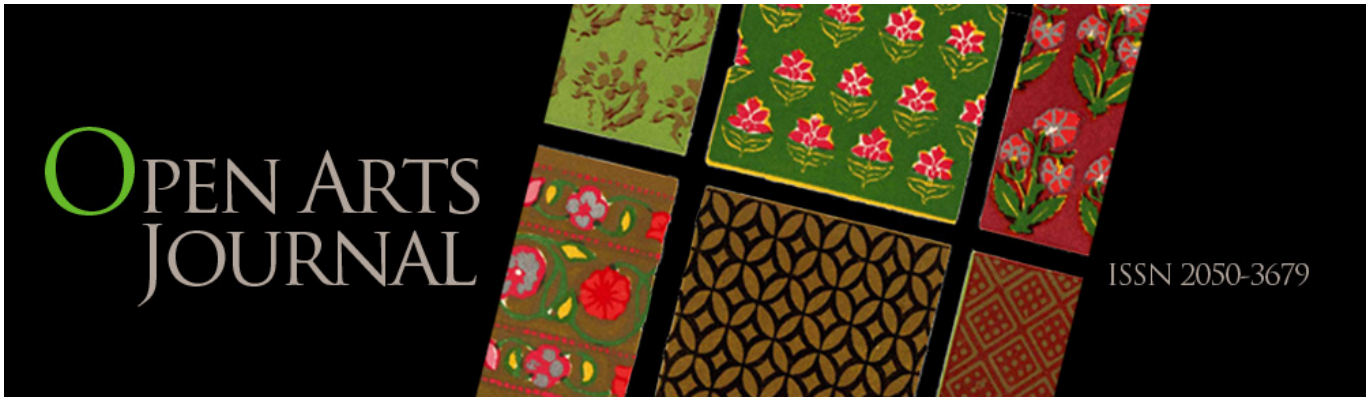

DESIGN EDUCATION IN THE OPEN

Nigel Cross and Georgina Holden

Abstract

From its inception in the 1970s the UK Open University faced the challenge of teaching design to students at a distance and with open entry. Teaching design 'in the open' has required creative approaches to aid students in the acquisition of requisite skills, knowledge and values. OU design courses pioneered the teaching of design for a broad, non-specialist audience and in identifying the particular characteristics of design thinking, influencing not only OU students but wider teaching in the higher education sector. These principles have been applied during the development of design education at the OU from printed text and broadcast TV into the use of digital media and the Internet. Over time, technological changes, together with concomitant changes in HE generally, have brought different modes of design education closer together, but the OU continues to pioneer in design pedagogy.

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Biographical notes

Nigel Cross was the first lecturer appointed in Design at the Open University in 1970 and is now Emeritus Professor of Design Studies. His books include *Designerly Ways of Knowing* (Springer, 2006) and *Design Thinking* (Bloomsbury, 2011). He is Emeritus Editor in Chief of the design research journal *Design Studies*.

Georgina Holden was one of the earliest students of Design at the OU. She is now a Senior Lecturer in Design and Innovation at the Open University where she has worked in a variety of roles since 1984. She leads the BA/BSc Design and Innovation programme and has contributed to the development and materials of all of the current core design modules.

DESIGN EDUCATION IN THE OPEN

Nigel Cross and Georgina Holden, Design Group, The Open University

Introduction

Since its foundation fifty years ago the UK Open University (OU) has pioneered many innovations in education. Some of the most significant and influential innovations have been in design education, where the OU has not only broken new ground in developing distance learning methods but also created new approaches to design education, and the development of design as an academic discipline. Significant advances in knowledge, developed through education and research at the OU, include breakthroughs in the academic understanding of design as a subject as well as design as a fundamental human activity and a set of skills that can be developed in everyone. In this paper we recount how some of the early experiments in creating an open version of design education still resonate widely today, and how more recent developments with digital media continue to advance design education through new interpretations and approaches.[1]

The Open University was founded in 1969 to provide open-entry, degree level education through the radical innovation of distance teaching, offering the opportunity of home-study higher education for people who had not previously had access to it. Originally conceived as a 'University of the Air' using national BBC television and radio broadcasting, its implementation was primarily through postal delivery of specially written text materials. TV and radio broadcasts were important components but supplementary to the texts. Some face-to-face tutorial support was available across the country and some courses, particularly the first year 'Foundation' courses, required students to attend week-long summer schools for practical group work and other experiential learning activities.

Undergraduate admission to the university has always been completely open, with no entry qualification requirements. This has led to a demographically diverse range of students, significantly different from those of students in conventional universities. In particular, the great majority of OU students study part-time and at home. The number of students studying with the OU each year is now around 190,000 spread across a full range of academic disciplines. Of these, more than 2000 study the core modules in Design. The average age of OU students, in most disciplines, is around 35 years. Older students can have different personal and social perspectives such as family or employment commitments and bring a depth of experience which can be particularly relevant in project work. This can also influence the style and approach of teaching, for example in the range or type of case studies offered to engage students and in assumptions on how students will respond to the materials.

From the OU's inception, Design was included as a core discipline alongside technological subjects within the Technology faculty (now the STEM faculty). However, OU Design academics have tended to regard their subject as positioned between science and engineering on the one hand and the arts and humanities on the other. Since 2010 the OU has offered a degree programme in Design and Innovation that enables students to combine their studies in the core design modules of *Design thinking* (Stage 1), *Design essentials* (Stage 2) and *Innovation: Designing for change* (Stage 3). Students choose additional complementary subjects in a variety of themes drawn from either the arts, humanities and business or engineering and computing to complete either a BSc or BA degree.

In contrast to design education in traditional universities, where face-to-face lectures, seminars, and studio work are the main vehicles for teaching, for an OU academic the teaching task primarily takes the form of developing sets of integrated teaching materials that need to be pedagogically sound and sufficiently 'future-proofed' for them to be used for a course life of around eight years. These take the form of text and complementary learning materials in a variety of other media, designed to be accessible to a wide range of students. The uniqueness of OU design materials is a direct result of the need explicitly to articulate principles and processes which are largely transmitted through a combination of praxis and a heuristic approach in conventional design education. These novel teaching materials, developed from necessity in the OU, have influenced approaches to design education more widely. Ideas have spread through the growing numbers of alumni, published teaching texts, public broadcasts, online materials, and through the part-time associate lecturer staff, many of whom not only provide the main tutorial support for OU students but also teach in the conventional higher education sector.

The challenging nature of developing an open design education meant that there was a strong

1 We appreciate the work of all our colleagues, past and present, who contributed to the development of design education in The Open University. We are grateful to Rachael Luck for suggesting, commenting on, and contributing to this paper, and to Renate Dohmen for her reviewing and editing.

and continuing interaction between teaching and research in relation to design at the OU. In particular, the unusual demands of an open learning approach to design education prompted studies into the fundamental nature of design ability and its nurture through education (Cross, 1982, 1990, 2011). The work carried out primarily for OU teaching purposes is also significant, such as the generation of case studies and experiments with new educational media, which has led to research publications and projects. Examples include Robin Roy's studies, originating in work for OU TV programmes that focused on innovation through design, such as James Dyson's bag-less vacuum cleaner and Mark Sanders' folding bicycle (Roy, 1993); and the 'ATELIER-D' research project investigating the ways the traditional design studio model of teaching might be transformed into an online virtual-environment model for distance learning (Hart, Zamenopoulos and Garner, 2011). OU academics have also studied their own innovations in design education for relevance, effectiveness and impact, and published such reports more widely, including on the teaching of creative thinking (Lloyd and Jones, 2013), the use of virtual learning environments and technological interfaces for design teaching (Jones, Lotz and Holden, 2020), and on the broader development of design thinking skills (Garner, 2005).

Establishing an open design pedagogy

Given the remit of the Open University, the first OU Design academics faced the necessity of developing a new concept of design education that was open to everybody and could be taught at a distance. In conventional design education, based on selective entry and orientated to preparing students for professional design practice, the 'signature pedagogy' (Shulman, 2005) relied on project work and studio-based 'atelier' or 'over the drawing board' teaching methods. This pedagogy could not be readily adapted to the distance teaching of the OU. Some form of project work could potentially be fitted into the OU teaching system, although OU students lacked the intensive support – from both tutors and fellow students – that could be provided in conventional education.

The small group of academic staff tasked with creating OU design teaching in 1970 therefore faced the considerable challenge of adapting, changing and developing the traditional pedagogic approach into one fit for distance delivery to a very wide audience. In effect they were redesigning design education and creating a very different version appropriate for the general population, rather than solely for specialist design students.

The staff's emerging radical vision of a design education for everybody was indicated in one of the first OU design teaching texts on the unusual theme of 'Designing as a response to life as a whole'. One of the new Design lecturers, Chris Crickmay, set out the aim of this education as:

> The extension of design skills from the specialised areas in which they are traditionally applied by professional designers to life-as-a-whole in which, at present, it is nobody's business to act with imagination and with constructive insight.
>
> (Crickmay and Jones, 1972, p.4)

Project work would not be based on the set endpoint of design for a specific product, as in conventional design education, but would offer the possibility of

> … escaping from the inhibiting effect of having specified end-results: the means of this escape is to concentrate not on the endpoint, or purpose, of designing but on its beginning … This opens up the possibility of unexpected, unforeseeable, and perhaps marvellous, results which could influence not only specific products but the pattern of life as we experience it.
>
> (Crickmay and Jones, 1972, p.4)

It is important to note that, at its inception, the OU did not offer specialised, named degrees, but a single, general degree in which students could choose and combine different subjects. Therefore, OU students of design were not assumed to be following, or seeking, the kind of vocational design education that was provided by schools of professional design such as architecture or industrial design. Rather than vocationally oriented students, OU design students were perceived as being laypeople interested in design and in engaging with social and environmental issues of technology. In response, Nigel Cross outlined a new approach for a design education for laypeople, based on:

- the process of design, rather than its products;
- the socio-technical context of design decision-making, rather than on technical expertise;
- deciding what should be designed, rather than on detailed designing.

He added:

> This kind of education needs the development of courses that tend to be about the politics of technical change rather than about the professionalism of maintaining the status quo, about the implications of design rather than the

> practice of design, about problem-finding rather than problem-solving, and about designing for yourself rather than for someone else. Many people might not regard such courses as 'design' education at all – but I think it is the kind of design education for laypeople that all of us need.
>
> (Cross, 1979, pp.71–2)

In this respect, early design education in the OU prefigured new forms of design education that were soon to appear elsewhere, with the introduction of design in general education. In the UK, the new school subject of Design began to replace traditional craft and some art education. The high-level goal of this new subject was expressed by Bruce Archer, of the Royal College of Art, London, as '… achieving a level of design awareness in the general community analogous to literacy and numeracy' (Archer, 1979, p.3). This was the formulation of a radical view of design as a third area of education, alongside, and potentially equal with, sciences and humanities. The OU's version of design education thus became a significant contribution, not only to a broader programme of design in general education but also to a new form of general education in design, for a much wider audience than design professionals.

Early experiments

At first, there was substantial uncertainty within the OU Design group about how to teach design at all through the new distance-learning system of the Open University. The initial problem as it was perceived by the Design academics within the OU in 1970 was that 'the medium is the message' as Marshall McLuhan had claimed (McLuhan, 1964), and the media approach of the OU seemed to regard the student as a mere receiver of pre-packaged knowledge. Such a role is particularly inappropriate in design education; skills and design ability need to be developed and cannot simply be transmitted through a passive communication medium – the student needs to engage actively with the designing and learning processes. The very first attempts at distance-teaching design at the OU therefore were tentative and tended to concentrate on raising design awareness rather than developing design ability.

In consequence, the approach taken in the earliest OU Design learning materials presented the general principles of design rather than a particular design specialism. Attention was placed on the context of design, social and environmental issues of technological change, and on encouraging students to consider broader impacts of design decisions. For example, a television programme made for the Design element of the first OU *Technology Foundation* course (1972), called 'Design Failures', used examples of failures in urban housing and transport systems design to discuss the varied and sometimes unforeseen impacts of design, and the politics of design decision making. That same programme (called a 'design probe') also addressed the problems of teaching design through a medium such as broadcast television, by making the context of production explicit, which challenged the established practices of BBC TV directors. Thus, the camera view was pulled back from the presenter of the programme to show the studio with its other cameras and operators, microphones, lights, etc., to demonstrate the restrictions of studio-based TV. The presenter, OU lecturer Nigel Cross, then went on to emphasise that learning to design required an active engagement with designing, rather than the passive consumption of a TV programme. At the summer schools for the same *Technology Foundation* course, the student role in the use of TV was reversed and Design students were given then-new portable video recorders to make their own videos. An extract from the 1972 'Design Failures' TV programme can be viewed at **https://www.open.ac.uk/library/digital-archive/clip/clip:T100_33_01**

Other media experiments were also introduced in teaching materials, such as loose-leaf collections of writings and poster-exhibits, rather than the standard bound books, a pack of stimulus cards to assist design thinking (now a technique widely used in design practice), tutorial material presented on audio-cassettes, and phone-in radio programmes during which students could call in their questions to the lecturers.

Increasing confidence

After initial contributions to the foundation course in technology, the first full OU Design module was the second-level *Man-made Futures* (first presented in 1975), which laid much of the groundwork for future courses (Figure 10.1). It integrated the development of design thinking skills with elements focusing on broad technological themes of shelter, food and work, and included a set book on *Alternative Technology and the Politics of Technical Change* (Dickson, 1974) alongside a set of readings in society, technology and design (Cross, Elliott and Roy, 1974). This very broad approach reflected then-current issues of the mid-1970s in futures thinking and the 'counter-culture', influenced by writers such as Robert Jungk, Theodore Roszak and Ivan Illich, and perhaps the first proponent and practitioner of 'critical design', Victor Papanek, who famously opened his book *Design for the Real World* with the statement 'There are professions more harmful than industrial design, but only a very few of them'

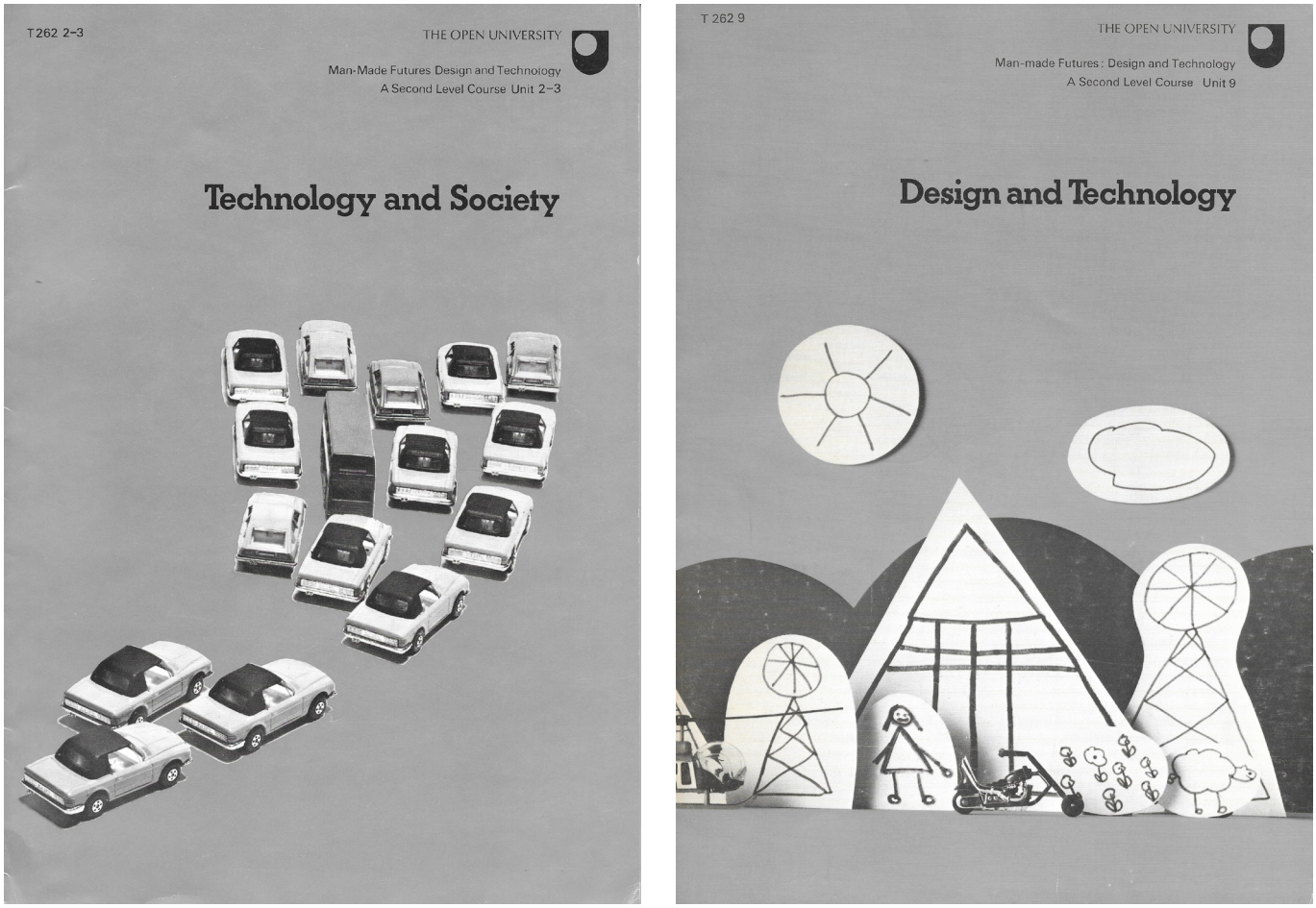


Figure 10.1: Covers from two of the main text units in the *Man-Made Futures* course (1975). The course treated design within broad social and technological contexts. Image credit: The Open University

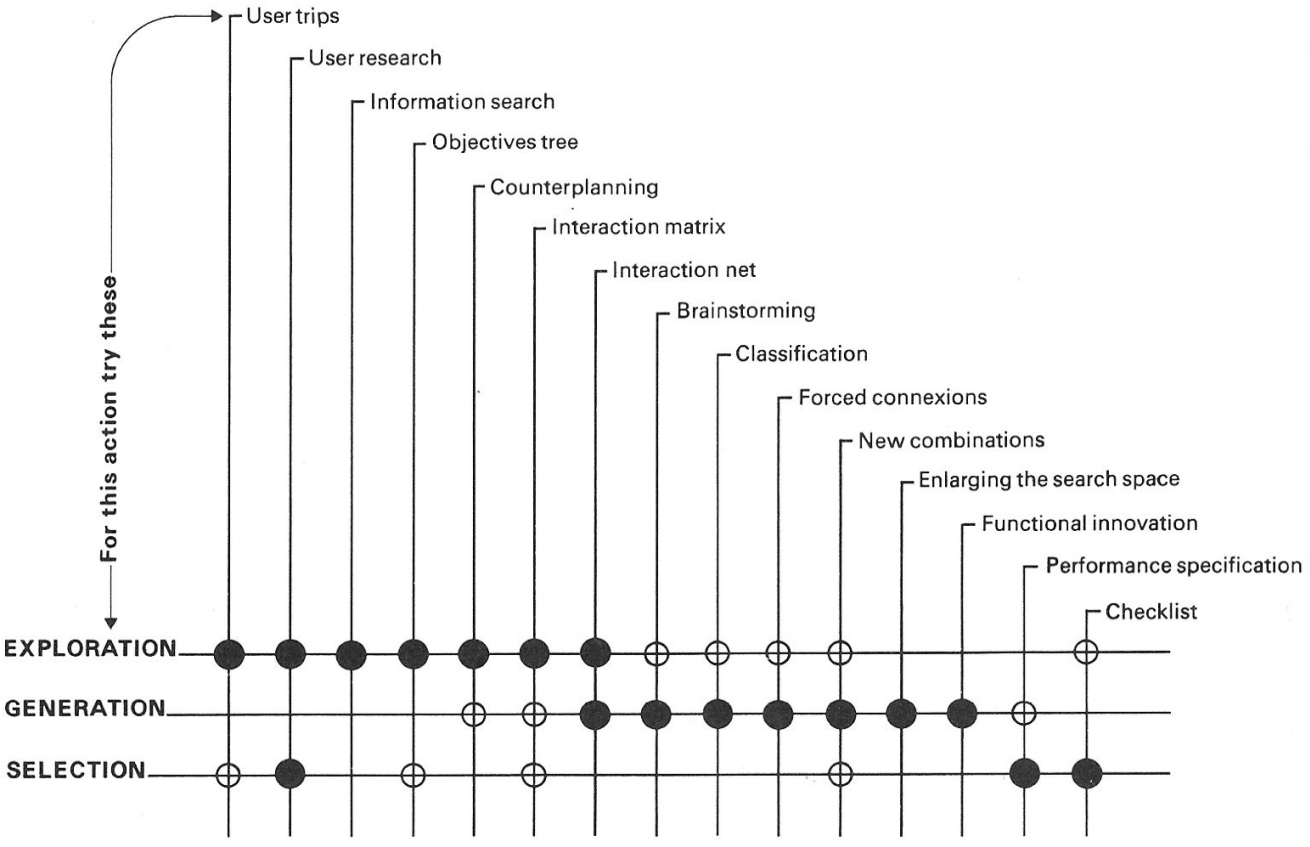


Figure 10.2: A student guidance chart in the *Design Methods Manual*, suggesting how individual methods match with the project stage they may be at: exploring problems, generating solutions, or selecting an appropriate solution. Image credit: The Open University

(Papanek, 1972, Preface). He commented on design education that:

> The main trouble with design schools seems to be that they teach too much design and not enough about the social, economic and political environment in which design takes place.
>
> (Papanek, 1972, p.291)

Whereas studio teaching in a conventional design school allows the gradual and often tacit transmission of approach and technique between the expert (tutor) and the apprentice (student), in the distance learning situation there is a need for explicit articulation of approach. Design education 'in the open' necessarily means a transparent approach to teaching and learning. As part of this transparency, the use of systematic design methods (which had only begun to appear in the 1960s) alongside creative thinking methods was seen as a key to design education in the OU. The printed materials for *Man-made Futures* included a 'Design Methods Manual' (Cross and Roy, 1975) that set out a taxonomy of methods, with descriptions and examples of each, so that students could choose appropriate methods to advance their own, self-chosen design project (Figure 10.2). Another 'Methods Manual' (Cross, 1978) for social and environmental assessment of technology was used in the subsequent third-level module, *Control of Technology*, first presented in 1978. The module title reflected issues of the time and the teaching materials were based on a critical but creative attitude towards technological change.

These manuals presented a variety of methods in 'teach-yourself' formats rather than teaching a specific, set design process. The idea was that – as with other kinds of reference manuals – the student looked up and learned a method, as and when it was relevant to their project work. The use of such a repertoire of methods has continued, in various forms, up to the present day with students on the current Stage 3 module *Innovation: Designing for change* now using an online 'Project Toolkit', which is a repository of design techniques and methods.

Figure 10.3: The Problem Identification Game (PIG), developed for the exploration of self-identified problems at the start of a student project, included game elements such as a board, cards and a die to introduce chance elements into a structured approach to problem clarification. Image credit: The Open University

The skills of problem identification and framing, now regarded as central features of design thinking, were seen as key skills within an open, self-directed version of design education. An early example of materials designed to assist students in the development of these skills was a game sent to students for use in the *Man-made Futures* module. The game-like format for the Problem Identification Game (PIG) was designed to make a conceptually complex task do-able by a novice design student (Figure 10.3). Although it was game-like, with a board, cards and a die, it offered a structured approach to formulating a clear problem statement from within a messy problematic area. Through the refining of problem statements, a student arrived at a starting point for their own self-identified design project, rather than a conventional design project 'brief' prescribed by a tutor.

Innovatory use of TV programmes also featured in the Man-made Futures module to support the pedagogical aims of transparency, self-directed learning and reflexivity. For example, one programme demonstrated the approach to playing PIG and the kind of creative, relaxed attitude of mind that was necessary to its success. In a programme on 'Design Strategies' Nigel Cross demonstrated the skills of using design methods, taking the design of the programme itself as the self-referential topic. That is, he applied design methods to the problem of designing a TV programme on design skills and strategies, demonstrated his own use of the methods, compared strategic analogies for designing, and in these ways articulated and demonstrated design skill to the students (Figure 10.4). An extract from the 1975 'Design Strategies' TV programme can be viewed at **https://www.open.ac.uk/library/digital-archive/clip/clip:T262_09_01**

Other programmes included documentary films of an alternative technology commune in Wales and a participatory housing renewal project in London. The uses of television were thus based on the medium's strengths in conveying values and demonstrating skills, whereas the use of text was based on its strengths in transmitting knowledge – a differentiated approach to media use that was outlined later by Cross in an article on 'The Nature and Nurture of Design Ability' (Cross, 1990).

Figure 10.4: Lecturer Nigel Cross compares designing to some aspects of a game of football, in a 1975 TV programme on design methods, skills and strategies. Image credit: The Open University

One of the key principles underpinning OU design teaching has been to seek ways to enable experiential learning. In early work this was most fully embodied in the second OU Design module, *Art and Environment* (first presented in 1976), an inter-Faculty experimental course in art and design. This module opened with the theme of 'Having ideas by handling materials', setting a focus for the students on doing and making art, however unconventional, rather than on art products. The module also introduced other themes that were unusual in art and design education at that time, such as feminism, ambient soundscapes and dance. It promoted experiential learning through the use of a 'home kit'. Such kits, mailed to students, contained special returnable items specific to the module and also a mix of consumable materials that might be difficult for those OU students in remote locations to access. Consumables provided for design students included drawing papers and tools, samples of materials and other items to be used for exploration, experimentation and modelling. The *Art and Environment* module also had a summer school, which gained some public notoriety for the performance-art projects that students produced, and sometimes exhibited on the streets of the towns of the school's host universities.

The early OU Design modules also took the pioneering approach of articulating the need for user-centred and participatory design, which were concepts that had begun to emerge in the 1960s. Teaching topics were therefore based on the design of everyday products, on social responsibility and sustainability, and universal inclusive design made for and by everyone. Much of the teaching took the user's point of view, for example in evaluating products for their fitness for use, rather than the professional designer's point of view of them as cultural artefacts that predominated in conventional design education.

Through experimentation and reflection, design education in the Open University began to develop a more confident approach to learning that was not only *about* the principles of design but also included learning the practices of *doing* design, as well as introducing forms of education *through* design (Garner, 2005).

Developments in delivery methods

From 1972 through to 2010 core teaching was primarily delivered through well-illustrated books written by the academic staff in a one-to-one teaching style, addressing the student directly, and published by the OU. However, the use of image and media has always been seen as crucial in providing additional materials and recognised as being particularly important for students who may be remotely located or isolated. These other media have always been an important part of the learning strategy and, as technology has developed, the way in which media are used has developed concomitantly.

Initially, teaching texts were supported and supplemented by special television and radio broadcasts, made by the BBC. Broadcast media required the student to rise early or stay up late to view or listen to the programmes during the scheduled OU broadcast times, using accompanying texts that gave a synopsis of the content and provided some further illustrations and study notes. Most programmes were filmed in the studio and were didactic in nature. The Open University still commissions and collaborates with the BBC on broadcast television and radio programmes, although these newer 'flagship' broadcasts are no longer tied to specific teaching modules but rather encompass larger themes such as design and engineering or society and the environment. Some examples with OU design academics acting as consultants include 'The Secret Life of Buildings' (broadcast 2011) and 'The Fifteen Billion Pound Railway' (broadcast 2014, 2017, 2019).

The advent of digital media in the 1980s had a significant impact on teaching delivery and pedagogy. During the transition period from printed and broadcast forms of delivery to the use of the Internet, digital media on disc played a role in preparing the ground. The first impact of digital media was on audio-visual materials, which changed significantly in the mid 1990s as the widespread availability of CD, and later DVD players led to a switch from the use of pre-recorded videos and cassettes to the use of the digital medium.

Digitally recorded media not only enabled the student to view or listen to materials in their own time but also enabled a new approach to be developed towards the navigation, content and presentation of materials, facilitating a more experiential approach to the resources rather than the formal, linear approach that had been the norm imposed by broadcast and taped materials. Presenting teaching resources on DVDs had a profound impact on the way in which students engaged with the materials and heralded the use of the Internet, for example through a navigation system that linked to the audio-visual resources, software and interactive activities contained on the disc. The video materials presented on the DVDs broke with established broadcast programme format, offering short pieces arranged to enable the student to explore case studies according to their own interests. The software supported various aspects of designing, and the interactive exercises were employed to teach

techniques such as creative thinking. The DVDs also contained templates and guidance on aspects of design work, effectively grouping all non-print resources into one place for easy access by the student.

A further turning point in student and staff communication came when domestic use of the Internet became more pervasive. In the 1990s, a client-server piece of software, FirstClass, was introduced into the university and used for email, forums and online conferencing for both students and staff. The FirstClass system was in use for design teaching through to 2009 when the advent of a standardised Moodle Virtual Learning Environment (VLE) meant a changeover to an integrated platform in which email and forum facilities were incorporated. The FirstClass forums made dialogue between students and their tutors possible but, for the first time, the VLE enabled direct online contact between students, and with academic staff.

Teaching online

The launch of the Open University's bespoke Virtual Learning Environment (VLE) in 2010 marked a major shift in delivery methods, enabling access from any Internet connected device. This advance in the use of technological media led to new delivery paradigms for OU modules. Some blended approaches combining VLE and traditional delivery by text, while others seized the opportunity for the entirely online presentation of teaching materials.

For example, the Stage 2 module *Design Essentials*, adopted a blended approach using print with VLE support. This module lays down many of the fundamental principles of design and has remained primarily in print because the highly illustrated teaching material contains knowledge and exemplars that students can refer to as they progress through their degree. However, the Stage 1 Design module *Design Thinking*, launched in 2010, was among the first in the university to be conceived and created primarily for learning online, marking a significant development in open design education. This was followed in 2014 by the Stage 3 module *Innovation: Designing for change*.

For the Stage 1 and 3 modules, all of the teaching content is delivered online, with audio and video materials integrated into the teaching text. Access to resources, assessment materials and forums is also through the interface, bringing everything together in one site. All content can be retrieved via mobile devices, as well as computers, enabling students to make use of materials wherever they have Internet connection. It is also possible to download offline versions of some of these materials which is important for some students with limited Internet connectivity. Creating materials for online learning requires a different approach to creating for print or blended learning, and this is a skill that academics have had to develop. The advantage of the online interface is that everything needed for study can be integrated into one learning space. However, text needs to be clear, succinct and broken into manageable pieces of learning, because students relate to online information differently than to printed text, as has been found in student feedback on their module experiences.

The approach adopted for the online environment to teach design at the OU gave special consideration to finding ways to stimulate the development of an online community and create pieces of active learning that had some familiarity to the student, such as polls and interactive animations. However, in designing the early parts of *Design Thinking* the module team identified the need to prime or 'kick-start' the community, as recognised previously by Frank, Kurtz & Levin (2002) and Schadewitz (2009). Kickstarting is seen to be a helpful step in bringing together students from diverse backgrounds and locations. To this end, and to engender engagement and offer a talking point for the community, it was felt that students needed a tangible introduction to the ethos and approach of the teaching. Thus, all students starting *Design Thinking* receive a Welcome Pack, redolent of the home kit for the early *Art and Environment* module. The pack contains various items, which are used to undertake a suite of interesting and creative activities. These items are mainly everyday things: masking tape, a pencil, ruler, paper bag, postcards, a T-shirt and T-shirt transfer paper, and a set of specially designed cards. All items are labelled and presented in a specially designed box to excite the students and to encourage them to look at the mundane in new and interesting ways befitting a student design thinker. The pack is supported by an element on the VLE which sets different activities for each item within the Welcome Pack. Tasks include, for example, generating different uses for the paper bag, drawing a curve using the ruler, and making a 3-D object from masking tape. The excitement generated around the welcome pack stimulates students to engage with one another in the online forums and to post images in the virtual design studio (discussed below). The associate lecturers also offer an introductory day-school which focuses on fun, collaborative, activities to aid the development of community among the students attending.

OpenDesignStudio

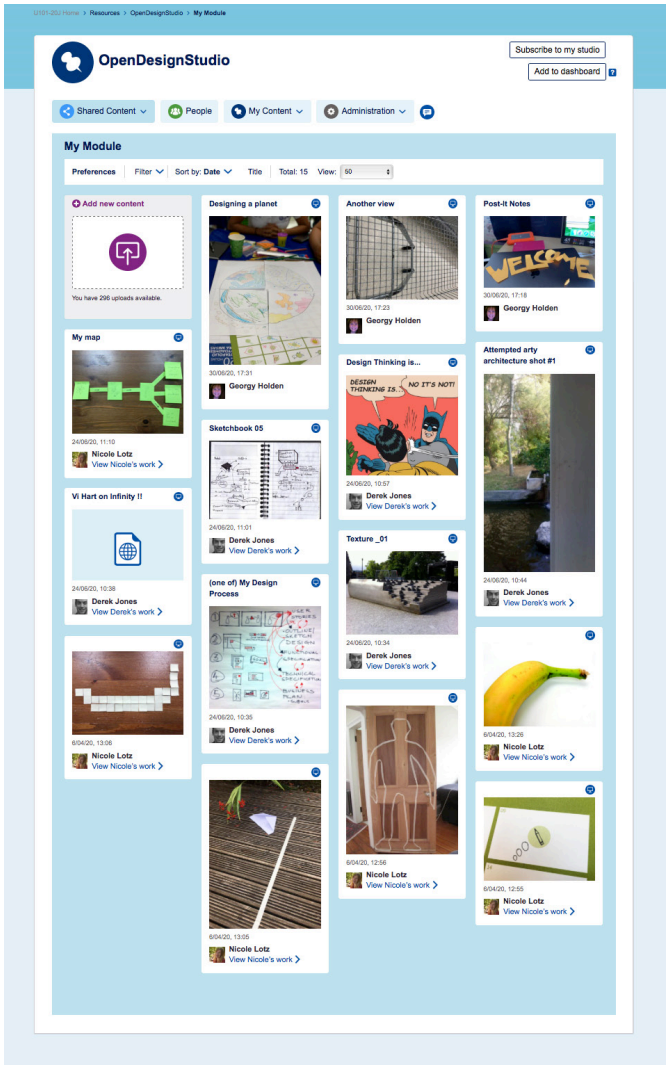
The VLE also offered the opportunity to adopt some features of the paradigm of studio or atelier teaching

and to adapt it to online educational provision. A valuable feature of studio-based education is the sense of community it engenders, with students able to discuss, compare and contribute to each other's ongoing work.

Significantly, therefore, a major benefit of the online environment for distance design education is that it opened up new potential for communication and collaboration between remotely located students. Thus, the Stage 1 *Design Thinking* module team took up an interface previously created for a short module in *Digital Photography* and developed it into a more sophisticated virtual environment called OpenDesignStudio (ODS). This environment was designed to facilitate design teaching and to provide additional motivation to help students overcome the challenges that they face as remote learners. ODS functions as a protected online space in which students can present and share their work as they progress through their modules. It has a superficial resemblance, in many respects, to social media interfaces such as Pinterest and Flickr but enables students to communicate in their tutor groups as well as with the whole module. An advantage of ODS is that it allows the upload of a wide range of file types including video, audio, pdf, Internet links, webcam footage and documents in addition to image files (Figures 10.5 and Figure 10.6).

ODS also encourages the student to curate their own work and select what they choose to share, and this act of curation develops the learner's ability to reflect upon and critique their own and others' work. Students may comment on each other's individual posts or, where they exist, sets (groups of uploads on the same topic). Students requiring help or feedback may flag their post as needing this, to draw the attention

(a)



(b)

Figure 10.5: Two views of ODS. (a) The collective module view. (b) Set activity slots ready to be populated. Image credit: The Open University

of peers and/or tutors. It has even become possible to present an annual show of student work, as is common in conventional design education (DesignExhibition, 2020).

In some senses, it seems we may have come full circle. In the early years of the OU, specialised studio pedagogy was seen as problematic and inappropriate for the implementation of an open design education, requiring the development of a new pedagogy. That development led to new interpretations of the nature of design and design education, which fed back into and impacted on conventional pedagogy, changing the field of design education. Re-evaluating the field, the studio model of teaching and the signature pedagogy of design education, still has a significant contribution to make, and this was a key factor behind the development of OpenDesignStudio. The physical design studio has traditionally been a place where not only operational learning and skills development takes place, but also where tacit transmission of beliefs, values and attitudes occurs. However, the design studio has changed radically in both education and practice, due to the influence of computer-based designing and communicating (Crowther, 2013). Today's digital design studio is very different to the classic drawing-board version. Increasingly, with the expansion of the HE sector, conventional design education has also embraced many aspects of open and distance education, expanding its range of student entry, broadening its subject coverage, and conducting seminars and group work with remotely located students. Over the years, therefore, versions of conventional and open design education have begun to blend together, with conventional design education adopting many of the innovations pioneered in design education at the OU and online provision now making the adoption of studio-based approaches available to online learners.

The wider impact of design education in the Open

Many of the techniques and methods that were pioneered in OU design teaching have since become regular aspects of contemporary professional design

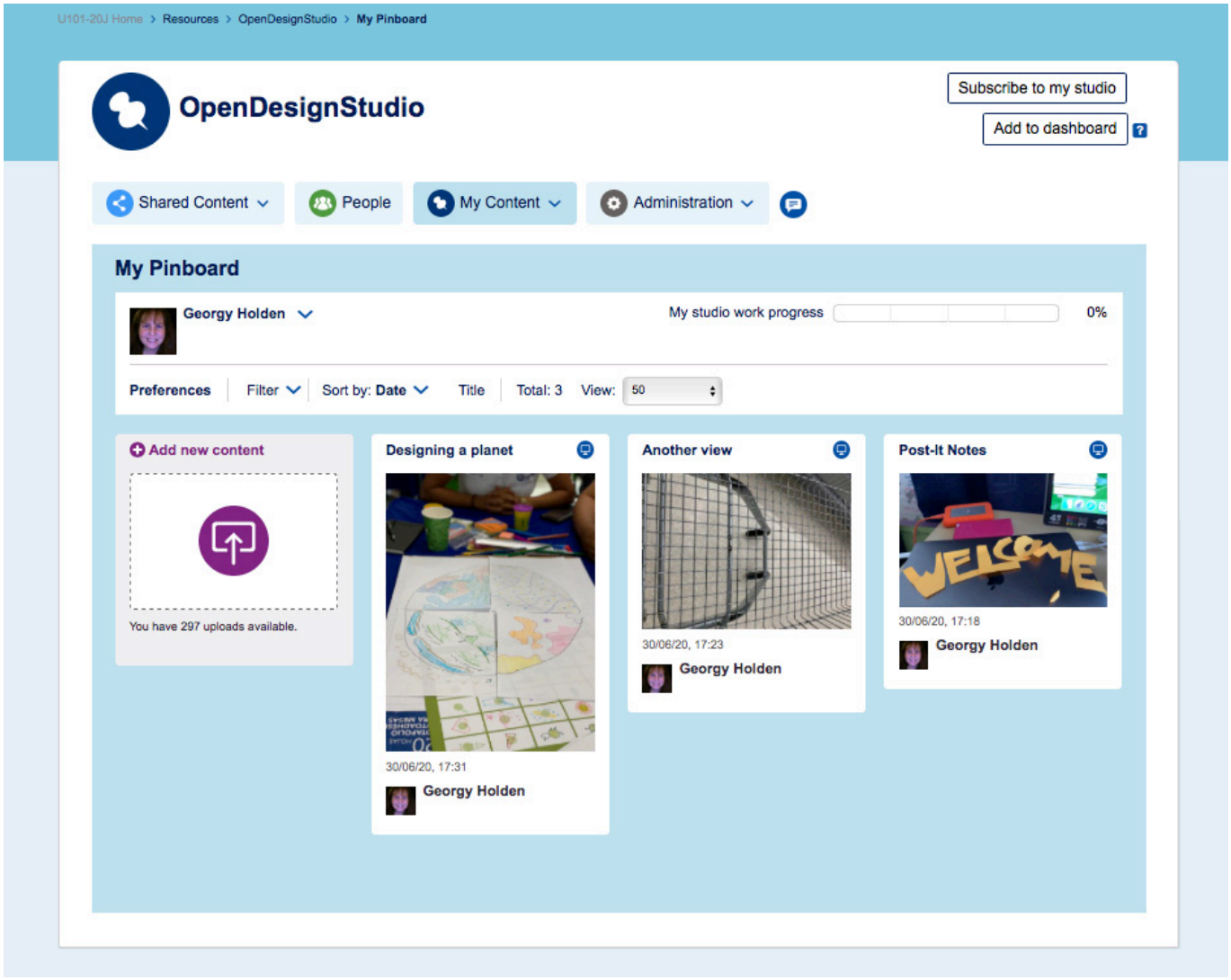


Figure 10.6: An ODS student pinboard for items of interest outside of set activities. Image credit: The Open University

education and practice. This influence has been partly due to the public availability of OU teaching materials, but publications in the design literature by OU design academics have also shaped thinking and discussion about the nature of design practice, research and education over five decades.

The first Professor of Design appointed to the OU in 1970 was J. Christopher Jones, who had just published his influential book *Design Methods: Seeds of Human Futures* (Jones, 1970), which not only presented new approaches to designing but also re-cast design within a broad, socio-technical systems context. He identified the new approaches and methods as having the characteristic of externalising and formalising the thinking that traditionally tended to go on inside designers' heads, and in their preliminary design sketching. These methods not only became adopted in design practice but also meant that learning design could become a more open and transparent process than had hitherto been the case.

An open design education also implied a shift in focus away from instrumental aims of vocational education towards the intrinsic values of learning how to design, such as appropriate forms of cognitive development, non-verbal thought, physical modelling, and skills for resolving ill-defined problems. Nigel Cross has noted that the early OU Design academics were faced with having to establish design as an academic discipline, rather than, or as well as, a professional practice (Cross, 2018). At the beginning of the 1980s Cross (1982) outlined a first view of design as a discipline, based on principles of general education and on research into the activity of designing that was beginning to accumulate at that time. Cross framed this view of design as a discipline based on 'designerly ways of knowing' – a view that became adopted throughout higher education in design:

> Just as the other intellectual cultures in the sciences and the arts concentrate on the underlying forms of knowledge peculiar to the scientist or the artist, so we must concentrate on the 'designerly' ways of knowing, thinking and acting.
>
> (Cross, 2001, p.55)

Early work at the OU by Jones, Cross and others was fundamental in identifying and developing key characteristics of design thinking, long before this concept became more widely adopted and promoted in the 2000s. It has spread into current conceptions of design thinking as a general approach to innovation, applicable across other domains such as education and business, and in the resolution of socio-technical issues.

Conclusion

In the twenty-first century, when the Internet and digital technologies are pervasive, we might easily forget that the delivery of teaching and learning over distance was a system that, in the early 1970s, needed to be invented. The idea that people could be taught how to develop skills as a designer without a physically located design studio was thought impossible. The identification of a subject area and articulation of design as an activity relevant and accessible to everyone, which has shared skills and capabilities in common across the domains of different design fields, was not only novel but also challenging to established subjects and professional practice. That design thinking could be applied broadly across areas of social and technological change was almost unconceivable. Those were some of the challenges that have been addressed and the opportunities that have been taken in the development of design education in the Open University. Grounded in a constructively critical approach to socio-technical innovation, and a synergy between pedagogy and research, it led to the development of design thinking and made a major contribution to how design education is currently practised in the wider field.

Bibliography

1 Archer, L.B. (1979) *Design in General Education*, London, Royal College of Art.

2 Crickmay, C. and Jones, J.C. (1972) *Imagination and Method: Designing as a Response to Life as a Whole*, Milton Keynes, The Open University.

3 Cross, N. (1979) 'Design education for laypeople', *Studies in Design Education*, vol.11, no.2, pp.68–72.

4 Cross, N. (1982) 'Designerly ways of knowing', *Design Studies*, vol.3, no.4, pp.221–7.

5 Cross, N. (1990) 'The nature and nurture of design ability', *Design Studies*, vol.11, no.3, pp.127–40.

6 Cross, N. (2001) 'Designerly ways of knowing: Design discipline versus design science', *Design Issues*, vol.17, no.3, pp.49–55.

7 Cross, N. (2011) *Design Thinking: Understanding How Designers Think and Work*, London, Bloomsbury.

8 Cross, N. (2018) 'Developing design as a discipline', *Journal of Engineering Design*, vol.29, no.12, pp.691–708.

9 Cross, N., Elliott, D. and Roy, R. (eds) (1974) *Man-Made Futures: Readings in Society, Technology and Design,* London, Hutchinson Educational.

10 Cross, N. and Roy, R. (1975) *Design Methods Manual*, Milton Keynes, The Open University.

11 Cross, N. (1978) *Methods Manual*, Milton Keynes, The Open University.

12 Crowther, P. (2013) 'Understanding the signature pedagogy of the design studio and the opportunities for its technological enhancement', *Journal of Learning Design*, vol.6, no.3, pp.18–28.

13 DesignExhibition (2020), https://www.behance.net/designexhibition2020, accessed 30.07.2020.

14 Dickson D. (1974) *Alternative Technology and the Politics of Technical Change*, London, Fontana.

15 Frank, M., Kurtz, G. and Levin, N. (2002) 'Implications of presenting pre-university courses using the blended e-learning approach', *Educational Technology and Society,* vol. 5, no. 4, pp.137-47.

16 Garner, S. (2005) 'Revealing design complexity: Lessons from the Open University', *CoDesign*, vol.1, no.4, pp.267–76.

17 Hart, J., Zamenopoulos, T. and Garner, S. (2011) 'The learningscape of a virtual design atelier', *Compass: The Journal of Learning and Teaching at the University of Greenwich*, vol.2, no.3, https://journals.gre.ac.uk/index.php/compass/article/view/45, accessed 19.7.2020.

18 Jones, D., Lotz, N. and Holden, G. (2020) 'A longitudinal study of virtual design studio (VDS) use in STEM distance design education', *International Journal of Technology and Design Education*, https://link.springer.com/article/10.1007%2Fs10798-020-09576-z, accessed 19.7.2020.

19 Jones, J.C. (1970) *Design Methods: Seeds of Human Futures*, Chichester, Wiley.

20 Lloyd, P. and Jones, D. (2013) 'Everyday creativity in design process', *Art, Design and Communication in Higher Education*, vol.12, no.2, pp.245–63.

21 McLuhan, M. (1964) *Understanding Media: The Extensions of Man*, London, Routledge and Keegan Paul.

22 Papanek, V. (1972) *Design for the Real World*, London, Thames and Hudson.

23 Roy, R. (1993) 'Case studies of creativity in innovative product development', *Design Studies,* vol.14, no.4, pp.423–43.

24 Schadewitz, N. (2009) 'Design patterns for cross-cultural collaboration', *International Journal of Design*, vol.3, no.3, pp.37–53.

25 Shulman, L. S. (2005) 'Signature pedagogies in the professions', *Daedalus*, vol.134, no.3, pp.52–9.