The Application of Computer Technology on Art Design Teaching

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Objectives: With the rapid development of digital technology in the new century, modern techniques which support teaching have been widely used. Methods: The educational landscape has undergone great changes in the input of digital technology. Results:In this paper, starting from the orientation of computer technology in art design teaching, computer digital network learning platform technology was adopted, teaching theory and teaching methods of computer-aided art were studied, the basic function and teaching method of art education in digital network learning platform were expounded. Conclusion: The final research shows that the new model will apply the advantage of computer technology to the education of art class, which promotes the good and orderly development of art education and improves the professional education level of art educators and learners.

With the development of electronic computer technology, a new subject based on the application of computer technology - "computer art design" was born. The emergence of interdisciplinary that combines computer operation technology with traditional art creation skills is not only the inevitable development of science and technology, but also meets the needs of the development of network, media, and television art [1]. But the main courses tend to electronic tutorials, picture display and a small amount of courseware, and emphasize the application and storage of teaching materials. Construction of learning environment based on computer network and the development and implementation of learning styles and other forms have not been paid attention to [2]. It can be said that the art teaching model centering on educators and teaching in one direction is still the mainstream, which can give full play to the network model of computer teaching platform and develop individual training for learners. However, at present, there is no real independent, research-based and interactive professional learning method [3]. Generally speaking, the teaching environment of computer digital network learning platform is more suitable for research study, the computer digital network learning platform has the characteristics of independence, interaction and exploration [4]. The rapid transmission, instant interaction, resource sharing and global synchronization of computer digital network technology have not been fully developed yet. The computer digital network learning platform will provide support for research study and provide sufficient theoretical and practical environment for the study of computer-aided art teaching.

Computer digital technology drives the emergence and development of new media art. According to the advanced technical strength and strong economic strength, the developed countries such as the United States and Britain have established network resources with complete infrastructure, and the United States typically has a "global information network", the United Kingdom has built up the typical national characteristics of the "British national network". The implementation of the national grid strategy with complete facilities and high efficiency has built a high quality platform for the operation of computer assisted art education network resource, and created favorable conditions for the informatization transformation of art education [5]. Due to the limitations of the domestic network construction technology crowd, domestic research mainly involves the collection and utilization of network information resources, the application of online education, the design and appreciation of network art and so on. The research and application of the network education resources in the specific art field has not involved [6]. China art education resource network is a relatively large website in China, which has a lot of art education materials, and the content involves: art education digest, art teaching courseware, art lesson plans, art teaching videos, art contribution zone, interactive forums and so on. Content is detailed, rich and colorful, with wide range. In addition, many domestic educators have joined the ranks of educational information research, and people gradually recognized the flexibility and effectiveness of online learning, and more educators have increased their application of learning strategies based on computer network technology [7].

METHODS

Research on Computer Assisted Art Teaching Model

The emergence of computer-aided technology has played an irreplaceable supportive role in the study of art education. The importance of support is reflected in the art resources, digital software and digital network sharing platform and so on, which creates the best learning environment for art teaching activities. Based on the results of theoretical research on computer assisted art teaching, this chapter expounds the teaching model of inquiry learning based on computer aided art from the teaching mode of research study.

According to the traditional educational thought and the law of education, the teaching mode of traditional art is "mentoring system" [8]. According to the form of teaching embodied in the "mentoring system" teaching model, it can be summed up: Educators pass on the art professional knowledge - to give students the fine arts general education; Educator art painting design demonstration - to give learners the creation of creative law; Educators art majors assignments instruction - to give learners art painting skills training; Educators art works appreciation - to give learners cultivation of artistic aesthetic accomplishment, these four parts constitute a "dual structure" teaching mode (as shown in Fig.1).

Figure 1
Binary Structure Type Teaching Model
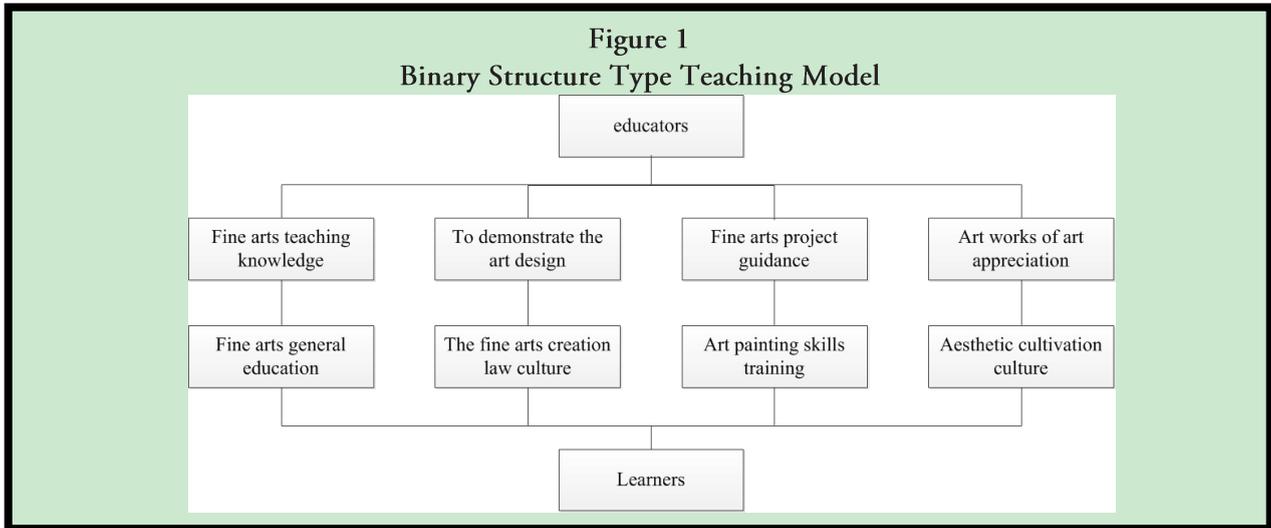
Art educators and learners participate in the whole stage of learning activities from beginning to end, educators and learners are the relationship between "master and apprentice", which are unequal in relation to the study of learning. The unfolding and analysis of the subject knowledge of art is centered educators, and the learners should carry out the art creation research activities under the teachings of the educators [9]. Educators may need to re-analyze the creation of art research, and obtain the latest guidance information to promote the creative level of learners. The whole process of the teaching of traditional fine arts embodies the same strain and supports each other, and there is no isolated link between them.

The teaching process of "multi-structure" teaching mode is relatively complex, which can be divided into several stages: the stage of project creation; the stage of project establishment; the stage of project research development, the stage of project analysis and discussion, the stage of project achievement evaluation and research release (as shown in Fig.2).

Figure 2
Teaching Process of Multiple Structural Teaching Model
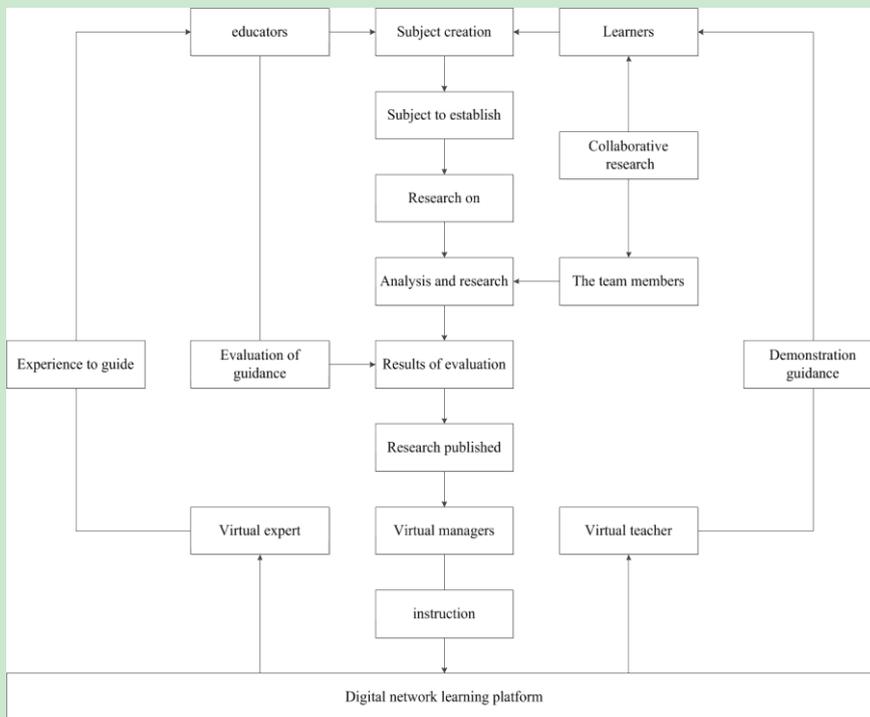
In the five stages of the "multidimensional structure" teaching model learning activities, educators and the learners are equal in learning and research from the beginning to the end. According to the advantages of the computer network, the educators form the source of the diversification of the knowledge of the subject and carry out the creation of the subject, and provide the specific content of the project of the learner's art research. The "multi structure" teaching model of computer digital features provides learners with a dual identity of learning subject and guided learning [10]. Learners get real-time demonstration of virtual teachers through the digital network learning platform; with the help of team cooperation discussion method and the continuous evaluation and guidance of educators, and the use of a large number of sharing curriculum resources in learning platform, learners complete research projects, learn about people, and share published research results. The computer virtual administrator carries out the unified management of the instruction issued by the digital network learning platform, and the instruction virtual expert provides the teaching experience for the educators, and forms the sustainable development fine arts teaching pattern. In addition, the "multidimensional structure" teaching model provides learners and educators with the status of equal speech, and establishes the principle of fair and equitable learning environment, which stimulates the potential of art learners and promotes the progressive development of art education.

In addition, the computer digital three-dimensional software technology is also the main part of the computer-aided composition basic teaching, digital three-dimensional software automatically generated drawing instead of artificial composition drawing, which enriches the

teaching content of the basic composition of art, forms a new way of training the composition of basic teaching [11].

Figure 3
Computer Aided Art Composition Drawing Effect

The computer-aided art composition drawing technique transforms the teaching idea of the basic course of art composition, and the course teaching is changed from focusing on the performance of the perspective and the specification drawing to the space shaping and the spatial simulation. The computer technology involved includes Sketchup, 3DMAX, MAYA, AUTOCAD and other software technologies. The digital network learning platform database stores a variety of model data, which can be used for the creation of learners' subjects, and is beneficial to the improvement of learners' self-leading learning quality. Educators provide software tutorials to assist learners with the ability to edit computer graphics as quickly as possible, giving them more evaluations and directing creative activities. Computer aided art composition drawing technology conforms to the development needs of the basic course of art teaching composition, and forms a new pattern of digital art teaching.

The Realization of Computer Aided Art Teaching Mode

The computer aided art teaching mode utilizes the form of art education in the modern new environment, and conforms to the current trend of the digital age, which gives a beneficial attempt to the change and improvement of the traditional art teaching. Computer aided art teaching model pays close attention to the individual differences of learners, uses advanced educational ideas and teaching methods to give learners a full range of educational care, it can be said that this is a bold new attempt to teach ideas and methods [12].

ASP.NET is a program architecture built on a common language that can be used to build a powerful Web application on a Web server. ASP.net offers many powerful advantages over today's Web development models. It is a unified Web development platform that provides the services that developers need to quickly generate enterprise Web applications. The teaching platform uses the SQL 2015 database to store the data [13]. The functions provided by the system for

educators include the entry, modification, and deletion of data. In the process of running the system, the system automatically retrieves data from the database for students to browse, and some of the data tables in the database are as follows.

Table 1
Online Consultation Information Table

Field name	Field type	Length	Primary key	Allow empty	Function description
UserID	Varchar	20	yes	no	User number
UserName	Varchar	20	no	no	User name
UsetPwd	Varchar	20	no	no	User password
UserPower	Int	4	no	no	User rights

In this system, streaming media technology is widely used. The current streaming media technology includes Microsof's Windows Media Technology technology, Apple's Quicklime technology, and Real Media technology in RealNetworks[14]. Because the server of this system adopts Windows 2005 Server, its internal has already included the whole stream media component with more tool, at the same time, it also integrates the streaming media browser in the Windows operating system. Therefore, the system mainly uses the Microsoft Windows Media Technology technology in the process of making.

The teaching of traditional teaching materials usually takes "chapters" lectures, students tend to focus only on software skills after learning, do not know how to use the skills to deal with the actual cases, lack of design ideas when doing projects. The use of "modular" knowledge teaching breaks the original chapter type teaching, optimizes the textbook knowledge, and introduces typical tasks in the enterprise into the classroom, adopts "work task modularization" knowledge teaching, and introduces training reasonably in teaching. The teaching thought of this kind of teaching method is clearer, and students are more purposeful after learning. In the study, the students learn the work of the enterprise tasks, such as DM single, CD packaging, posters and so on, which are familiar things in student life, and students are very easy to grasp. The following table is a modular teaching

form for the PHOTOSHOP course:

Table 2 Art Teaching Design				
Serial number	Unit (task module or training project)	Teaching content and requirements	Instructional design	Class arrangement
1	Photoshop basic knowledge	1. Understand the window composition 2. understand the basic function of the toolbar;	Combined with practical application to explain.	2
2	Basic graphics rendering	1. Familiar with the basic graphics tools of Photoshop 2. Use software to achieve the object of light and shade tone.	Learn the drawing principle of cone, sphere, cylinder and cube.	8
3	Combination of Photoshop and digital camera	Master the adjustment method of lightness of the photo, hue, saturation. 2. Master photo correction method.	To provide students with cameras, so that students deal with their own photos taken to improve interest in learning.	12
4	Layer function and use	1. Master the link, alignment, replication and other related operations of layer 2. Use layer blending mode, layer style for special effects.	1. Show students the application of layer blending mode and layer effects in graphic design; 2. Carry out phased training, and training content is advertising posters related topics.	12
5	Image processing automation	1. Master the basic functions and skills of the action panel 2. Learn how to rename serial pictures, modify image patterns, size, and so on by using the batch	Learn the content from the point of view of the job.	2

The author uses modular knowledge to explain, if the optimization of traditional teaching materi al is greater, the effect will be better. The improvement lies in that the current knowledge architecture is still relying on the traditional

teaching materials, for example, filters, channels, and other special effects have extensive explanations in traditional textbooks that emphasize software skills [15]. Because this knowledge is more colorful, it is easy to attract the attention of readers, but this knowledge is not used in practical use. The author thinks that since higher vocational colleges pay attention to practical knowledge, these can be explained along the way. In practice, people deal with images and word processing every day, which should spend more time to training, and help students lay a solid basic skill, and student with strong ability can study advanced knowledge such as filters,

passages, and so on.

RESULTS

Compared with the traditional art teaching model, the computer aided art teaching mode has the advantages of data retrieval and digital technology application support in the art project creation conditions. The author chose a university as a research object, and it is clear that there are significant differences by comparing the learning design time of the art project of the 2010 and 2016 students (as shown in Table 3).

Table 3
Comparative Table of Creation Time of Fine Arts

Reference majors, classes	Art and design in Grade 2010	Art and design in Grade 2016
Animation characters subject creation	20 hours	8 hours
Packaging project design	25 hours	9 hours
Pattern subject creation	18 hours	7 hours
Poster subject creation	23 hours	12 hours
Advertising topic creation	15 hours	6 hours
Logo project creation	24 hours	8 hours
Font project creation	12 hours	4 hours

Computer-aided art teaching mode has the same superiority to the artistic creation design effect. At present, although the digital network learning platform can't completely replace the form of classroom education, in the diversified knowledge system, the creative position of the learners, the educators and the guidance of the virtual participants have strong favorable creative conditions, which plays a key role in promoting the improvement of the artistic design.

Logo project creation of students in grade 2008 uses freehand drawing, the use of computer technology is not high, which is merely the storage function of the logo design work and is not heavily involved in the production (as shown in

Fig.4). The design effect of logo works of traditional freehand drawing is general and lacks the visual impact and the infectivity, the graphic color is single, the level change is little, this is the practical problem that traditional art teaching faces.

Figure 4
Works of Student Logo Works Creation of Art Design In Grade 2010
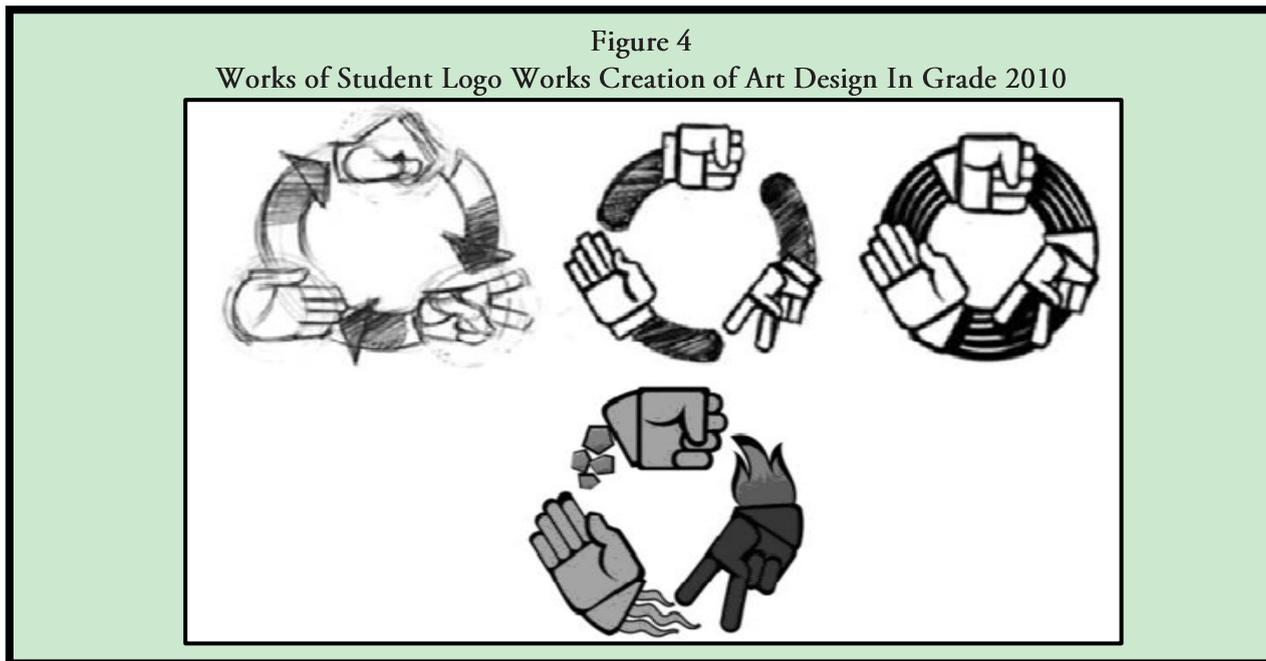
In the computer aided art teaching mode, logo project creation of the student groups of grade 2016 uses computer graphics technology to give full play to the advantages of network interactive communication in digital network learning platform, which greatly improves the students' writing ability and production ability. Taking the creation of the Tencent logo project as an example, 2016 students integrated the application capabilities of computer software, information collection capabilities of digital network, so as to reproduce the image of the Tencent Inc QQ Penguin (shown in Fig.5).

Figure 5
Mark Background Ball Using Digital Three-Dimensional Technology Creation
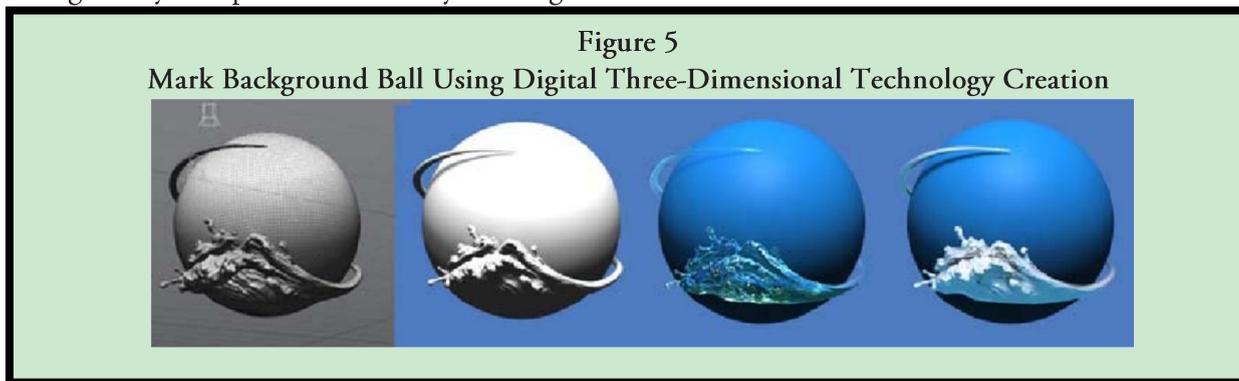
The art research project of computer-aided art teaching is based on practice. According to the actual needs of society, educators promote the direction and category of art project. These topics are not only in line with the purpose of the learner's research learning, but also to meet the creative ability and application ability of the art design practice of the learners, which has a high practical significance. The research-based learning of computer-assisted art teaching has stimulated the research model of learner team collaboration, which has led learners to actively discuss the project. Through the emergence and supplement

of the viewpoints, the learners can think deeply about the research value and significance of the project, so as to enhance the learners' interest in the project, which makes the learner transform the research project into a research motivation.

DISCUSSION

Under the background of the rapid development of contemporary science and technology, research learning based on the context of digital networks was preliminarily studied. Starting from the angle of integration of computer technology and research learning, based on construction and practical application of the digital network learning platform of computer assisted art teaching, the teaching model of art education under computer technology environment was discussed. According to the main points described, the following are summarized:

The purpose of studying computer assisted art digital network learning platform is to make an empirical study of the new model proposed in this paper, and to explore its scientific rationality and professionalism. The teaching mode of digital network learning platform gives a comprehensive and innovative change to the traditional art education model. The new mode promotes art education to cater to the changes of the information age, and changes the learning view of art educators and learners, and provides an alternative way of learning for the learners in the information age. Research study based on computer aided art teaching has gradually become the first choice of art education in colleges and universities, and has also been a powerful way of lifelong learning.

In this paper, there are still some shortcomings, for example, from a social point of view, the research has not been able to meet the needs of art business participants, so that further breakthroughs should be made in this respect.

Human Subjects Approval Statement

This paper did not include human subjects.

Conflict of Interest Disclosure Statement

None declared.

References

1. Breslin M, Buchanan R. On the case study method of research and teaching in design. *Design Issues,* 2008, 24(1): 36-40.
2. Crismond D P, Adams R S. The informed design teaching and learning matrix. *Journal of Engineering Education,* 2012, 101(4): 738-797.
3. Danvers J. Towards a radical pedagogy: Provisional notes on learning and teaching in art & design. *International Journal of Art & Design Education,* 2003, 22(1): 47-57.
4. De la Harpe B, Peterson J F. Through the learning and teaching looking glass: What do academics in art, design and architecture publish about most?. *Art, Design & Communication in Higher Education,* 2009, 7(3): 135-154.
5. Dym C L, Agogino A M, Eris O, et al. Engineering design thinking, teaching, and learning. *Journal of Engineering Education,* 2005, 94(1): 103-120.
6. Green L N, Bonollo E. Studio-based teaching: history and advantages in the teaching of design. *World Transactions on Eng. and Tech. Edu,* 2003, 2(2): 269-272.
7. Gül L F, Gu N, Williams A. Virtual worlds as a constructivist learning platform: evaluations of 3D virtual worlds on design teaching and learning. *Journal of Information Technology in Construction (ITcon),* 2008, 13(36): 578-593.
8. Hall J. Making art, teaching art, learning art: Exploring the concept of the artist teacher. *International Journal of Art & Design Education,* 2010, 29(2): 103-110.
9. Justice C, Rice J, Warry W, et al. Inquiry in higher education: Reflections and directions on course design and teaching methods. *Innovative Higher Education,* 2007, 31(4): 201-214.
10. Mun Ling L, Marton F. Towards a science of the art of teaching: Using variation theory as a guiding principle of pedagogical design. *International Journal for Lesson and Learning Studies,* 2011, 1(1): 7-22.
11. Parpala A, Lindblom-Ylänne S.University teachers'conceptions of good teaching in the units of high-quality education. *Studies in Educational Evaluation,*2007, 33(3): 355-370.
12. Pavlou V. Profiling primary school teachers in relation to art teaching. *International Journal of Art & Design Education,* 2004, 23(1): 35-47.
13. Percy C. Critical absence versus critical engagement. Problematics of the crit in design learning and teaching. Art, *Design & Communication in Higher Education,* 2004, 2(3): 143-154.

14. Seidel T, Shavelson R J. Teaching effectiveness research in the past decade: The role of theory and research design in disentangling meta-analysis results. *Review of educational research,* 2007, 77(4): 454-499.

15. Shreeve A, Sims E, Trowler P. 'A kind of exchange': learning from art and design teaching. *Higher Education Research & Development,* 2010, 29(2): 125-138.