic discipline without severing its rich, practice-based heritage. The tensions encountered in attempting to forge firmer ('rigorous') foundations for design practice are evident from the earliest monographs [e.g. 1, 19, 20], and form the subject of more recent historical accounts [6] of the field's journey. Design research has long had a turbulent relationship with science (or its idealisations), and an indifferent, if not turbulent, relationship with industrial practice [7].

However, in many ways, the arena in which these issues see their sharpest confrontation is neither research nor practice, but *education*. University design educators must both prepare students for practice and ensure students can produce (largely written) work of sufficient academic rigour to merit the academic qualification they are earning. This issue becomes of central importance in the offering of Masters degrees in design, which have typically sat uncomfortably between schools of practice and academic institutions. It is particularly in this case where students are expected to master innovative design methods *and* be equipped to undertake a PhD upon successful completion of the degree. In spite of Herbert Simon's bold ambitions, design is not quickly becoming a 'science of the artificial', nor are his aims of establishing design education on 'a body of intellectually tough, analytic, partly formalizable, partly empirical, teachable doctrine about the design process' [20, p.132] yet realised. Indeed, animated debate is still being waged over the degree to which such aims will ever be realisable in practice.

This discussion is particularly topical in light of the current quest (in Denmark and elsewhere) to elevate traditional design schools to inclusion in university academies. This program brings with it new tensions, as it directly addresses the composition of potentially rival curricula (e.g. 'traditional' and 'academic'). The possible integration of theoretical concepts (e.g. affordance, reflective practice, bricolage, wicked problem, pattern language etc.) and 'scholarly' skills (e.g. methods of inquiry and analysis, critical and self-critical thinking, written argumentation, etc.) with more traditional content of practice-based design education (e.g. design methods, studio-based teaching, design 'critiques', tools of generation and abstraction, prototyping techniques, aesthetics, visualisation etc.) offers incredible promise, yet not without introducing problems of its own.

Such promise is symbiotic. For design schools, this allegiance is undoubtedly valuable. Academic research and theoretical concepts have made available to designers a set of sensibilities that can hone their sensitivity to vital aspects of design practice, the everyday and work practices that designers seek to support with products and systems, the circumstantial actualities of products-in-use. And this is not to mention the advances in relevant technologies (computer science, manufacturing, materials science etc.) that have been the product of the academy and integral to design practice (to the point of determining, among other things, designers' design media).

At the same time, academia has equally much to gain from its integration with design schools. While there is little doubt of the utility of the intellectual advances enumerated above, there is as little doubt about their *insufficiency* as design skills. While they are obviously helpful, students (and academics) who wield such concepts with discursive/analytical skill do not automatically make good designers. Indeed, it is easy to imagine one who is adept in most, if not all, academic respects and remains a thoroughly uninspiring designer. It is not difficult to argue that design schools have generally fared much better at producing graduates whose competencies are more in line with what is called to mind with the title 'designer'. Thus, the academy stands to gain much from close collaboration with the educational practices of design schools, both in its efforts to train skilled designers, and also for academics keen to investigate what is usually referred to under the heading 'design research' – the study of design activity. In particular, the study of students' design activity can not only be informative of designing, but also to questions foundational to the work of theorists such as Simon and Schön, such as "What should design education *be*?"

But for practical reasons, attempting to achieve a seamless integration between the curricula of academies and design schools is likely to be problematic without the considerable adjustment of each. Academic subjects often sit awkwardly alongside the intensity of studio design projects, and, in our experience at least, students have felt that running such dissimilar projects concurrently has adversely affected the quality of their work in both areas.

Clearly, if there is to be some middle ground reached, it will require the integration of academic skills into a studio-based curriculum in a way that contributes to the students' enculturation into professional design practice, rather than being a distraction from it.

In this paper, we describe an effort to address some of these issues in a Master of Design curriculum. Specifically, we detail a short course in which design students conducted design research, where they analysed data gathered during their own (recently completed) design projects.

We had a number of motivations in introducing such a course. To begin with, few students in design courses are equipped (within the design degree itself) to write work of the quality expected of a Masters thesis; and yet, an institutional requirement of most Masters degrees (irrespective of discipline) is a graduate thesis. In some analytical or content-based degree programs this may not be a situation of particular concern. But in design degrees where students build a portfolio of design projects that demonstrate design ability, skills in written communication, argumentation, the use of concepts as tools to underline distinctions and construct an argument, etc. are often neglected. Thus, it was our view that a course in design research would be a way to strengthen the written, analytical, thesis-like competences in design students, prior to their commencement of thesis work.

Furthermore, it is our contention that generic research abilities (such as marshalling evidence, argumentation, conceptual clarity, analysis, inquiry, imagination, pattern recognition, communication, problem reframing) are skills that are also required of good designers. As such, this afforded an opportunity to build 'design' skills through the setting of a research project. Many design students experience design research in the abstract (as in theory courses), or, if they do get first hand experience of research, it is often as the subjects of design research, rather than as the researchers themselves. In contrast to this, we wanted to introduce students to design research through first hand experience of *doing* research.

Additionally we have taken seriously Schön's notion of designing as a reflective conversation with design situations; this is one that not just underlines our educational practice, but also our forays into industrial settings [e.g. 3, 13, 16]. From this vantage point, the current project offered us a further opportunity to attempt to cultivate the students' reflective practice. By collecting material during the students' design projects, and returning it to them for analysis, we aimed to hand back to them their own design activity as a topic of study. In some way then, each student was compelled to reflect on their own design practice through attacking the research questions they were assigned.

Finally, we hoped that by unleashing fresh minds upon topical and demanding research questions that some headway could be made into important terrain for design research; in short, that the students would be able to contribute to design research, and do so in a way that would foster confidence in their own ability to participate in academic research discourse.

These considerations give us several yardsticks against which to evaluate the success of our endeavour. Namely, we can judge its value (a) as a venue for students to reflect on their own practice, (b) as a course concerned with the teaching of research skills, (c) as a means of fostering actual contributions to the research field, and (d) as the introduction of students to the research community and its practice.

We will begin by describing the teaching activity. In order to analyse our activities as educators, we selected one of the student research projects and have used it as a point of reference for what the students were able to achieve in the course, before we proceed to discuss it in view of the considerations listed above. We conclude with a short reflection on how this might inform our own practice as design educators.

THE DESIGN RESEARCH TEACHING CASE

The IT Product Design graduate programme in Sønderborg accepts 16 students yearly. Its focus is to educate interaction designers capable of designing user centred products in cross-disciplinary teams in industry. The teaching is studio based and project orientated, as in design schools, but the course is located in a university environment, and thus has a component of theory to support project work.

The first semester is organized in 5-6 short, intensive group projects. As we accept students with a range of backgrounds (design, engineering, economy, languages, anthropology and others) we have found this essential to bring all students on the same level of collaborative project experience, and to provide an overview of the field of interaction design. Each of the 2-3 week projects focus on cutting-edge themes within interaction design, such as the reflective design practice, design anthropology, pervasive computing, and tangible interaction. In each of the projects the students struggle with a particular case and with state-of-the-art literature, to produce a concrete output: A game, a video, a poster, a product mock-up, a user interface simulation, or a report. There is a constant focus on process reflection, and at the end of the semester the students are graded based on a 'portfolio exam', where they present a synthesis of their semester results.

Given the growing interest in design research, this past fall we decided to focus the last of the semester projects on the theme of design research. The central idea was to gather empirical data from the students' own design processes through the first workshops, then equip the students with research methods and challenge them to analyse the material themselves. As a result of this 2-week workshop, the students were asked to write a short essay in a scientific paper format, with proper introduction to the problem and research approach, references

to relevant literature in the field, scientific argumentation based on the empirical data, and grounded conclusions. To establish a forum for presenting such material, the students and faculty subsequently co-organised an international Student Interaction Design Research conference (SIDER 05) in Sønderborg [4].

In the introduction to the course we made clear that this would be an active 'studio-like' way of exploring the theme of design research:

> During this program we will introduce you to ways of doing research, and ways of analysing data in a careful and thoughtful way. We firmly believe in learning not only by being 'talked at', reading and reflecting, but also by actually trying to do research, being actively engaged in working with your data, and by having to communicate your new and emerging understandings to others. In this way you won't just read, think and listen, but also do, talk about and try to teach each other. [12, p.2]

We asked the students to work in teams of four, each selecting a different theme from the proposals put forward. By this time the students were well aware of the strength of multidisciplinary team composition, so they made sure, for instance, that the students with a language or communication background were spread out evenly.

Design research themes

We decided for a spread of four research themes to demonstrate the broadness of the field:

- *Events in the design process:* What discernable influence do the activities students have participated in have on the 'final' designed products?
- *Space organization:* Does workspace layout affect the design activity? How can organisation of the design studio support design?
- *Tangible interaction:* What do the mock-ups produced during the design process tell us about the domains we're designing for?
- *Design games:* How can games help expand our understanding of a design organisation?

The selection of themes mirrored the research interests among faculty and also represented contemporary discussions in the interaction design community.

In this paper we will concentrate on the theme of space organization and discuss how the student team worked to establish causality between the studio space layout and the design activities taking place therein.

The IT Product Design studio is a 100m^2 space with mobile desks, chairs, cupboards, pin-board walls. Throughout the first semester, faculty reorganize the space at the beginning of each project to nurture a specific working style and team-size. Students are free to modify the initial setup as they wish during the workshop. In this way we try to sensitize the students to the impact of workspace organisation and educate them to include space planning in the staging of their design activity.

Empirical data

We enrolled a few of our final-year Masters students in the effort of collecting empirical material for the research. The final-year students were in the process of focusing their thesis theme, and it was possible to find students for whom the extra effort was helpful in providing added experience.

In particular, two of the final-year students were interested in how space and technology in space influence people's activities. As a preparation for the new semester they had already organized workspace discussions with their class mates and improved the studio setup and furniture, so for them the activity of reorganizing the studio space with faculty and collecting material became a small action research effort in itself: To see if assumptions about each layout would hold in practice.

For the space theme, the final-year students collected the following data:

- Sketches of each new space layout, including faculty's intentions and assumptions.
- Photos of the studio taken daily from the same high vantage point at a particular time of the day (see Figure 1).
- Videotaped interviews with students made in the course of the projects on how they inhabited the space, and what they liked and disliked about it.

Research methods

On the first days of the workshop we introduced the students to general concepts of research (purpose, reliability, validity) along with a number of research and analysis techniques, in particular Grounded Theory [21] and Interaction Analysis [8].

Also, the course material handed out contained suggestions for research strategies for making sense of empirical data: look for patterns and regularities, celebrate differences, play with representation, make the familiar strange, make strange things familiar, employ the interpretive work of the hermeneutic circle etc. These strategies were drawn from a variety of sources [including 14, 23], our personal experience of working with data, and conversations with experienced researchers.

Scientific paper

As a result of the project we asked the students to complete a scientific paper in the 2-coloumn ACM conference paper format – complete with abstract, keywords, and reference list – and to present their research orally to the rest of the class. In this way we wanted students to get familiar with the writing style and argumentation tradition of scientific writing.

Conference organisation

To foster a more general interest in design research among interaction design students – and to provide our own students with the opportunity of presenting their work to a wider audience – we co-organised the international Student Interaction Design Research conference (SIDER 05) in Sønderborg. The conference was modelled after a conventional academic conference: Students from interaction design programmes were invited to submit short 4-page papers for review with a board of academics recruited among professor colleagues involved in delivering similar programmes. The conditions of the call set ambitions high:

1. The paper must contribute with knowledge about design. This is not a conference for merely presenting great design results, though product designs can be part of your argument.
2. The paper must be based on studies or experiments in actual design projects, or of design practice in companies. For instance, you can build on analysis of video recorded design sessions, design documents, design mockups, interviews with designers.
3. The paper must relate to relevant literature in design research and/or of research methods appropriate to the study of design. You need grounding in other authors' work.[1]

The conference programme filled two days with invited keynote presentations, plenary sessions, two to three parallel paper tracks and hands-on workshops. More than 100 students

[1] http://www.itproducts.sdu.dk/designresearch

Figure 1. A series of photographs of the studio space taken from the same vantage point at (irregular) intervals during a project; These shots are from the 'Design Games' project.

attended the conference from Scandinavia, Germany and the Netherlands; 22 student papers were presented and published in the proceedings. The conference review panel acted as chairpersons for the paper sessions.

For planning the conference the authors and a small group of students formed the organization committee that decided on the programme and practical organisational details. During the conference most of the IT Product Design students were involved some way or another to make the event run smoothly.

In the following four sections, we return to the concerns that motivated our initiation of this pedagogical exercise: our aim to make use of this as an opportunity to contribute to the students' development of design skills as a disciplined form of reflective practice; as an exercise in research skills training; as a means of enabling contributions to design research; and as a manner of introducing students to the research community of practice. In order to ground this discussion in the outcomes of the exercise, we will focus on one of the student-authors' research papers. We discuss their work in light of our aims for the course; any 'shortcomings' of that work identifiable in our discussion are intended (and should be read as) criticisms of our educational practice; if we are able to recognise what the students were able and unable to do, we alone (in our capacity as design educators) should bear the responsibility for unsuccessfully equipping them. We aim to make this point definitively clear in our discussion.

CULTIVATION OF REFLECTIVE PRACTICE

One way of interpreting the course we ran is as a disciplined form of reflective practice. We were inspired by related work in this vein, described in papers by Lloyd, McDonnell and Valkenburg [10, 11]. They report on an inventive approach they have employed to facilitate industrial design students' reflection on their own practice. In their experiment, student groups videotaped themselves performing a 150-minute packaging design exercise. Following this, the students were asked to spend the next few days editing this video down to a ten-minute clip that should accurately depict what happened. The exercise 'forced' the groups to find sense in their own process, communicating that through an edited movie.

In our case, students in our project were essentially conducting research on themselves, using data from their own projects as material for analysis. In this way, students demonstrably adopted an analytical orientation to material from their own design process. Obviously, this *is* a kind of reflection on practice.

Of course, our activity of giving students data from their own projects for analysis is not identical with the phenomena Schön subsumes under the title 'reflection on action', which, among other things, he identifies with 'stop-and-think' moments *during* activity. Ours is clearly a post-hoc reflection of a different order.

In any case, genuine reflection (much like genuine learning) is not solely of the kind witnessable in the text of an academic paper; genuine reflection must be incorporated into subsequent practice. In this regard, it is impossible to evaluate the degree to which the students reflected on their own practice in isolation of observing their tack to new design projects.

It is also worth suggesting that the format of the deliverable (an academic research paper) does not naturally or easily encourage reflection on 'personal' practice. Publishable research papers are necessarily addressed to audiences more general than oneself or one's design instructors, and the conclusions from them are expected to treat issues of broad concern and applicability beyond the cases that form the basis of their discussion. This is not to undercut the utility of conducting research from data of one's own practice as a form

privacy) for the separation of desks during the project. However, the authors also include an interview with a student from one group that started (and finished) the Design Games project in their own workspace. This interviewee cited his group's separation from other groups to be a *problematic* feature of the workspace. The authors note that there is a balance to be struck here, and allude that privacy may be situationally or personally relative.

In their conclusions, this leaves the authors in a somewhat ambivalent position; privacy is important, but not always. This is reflected in their recommendations, which suggest that workgroups be given 'enough open space', but not so much that they feel 'isolated'.

Evaluating the demonstration of research skills

Reviewing the authors' use of these concepts as analytic resources, and their use of data, enables us to discuss the practical research reasoning they demonstrate within the paper.

To begin with, the paper is themed: it begins with an explicit statement of the research question that accounts for the relevance of the topic and implicitly identifies an audience that might be interested in exploring the topic. It is also clearly structured: the conclusions address the question introduced at the beginning; the case builds progressively through presentation of the empirical material that is presented to substantiate their analytic categories.

The authors introduce and deploy concepts to do the work of building theory. For example, in order to mount their case, the authors begin with a threefold definition of a central term ('space'), illustrating the distinctions introduced in the definitions with empirical material. On the one hand, this tidily justifies the distinctions introduced as empirically valid; conversely, it also provides readers with an 'instructed way of seeing' [24, chapter 7] each piece of data. When data is presented, it is, then, *already* evidence of these distinctions.

While the concept of 'space' is defined explicitly, and the distinctions they introduce are substantiated, the paper could be strengthened from similar care taken with the notion of 'case'. Their argument that the aspects of space ('privacy' etc.) need to be considered in order to suit the particularities of the activities (the 'cases') would be well supported by a similarly crisp treatment of the relevant dimensions of 'cases' that they discovered during their analysis. While the primary concept is handled admirably, the paper would benefit with a disciplined treatment of its secondary concepts.

With respect to method and argumentation, what is of particular note is that while the authors use some form of grounded theory (e.g. data is coded, analytical categories are constructed from the 'ground up'), it is not methodological procedure *by any stretch* that is the principal resource for the construction of the argument in the paper. For example, the students did not follow the methodological guidelines outlined in [5]; they did not, for instance, write analytical memos. We want to highlight that the students' paper is not to be taken as an example of the naïveté of first-time researchers who 'go by the book': the directives of grounded theory are not applied to the letter, and the authors do not rely on the method to guarantee them the answers they seek.

Clearly, the method is insufficient to do (all) the work the authors want it to. Ingeniously, they manage to find a way of saying what it is they want to say without the method doing it for them, and they manage to do so within the format of an academic paper. They accomplish this largely by introducing ethnographic detail (from their participation in the workshops), and by common sense reasoning.

While it would be conceivable to compare their use of data to a methodological ideal, it is, we feel, of much greater relevance to instead inspect how it is the students actually used their data to address their research question. This particularly so, as the students were observably concerned more with forming the beginnings of an answer to their research question than with blindly adhering to methodological scruples.

In their conclusion, the students acknowledge that they probably haven't met the burden of proof required to pose a convincing answer to their research question. They state, "Although our intention was to arrive at a set of guidelines, we have not managed to gain a clear picture of the exact relationship between the various layouts [of the studio] and their effect on the design activities. Nevertheless, we are able to present some more general guidelines" [15, p.97]. These guidelines do not go beyond the analytic categories, but only restate them: privacy, workspace and distance to resources should be taken into consideration in designing studio space layouts. The weight to be given to each of these considerations should be dependent on the activities projected to take place during the project.

This is both a strength and a weakness of the paper. The paper leaves its reader with practical advice from having struggled with a difficult question [see 2, 17, 22 for contrasting earlier attempts to treat space use and activity]. At the same time, the advice is admittedly premature. From the point of view of people concerned with organising space, the recommendations may be useful; from the point of view of a research community who may necessarily be just as interested in the burden of proof required to make such claims as it is in the nature of the claims themselves, the advice is silent. What kind of research *would* be required in order to make claims of greater strength? What kind of evidence might be sought in order to further investigate this question? What should be done next to find out?

However, we also find displayed within the paper a healthy respect for the empirical material the authors had to analyse. In the collusion between their data and analytical categories, they discover contradictions. The 'privacy' episodes are the case in point. Here, the data is used to break the category's hold as an explanation for furniture rearrangement. Privacy is thus checked as an explanatory device. In this case, the authors show more fidelity to the empirical material than to the theory they are busy constructing.

What is perhaps the most obvious academic shortcoming of the paper should, again, be read as no more than a shortcoming of the course. There is no background research in the paper (e.g. how has space been treated as a topic in design research?) other than reference to research method. This was a consequence of the fact that the focus of the course was on analysis, academic writing and argumentation. These aspects were emphasised at the expense of providing the students with time for and material relating to relevant design research. The students were denied the luxury of borrowing conceptual distinctions from previous studies and applying them to their material. Instead, they had to introduce and define concepts of their own device. While this may turn out to have been a pedagogical coup, we had only decided to limit the focus of the course due to its compressed duration.

CONTRIBUTION TO DESIGN RESEARCH

Following from the present discussion, we can already recognise both merit and room for improvement when we view the authors' work as a contribution to design research. It is, we suspect, not in the conclusions but in the analytic categories generated from the data that the authors have made their most valuable contribution to the study of design studio space use. These furnish future studies with a useful, grounded set of

distinctions with which to analyse space organisation, and the relationships between design activity and space use. Researchers may also recognise wisdom in the perspicuous logic used to tackle the problem: if we can track the rationale for the changes made to a flexible studio space, then we might be able to deduce guidelines for how space can be better configured to suit activities.

As intimated above, however, we can identify some shortcomings in the strength of the claims made, and possible improvements to how this might be better addressed to a design research audience (i.e. by inclusion of methodological, rather than just practical recommendations). To speak generally, the conclusions are too general; or more precisely, they are articulated in a manner which invites the criticism that the authors generalise too eagerly. From the data that is presented, the paper can speak to issues of general concern to the research community. But there are subtle differences between the authors' general claim that "given a flexible system, students will to a degree change their studio space in an effort to better suit their activities" (which is the opening sentence of the authors' conclusion) or the dictum to set up space in relation to the activities that will be conducted in it (c.f. their closing sentence), and other kinds of claims that may also be recommended by the data.

One missed opportunity is that the students don't (in their conclusion) acknowledge in making this latter claim that the studio spaces they were analysing *were* in fact set up with the activities of the workshops in mind (though this is something they do acknowledge within the paper itself). They were designed by the tutors running the courses. This might beg a different question, then, as to what aspects of student activity (and hence space 'needs') might have been difficult to predict? What alterations to the studio layout were ad hoc, contingent decisions, rather than foreseeable consequences of planned activities? What aspects of the studio setup might be put down to poor planning or just bad design?

The point we are making here is one of some importance, and one that we did not foresee: student-authors tended to treat their work as a *terminus* of inquiry, rather than as an initial, exploratory or partial contribution to a much larger field. In retrospect, this should not be surprising considering we did not provide materials for them to 'get into' a research field, or to look much at previous work. There is no reason to presume that the fact that research questions can (and almost without exception, *do*) have only partial answers in single studies should be a self-evident feature of academic inquiry.

Indeed, this is a feature of research that we could not have articulated before being confronted with students' research. Outside of a pedagogical situation, what possible occasion could we have had to formulate it? It might be possible to say it was known by us, but if so, only 'known' in the doing (of research), and not in the telling [c.f. 18].

INTRODUCTION TO THE RESEARCH COMMUNITY

An academic research community has its own culture and practice, which is quite different from a design practice in industry or in a design studio. Learning theorists have taken seriously the notion that learning is misconceived when it is considered the accumulation of knowledge, and instead relate learning to degrees of participation in professional communities [9]. To this extent, perhaps the most valuable part of the course was not in its content or outcomes, but the enabling of students to participate in (academic) practice through the hosting of the student conference in January.

This is, however, also the most difficult aspect to evaluate with any degree of assurance. While there is little doubt that students who organised and participated in the conference found the experience rewarding, it is another thing to attempt to determine how 'enabling' that experience was, or even what kinds of academic competencies were strengthened by it. We note, with due irony, that it is precisely the conceptions of learning that endorse such expectations (e.g. expectations like 'degrees of learning should be unproblematically assessable') that scholars such as Lave were attempting to escape from in reinventing 'learning' as a form of participation in social, professional communities. In any case, we are left little means to do more than offer that students have themselves hosted, organised, experienced and participated in an academic conference. This entailed having their papers reviewed by senior academics (many of whom they subsequently met at the conference), conducting workshops, delivering paper presentations, hearing keynote speeches etc. It also provided the opportunity for students to compare and contrast their own work with that of their peers at various other Interaction Design programs, and to discuss methods and findings amongst themselves.

It is one thing to teach students research skills and have them write papers for assessment in an (cocooned) institutional setting; it is quite another thing entirely to bring an academic conference to them, to enable them to experience a vital form of academic practice for themselves. There can be no doubt that such participation can be a rich site of learning. Demonstrating that it is in fact so, however, is another matter.

CONCLUSION

We have sought in this paper to describe and reflect on a course in design research delivered to graduate Interaction Design students. We have looked at four respects in which this course offered promise to design educators and students. As a form of disciplined reflective practice, it enabled students to make recommendations for the organisation of design projects using their own material as evidence for their argument. As a pedagogical exercise in instilling research skills, it successfully challenged students to work with data in a disciplined fashion, to build a case in response to a research question, to write a 'scientific' paper and to argue in an academically serious way. As a means of fostering contributions to design research, it was modestly successful, and as a method of introducing students to a vital aspect of academic practice it shows considerable promise.

But primarily, this has been an opportunity for us to reflect on our own educational practice. In this regard, our experience with this course gives us much food for thought. For a start, there are ways such an exercise could be a much more valuable tool for developing students' reflective practice. This may require little more than requesting that as a part of the students' conclusions, they volunteer recommendations for their future practice based on their analysis of data. There is also room to attempt to find stronger ways of incorporating research/analytical thinking into design practice, and there is much to be gained from developing a culture of research-quality reflection on one's own practice. But clearly this is an issue that requires much more deliberation.

We are satisfied that this served as quite a powerful introduction to training in research skills. While the research results of a two-week introductory course will never offer insights comparable to the analytic genius of a Goffman, we gain confidence from what the students were able to do research-wise: in terms of constructing an argument from data, treating data with respect, addressing a research question, structuring an academic paper etc. Taking into account the tools with which the students *weren't* supplied (such as background research, or much chance to address their work to a research field), we are not dissatisfied with the outcomes as statements of what can be learned with respect to doing

scholarly analysis. Following from this, we would anticipate that a course that can additionally introduce the students to related research and provide a research field as an audience would enable the students to make stronger contributions to design research.

As educators, we learned a great deal by being given the opportunity to identify assumptions about research or research papers that the students held. These assumptions are observable in the ways that the students' papers stand in contradistinction to the ways that design research (as we conceive it) might ordinarily conclude or draw recommendations from its work. As educators, it is only through being confronted with these kinds of implicit assumptions (e.g. the pull to fully address a research question within the paper, or to treat this paper as a terminus of inquiry) that we can move to address them in subsequent courses. There is, of course, nothing wrong with these assumptions; it is only to the extent that we are attempting to prepare these students to participate in an academic community of practice (i.e. one that may not share these assumptions) that this will ever emerge as a 'problem'. In this regard such revelations are invaluable as stepping-stones in our own reflective practice that seeks to best equip design students for the multifarious roles they must prepare to assume as graduates.

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