

THE DESIGN INNOVATION GROUP: ORIGINS, DEVELOPMENT AND FUTURE

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interviews

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This contribution is an edited transcript of an interview between David Walker and Robin Roy that took place in January 1999 about the origins, aims, research achievements and the future development of the Design Innovation Group (DIG). Robin and David founded the DIG in 1979 at the Design Discipline (now the Department of Design and Innovation), the Open University. Robin has headed the DIG since its establishment and growth into a two-centre group with branches at the OU and the University of Manchester Institute of Science and Technology (UMIST).

ORIGINS

David Walker Can you give a brief account of the origins of DIG?

Robin Roy I've been looking through these past DIG Annual Reports and it is difficult to believe that it's 20 years since you and I began discussing the formation of DIG

So much has happened in those years that I couldn't possibly talk about it all, even if I could remember it.

DW Do you remember the very beginnings ?

RR It was significant to me that it began in the Design Department at the OU because that was not a conventional Design Department. We were interested, even then, in the economics and the management of design, as well as in design practice.

I was very aware of the innovation research which had been going on at SPRU (The Science Policy Research Unit). There was already a body of work looking at success and failure in R&D and in innovation. It occurred to me there was very much less known about design in a parallel way: for example, about how important design was economically, how it related to incremental innovations, which are the largest category, how were products generated, created, manufactured and sold.

The further trigger was an emerging government interest in design. For example there was the Corfield report in 1979. In this context, it seemed opportune to do some research in this area. I think you and I had been talking about this, as you had joined the OU recently.

DW I'd been there on and off since 1974 before I came in full time.

My recollection is that we had these courses in the Design Discipline that were mainly about the context of design and design methods. They were good in their own way, but they were hanging back from the central activity of design, from the prosaic reality of design within industry. This certainly had an implication for what we might then do in teaching as well as research. It corresponded well with what Corfield and others were saying at the time. We needed to study real cases and get our feet wet in the business of design.

PILOT STUDIES

RR Our original idea was to carry out a study of Design Council Award winners similar to the study of Queen's award winners of innovations that had been done some years before. I went to the Design Council, the DTI and various other bodies to try and get some funding. Eventually in 1980 the OU Research Committee gave us some money to do a pilot study, 'Good design and business success'.

So we had some money to bring Vivien Walsh, then a research fellow at the Science Policy Research Unit to the OU. Vivien brought along knowledge of the plastics industry and I was interested in bicycle design, so initial pilot studies were of the plastics products industry and bicycles. And you did some initial pilot work in the car industry.

Figure 1

DW We had been doing some visits to car companies for the undergraduate course T263: Design Processes and Products at that point.

RR So plastics, bicycles and cars were the three areas which we looked at in the pilot study. In the plastics industry we did some quite careful analysis and came up with the result that the design-conscious, award winning firms did better on various business indicators than the 'typical' firms. But it was also clear that awards for good design alone certainly didn't guarantee success. When we looked a bit more closely we realised that the successful firms were not only good at design, they were good all round – in marketing, production, quality control as well as design, so design was one aspect of a well managed company.

When we published our first major report, on design and business success in the plastics industry, we got a fair amount of attention. Later some grants from the Open University and from the joint ESRC/SERC Committee extended that work to some further industries and to international comparisons.

Figure 2

RESEARCH FELLOWS

DW About this time, Margaret Bruce got involved and we also had John Towriss from Cranfield on board.

RR They came as Research Fellows This wider ranging international study confirmed basically the results of the original pilot study – that good design can contribute to commercial success but you can not guarantee it by design alone. Really successful, design-conscious firms, like Lego the toy maker, had a long term strategy based on innovative technology, evolving designs and understanding their markets.

*DW Was the underlying aim behind all that activity just an **investigation** of design and design professions or was it something else?*

RR I don't think we were **exactly** crystal clear what we were about at the beginning. We were **exploring** the interface between design and business, design and economics and how design could be effectively managed and practised in companies.

INNOVATION AND GENERALISATION

*DW Was **design** seen as a sub-set of innovation because innovation was the focus of the prior studies?*

RR I would express it the other way around, innovation is a subset of design. Everything has to be designed, every piece of a machine or product has to be designed. Only a relatively few of those are innovative, either technically or in some other way.

Apart from the details about commercial performance, we gathered a lot of information about the design process. What emerged from that was **firstly** there is a kind of common underlying process, but **secondly** there were very great differences in practice between companies. They all did something very different, so it was quite difficult to generalise about processes and best practices. We can generalise at a fairly high level but not at a detailed level .

DW *But in the immediately prior period there were high level recipes – labelled ‘Design Methods’. So in a sense, what we were doing, as a corrective, was to scrutinise things at a more detailed level, to see what is the evidence for saying that these Metastructures exist . If you discover they exist then that can be useful in many respects. But when we examined processes at another level of detail they were hugely heterogeneous and sometimes quite eccentric.*

RR Yes, absolutely, eccentric.

DW *So how do you generalise from that? It seems to me that problem has not gone away.*

RR No I don't think it has. There has been quite a lot of recent research which has shown that general patterns in organisational culture and the way companies do things historically, generates very complex interdependencies.

DW *Even when we generalise from those **recent** kinds of more intelligent management observations across to a hugely various sets of practices it can be very unconvincing. Some processes are very fuzzy; some are very dependent on local conditions and local technology ; some are locked into people's individual skills. It is just an extraordinarily chaotic. It is a quagmire if you're trying to make it explicit as a universal process: if you want to make theory , make processes completely explicit , generate principles, evaluate them , make them measurable, make them part of the bottom line. All that is still out of reach.*

RR I remember we tried to map all these different processes that came out of the different companies, using spider diagrams They all look so different. I started tearing my hair out! What do you do with these? In the end I don't think we did very much with the maps because it was **difficult to generalise** in any way.

DW *When you look at Wheelwright and Clark and their later development model, the ‘development funnel’ this is a generalised simple structure which I think is plausible. When you ask people to give their version of the development funnel, they have these eccentric embellishments, and improvisatory elements. Maybe that's how it is: **a** very primitive model but with a huge area of local improvisation.*

RR I think that's how it is. Everybody is reinventing the process all the time, for their own reasons, either good or bad, but that seems to be what happens in the real world.

Figure 3 a)

Figure 3 b)

EXTENDING THE RESEARCH: THE CID STUDY

RR When we published the results of all this work, the Design Council and other people became very interested. DIG was becoming known by the 1980s and so we were invited to bid for a ESRC/Design Council project . That led directly to what's the Group's best known project so far – the Commercial Impacts of Design, which started in 1987 as a joint project between the OU and UMIST. By then Vivien Walsh and Margaret Bruce were academics at UMIST and so they were joint investigators with us

The previous project had the difficulty of defining what is 'good design' – the idea that Design Council award winning products were 'good designs' was questionable.

So instead of looking at this output of good design, we thought we'd look at the input. We looked for professionals qualified in design working with small and medium sized **enterprises** (SMEs). At that time, coincidentally, there was a Government scheme for supporting design so a large number of SMES took part in government-subsidised projects.

We looked at over 220 such design and product development projects to see what the outcomes were. We called this study CID ('Commercial Impacts of Design'). For many years I believe it was the only work anywhere in the world that provided quantitative statistical evidence about the commercial benefits of professional design.

Apart from the commercial value of these projects to the companies, they learned a lot about design management, such as the importance of briefing the designers properly and keeping in contact with them . Even with most failed projects, the companies felt they had benefited.

Since CID, our method was licensed for use in Spain, Holland and France. These international studies came out with similar results.

Figure 4 a)

Figure 4 b)

FOLLOW UP: THE MADRID STUDY

RR Then in 1995, eight years after our original CID project, the OU part of the group was awarded a Design Council grant to conduct a follow-up study. This was called MADRID, which stands for 'Market Demands that Reward Investment in Design'. This has produced some interesting results about the long-term benefits of investing in design and innovation. It was also useful in dissecting the role of design has and how it affects the competitiveness of individual products.

DW Design was something more than cosmetic?

RR Yes, we found that in successful projects design had been used to produce genuine improvements of the products in features, performance and quality – and were not just re styling exercises. The Design Council used the results as part of a submission to the Government in its 1998 White Paper on Competitiveness.

Figure 5 a)

Figure 5 b)

BUILDING CASE HISTORIES

DW It seemed to me what was important about DIG activities, in the period that you have just described, was the business of getting into companies and then coming back with case histories. Even if they were not all written up as extensive teaching cases, the benefits lie in the perspective, the detail, and the first-hand stories from the people who have been directly involved. All that to me was hugely significant. It became very influential on teaching in the OU in Technology and in the Business School and elsewhere. For example, you went to see James Dyson during this period didn't you?

RR That was done originally for an OU video on creativity in design. That course material arose in turn from the bicycles study which was part of the DIG research.

I then started looking at what was common in the design thinking of Dyson and other creative people. This led to an article based on the analysis of these individuals.

So that was research arising out of teaching, which in turn arose out of research.

Figure 6 a)

Figure 6 b)

AIMS

DW Perhaps you could say something more about the aims and intentions of DIG?

RR The first aim was to improve understanding of the processes, management and practices of design – particularly successful practices of design.

The second aim was to apply this understanding to the development of educational material on design management and practice.

As DIG evolved we started looking at innovation as well as design. And in one or two cases we've worked more closely with industry.

DW Can you give me examples of this ?

RR The main examples were from the Manchester branch of DIG. Margaret Bruce and Rachel Cooper had a grant from the EPSRC to look at how the market, user and technical requirements for products were established in industry and how those could be translated into terms which designers could use.

Similarly Ed Rhodes from the OU had a series of EU funded projects to do with the textile industry: how its supply chain was organised and the influence of IT on 'fast response' retailing.

GROWTH AND STRUCTURE

RR In 20 years DIG has grown just from two academics plus one researcher, (you, me and Vivien) to become internationally known with branches at the OU and UMIST.

Four main programmes have emerged:

First, there is the *Design and Innovation Management Programme* which includes the CID and MADRID projects and a number of other projects at UMIST, such as the study that Margaret Bruce and Vivien Walsh did of the Design Consultancy Industry in the UK and Scandinavia.

Second, there's now a *Design for the Environment Programme* which started at the OU in the early 1990s. The main project we've done is on Green Product Design which concerned British, American and Australian firms who had developed 'greener' products. One of the things it showed was that environmental friendliness was not really a major factor in customer choice of products. Nevertheless incorporating environmental factors in design did seem to give an extra competitive edge. Most of the products were successful commercially as well as being less damaging environmentally. This research has led to Ph.D. students carrying out green design research. For example Mark Smith, who helped write the Green Design report, is completing his own work about how small companies are responding to environmental pressures

The other two main programme areas are:

The *Transport and Environment Programme* led by Stephen Potter, jointly with the Energy and Environment Research Unit of the OU. Stephen has recently completed a major EU project on sustainable transport, which is the subject of his paper in this Special Issue.

The fourth area is the *Design Studies Programme* comprising more theoretical projects, for example, on the evolution of designs and creativity in design.

NOTABLE SUCCESSES

DW What do you think of as the notable successes and influences of DIG?

RR In publications, there is the book Winning by Design, by Vivien Walsh, Margaret Bruce, Stephen Potter & myself, which is an account of the early DIG studies, eventually published in 1992. It has been used on several design management courses.

Certainly the Commercial Impacts of Design report had a major impact. It was covered in a number of national newspapers and all the design journals. It was picked up enthusiastically by the Design Council and the Department of Trade & Industry (DTI). At that time, there was a DTI programme called 'Managing into the 90s'. They produced a series of booklets on product development and the results of our work were quoted in a number of these. The DTI also published a summary of the CID study.

Since 1981 DIG members have been awarded over £1.2 million in research grants, including five of the major projects under the Design Council Co-partnership programme. Several of the papers in this Special Issue arise out of that programme.

DIG members are also Editors or active on the Editorial Board of several academic and design journals including of course you as founder and editor of *co-design*.

DW *Co-design is now in a hiatus. We ran for 3 years and about 7 or 8 issues. We are building an electronic web site where the past issues can be accessible and from there we will add new material.*

Figure 7

CROSS-OVERS

DW Can you say something about spin offs into OU and other teaching?

RR As I said earlier, DIG's second main aim is to disseminate research results. We have provided material for several OU courses. You chaired the first undergraduate course, Design Processes and Products, in which DIG studies of the cycle industry provided the basis for the material which I wrote on creativity. That was further developed in the successor course, T204: Design Principles and Practice.

I have already mentioned the BBC/OU video on Dyson. And there is the input to the OU Business School through your post-graduate course Managing Design, for

example via the case study of Arcam, one of the companies from the original CID study.

DW To me it seems there are two major influences DIG has had on OU teaching.

Firstly is the case study reporting back from industry and making a filtered version or a digested version of reality. All that to me is hugely important and very valuable in teaching because it is up to date material, and it feels fresh and first hand.

Figure 8

EVOLUTIONARY PERSPECTIVE

DW The second thing is to do with the evolutionary perspective . I thought was very powerful in your bicycle study and those diagrams of 100 years of history in bicycle design. That can only come out of reviewing an array of materials over a long period. Here it was re-presented in an undergraduate course but to me it is much more important than that. Because its about studying a lot of complicated information and presenting it in a clear intelligible and visual way.

In the Arcam study one of the things we did for them was to represent their own history to them They had never done that before, because companies do not have time to be reflective, or analytical in an historical way. They are too busy dreaming up the next products, there's no particular reason why they should be historical or analytical.

That was another important lesson for me because I think more companies should be retrospective – if they can't do it themselves, then they should be commissioning outsiders like us to do it for them.

So those are the two things that DIG gave the OU which are crossovers. The case study as a design story on its own merit: and contextual evolutionary charts or diagrammatic presentations of complicated information.

RESEARCH INTO TEACHING

RR I believe very strongly in the two-way relationship between research and teaching. And it's not just from research to teaching, it's from teaching to research and then back in several iterations.

For example, the Advanced Passenger Train case study by Steve Potter is a good example. He originally did this case study for the *Design and Innovation* course, then wrote a book based on that. Later, a senior person at British Rail read the book and

decided to commission Stephen and I to do two projects, one on rail systems procurement and another on future rail technologies. That led us to new research and part of this research led to further studies of high speed rail systems world wide. This was then fed back into producing the revised version of the High Speed Trains case study in the replacement for the original Innovation course, now called Innovation, Design Environment and Strategy (IDEAS for short).

Again, another example of the two -way relationship occurred when I did a video case study for the IDEAS course on the development of the New Wave washing machine.

That was done originally for teaching purposes, but it was a company in our Green Products Survey. So the information was used later to write up two articles and a book chapter about Green Product Development as a case study example.

Figure 9

Figure 10

THE FUTURE

DW. In conclusion can you say something about the future direction of DIG?

RR From my point of view, Design for the Environment is a key area of DIG research for the future. For instance Stephen Potter and I are participants in a five country EU project on the Sustainable Household led by Ken Green of UMIST, and also in the Design for the Environment Multimedia Implementation project led by Martin Woolley at Goldsmith's College. Recently, we had a DIG workshop to discuss research on new product-service systems. I think our future direction lies in shifting beyond design of individual products, to thinking about the design of systems. My current interest is in these complex mixes of products and services which offer the potential for major reductions in environmental impacts. DIG have just got an OU grant for this research. It's a bit of a shift away from the original DIG direction, but if these new product-service systems can reduce environmental impacts by say a factor 10 or more, they also must be economically viable and attractive to users. All that is a tall order for designers and requires a really high level of creativity and innovation.

My hope is that this will be a renewed stimulus for DIG. Sometimes it has been difficult to sustain the original collaborative work between the OU and UMIST, to maintain the contact and momentum that we've had in the past. We need a new research catalyst to invigorate us and allow that kind of collaborative effort to flourish again.

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BIOGRAPHIES

David Walker is an architect, designer, and specialist in distance teaching. In his first career as an architect, he specialised in urban social housing. After a period teaching in schools of architecture, he moved to the Open University in 1979. There he was course team chairman of two pioneering courses T263 *Design: Processes and Products* and P791 *Managing Design*. He was the co-founder of the Design Innovation Group with Robin Roy. He worked in the Open Business School for four years mainly as an author on their MBA programme for B882 *Creative Management*, for which he co-edited with Jane Henry, the course reader *Managing innovation* (Sage, 1991).

He left the Open University in 1997 to run his own consultancy. He is closely involved with post graduate programmes at Brunel University, Middlesex University, UNITEC New Zealand, and Hong Kong Polytechnic University. He has travelled extensively in the USA and in Australasia. He plans to be in New Zealand at UNITEC for 12 months beginning in January 2000.

Robin Roy is Professor of Design and Environment at the Open University with a B.Sc. in mechanical engineering and M.Sc. and Ph.D. degrees in design and planning from the University of Manchester Institute of Science and Technology. Since joining the OU in 1971 he has chaired and contributed to many courses, including *Man-made Futures*; *Design: Processes and Products*; *Design: Principles and Practice*; *Design and Innovation*; *Managing Design* and *Innovation: Design, Environment and Strategy*.. He is head of the OU/UMIST Design Innovation Group, which he founded

in 1979. His research interests include ecodesign and sustainable technologies, the management of design and innovation, and the design evolution of bicycles and railways. He has written or edited eight books and published over sixty research papers on these and other topics.

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