SANAT EĞİTİMİNDE BİLGİSAYARLAR
COMPUTERS IN ART EDUCATION

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"Nothing in the last half century has affected our lives and the world we live in more than two inventions, the television and the computer. Computer graphics is the artful and scientific fusion of these two and a prism refracting new visions of the earth, our lives, our inventions, our imaginations. It is the image of the future today".

Joan Scott, 1984

ÖZ
Bu makalede bilgisayarların sanat eğitimindeki yeri ve önemi tartışılmıştır. Önce, bilgisayarla ilgili bazı temel terimler tanımlanmış ve sonra da okullardaki sanat eğitimi üzerinde durulmuştur. İngiliz okullarındaki Ulusal Müfredat Programlarında bilgisayarların (Bilgi Teknolojisi) yeri açıklanmış ve daha sonra da bilgisayarların sanat ve tasarım eğitiminde nasıl kullanıldığı tartışılmıştır.

ABSTRACT
In this article, the place and importance of computers is discussed. First some major terms related to computers are defined and later the importance of art education in schools emphasised. Then the place of computers (Information Technology) in the National Curriculum (NC) in England is explained and finally a discussion of how computers are used in art and design education is presented.

Introduction

All over the world, artists search for new art materials to express themselves. When looking at art history, we see that many new movements and innovations have influenced artists' work of arts. Of these technology is maybe the most powerful. Computers are technological masterpieces and, naturally, many artists use them as a new medium to convey their ideas, views and feelings. When compared to the traditional media such as paint, clay, or marble, computers have a relatively short history.

Children confront computers in their daily lives. Moreover, they are more aware of many of the computer art forms than their parents or teachers. When talking about computer art forms, we mean films, videos, games, video games, computer-generated images in television, advertisements, cartoons, music videos and so on. Moreover, a computer is more than just a tool, it offers many opportunities in art and design classes in schools.

This study will try to explore these opportunities given to the children in art education.

Understanding the Computer

In order to understand the nature of computer art, one needs to have some basic knowledge about computers. Therefore, the origin of the term 'computer', historical background, definitions, and main parts of the computer system will be briefly explained.

The Origin of the Term 'Computer'

According to Skull (1988) the word computer comes from the Latin 'computare' that means 'to calculate' or 'count'. An English mathematician Charles Babbage (1791-1871) is known as the father of computers. He invented the first electronic calculating and problem-solving machine in 1874. However, the first completely electronic computer called ENIAC (Electronic Numeral Integrator and Calculator) was created at the University of Pennsylvania in 1945. When looking at the background of computer development in England, it can be said that M. V. Wilkes was the first designer of an all-electric computer (Skull, 1988).

The Definitions of 'Computer'

Skull (1988) determines a computer as an electronic device that can store, retrieve and process data in accordance with a series of stored commands called a program. According to Mathieson (1993:22) 'A computer is a collection of different components which work together'. It can be said that the term computer describes a kind of system that saves, re-saves and processes data by means of used software. Mathieson (1993) mainly divides a computer device into two parts: hardware and software.

Hardware

Hardware is an Information Technology (IT) device that can be physically touched. It is the term used to depict the computer or processor, a floppy disk driver, a CD ROM driver, internal devices, generally a keyboard or mouse or both, external devices, a monitor or a screen, or monitor and a printer. Usually, this combination is called a computer system.

Software

Software, which provides data to run the system, drives the hardware of the computer. It tells the computer (processor) what to do and gives it instructions to follow. Software is usually known as a computer program. According to Mathieson (1993:24) 'Software is 'soft' because it is easily changed without affecting the hard wired circuits of the computer. It is loaded into the computer via the disc drive'.

Art Education in Schools

The arts constitute one of the major areas of human endeavour and achievement. They are firmly rooted in the aesthetic, representing a form of knowing which is pre-eminently to do with sensory awareness. A worthwhile arts education is rigorous and demanding as well as creatively satisfying and enjoyable (Taylor and Andrews, 1993).

There are several ways of defining the role of art education in schools. Lancaster (1990) combines these three aspects: which are art, craft and design together under the word of art. That includes a vast a range of art activity in the classroom (Meager, 1993). Clement and Page (1992: 10) additionally emphasise that art is one of the subjects in the education system concerned with visual, communication, aesthetic sensibility, sensory perception, emotional and intellectual development, physical competence and critical judgement.

Art has two specific roles in schools: Firstly, like other subjects such as Mathematics, Science, Geography, Art and Design has its own discipline and content, but it is used in conjunction with other subjects for project or topic work. In the teaching of Art and Design at Key Stage 1 (KS1), Key Stage 2 (KS2) and Key Stage 3 (KS3), the contribution that art makes to children's learning has to be both valued in its own right and used in the teaching of other subjects (Clement and Page, 1993). Secondly, it is also used as an education tool in cross-curricular teaching. It can be seen as a powerful contributor to other curriculum areas, not only Music and Design and Technology, but also to Humanities, Modern Languages, Mathematics, Science, Geography, History, Literacy and Physical Education.

Computers and Learning

'Children learn through active experience, organising, and expressing this experience through movement, sound, number, writing and speech and "visual language" ' (Herne, 1996:3).

It can be said that the computer is a novel medium, a novel tool to be used by artists of all ages. Furthermore, it is an exiting medium that can stimulate new ways of thinking, learning and creating art. The use of IT (Information Technology) can help and support a wide range of learning activities. Moreover, it may encourage these activities as a positive approach to dealing with mistakes and support the development of literacy and numeracy skills. Therefore, IT should be introduced to children as early as possible (NCET, 1996).

Children learn in different ways, one of them is personal experience. If they want to learn something new, firstly they have to know it by personal experience. These experiences might be constituted by touching, observing, or playing. For example, when we observe children, they quickly begin to experiment by moving into different parts of the program. This experimenting is essential for the learning process. Moreover children learn in groups as well as individually. It can be said that group learning is one of the most effective ways of learning. Computer assisted learning gives children these learning experiences.

As Burgess (1993:20) has indicated;

> "From the children's point of view the computer is a tool which can provide opportunities or potential for learning. It provides opportunities which challenge, motivate and provide enjoyment for some children. The computer may be a catalyst for pupil to pupil interaction provides common experiences for joint discussion and decision making".

The computer can provide an environment that gives interaction and feedback not provided by other materials. According to Burgess (1993: 21), through

this environment children can be encouraged to solve problems, respond to software commands and information when they learn to follow directions. They apply former knowledge to new conditions and understand causes and effects. Therefore, they develop their thinking skills whilst working co-operatively with peer and adult support. Such an environment can encourage children to operate a computer mouse, keyboard, put a disc into the computer and turn it on so they can develop coordination skills (Burgess, 1993).

Computers (Information Technology) in the National Curriculum in England

IT plays an important part in all areas of the National Curriculum, in raising standards and school effectiveness. Mathieson (1993) divides IT into two distinctive areas. Firstly, the development of IT is a necessary part of the curriculum in a technological world as computers are now part of our daily lives. Secondly, IT can be used to enhance the teaching and learning process in almost all subjects of the curriculum (Mathieson, 1993: 32).

Basically, it would be helpful to clarify the general aims of IT in the NC (National Curriculum) for all age stages (5-16 year olds). Hence, the role of IT in education can be seen in a broader context. According to HMI (1989) the aspects of IT within the NC can be summarised as follows: [cited in Griffin and Davies (1990)]

1. Pupils have the opportunity to use IT whenever its use is helpful to his/her task, for example, if they need to use word processors to develop their writing, compose a piece of music, etc.
2. Pupils use IT to enhance and enrich their learning in every area of the curriculum.
3. Pupils have the scope of their learning potential extended by the appropriate use of IT.
4. Pupils obtain IT capability. It is important to ensure that they have a clear understanding about the technological world, and to encourage them to have the adaptability and openness of mind to get advantage of technological developments.
5. Pupils have a coordinated and coherent program of relevant IT experiences.

Mathieson (1993: 33) describes five main strands for IT capability. These five main strands are the following:
- communicating ideas;
- handling information;
- modelling;
- measurement and control;
- application and effects.

These five strands are also indicated in the NC as the following statements:
- communicate and handle information,
- design, develop, explore and evaluate models of real or imaginary situations,
- measure and control physical variables and movement (Griffin and Davies, 1990: 257).

IT can be seen at almost all levels of schools. However, it is intended that design and technology will be taught as a separate subject in secondary schools. It incorporates the design and technology aspects of art, craft, design and technology. Therefore, IT mostly can be seen in Key Stage 2 and Key Stage 3 in the schools.

Art Education and Computers Capability

Art has to be concerned with children's creative, imaginative, practical and manipulative skills' development and their knowledge and understanding of the different areas. These areas are children's ideas, feelings and relationships with objects.

The use of IT in art, craft and design can help children of all abilities to develop, apply and consolidate skills, knowledge and understanding set out in both the art curriculum and IT curriculum. The NC for art requires that the children should be given the opportunities to apply and develop their information technology capability, where appropriate, in art, craft and design (Ghislaine, 1994; Herne, 1996; NCET, 1995; SCAA).

According to SCAA pupils' work in art, craft and design can be supported by using IT tools and techniques to:
- develop and extend pupils' practical skills;
- extend their knowledge and experience of the work of artists, craftspeople and designers from different times and places.

Mathieson (1993) divides art and design into two main strands that are communicating ideas and applications and effects. The major characteristics of these two strands are summarised in Table 1 below.

Using Computers in Art, Craft and Design Education

"Artists have always looked for new and exciting ways to produce images, pushing their materials and tools to the limits through imaginative and creative exploration. The use of computers alongside other traditional materials offers exciting potential for further creative developments" (Ghislaine, 1994:24).

IT capability can be considered in all subject areas in the curriculum. However, art, craft and design subjects can effectively contribute to capability in IT in a number of ways. IT can support and enhance pupils'

work in art, and develop the following aspects of IT capability which can be appropriately taught through art. According to SCAA using IT contributes to art, craft and design work:

- to extend the range of tools and techniques in art, craft and design;
- to provide a tool for transferring images to and from more traditional media, e.g. develop a cartoon for a gouache painting;
- to facilitate the process of developing ideas and documenting that process.

Table 1. A Summary of Main Strands of Art and Design

Communicating Ideas	Applications and Effects
• select items on a computer screen	• using a computer for tasks that can also be accomplished by other means
• use computer pictures to convey meaning	• describing their use of IT and comparing this with other methods of achieving the same result and deciding which was the most effective
• create a drawing on the computer screen and save it to disc	• discussing and reviewing their experience of IT and considering how IT is used in daily life.
• Use a drawing program to create an image and modify it	
• Produce computer images to present information in different forms such as producing a poster, book jacket design, and logo from the same image	
• To use IT to retrieve, develop, organise and present work.	

Adapted from Mathienson, 1993

The computer is a tool for learning according to the NC (Mathieson,1995). In art, craft and design classrooms, the computer is another tool for creating art as much as the other traditional media such as paint, crayon, pencil, chalk, etc. (Herne, 1996; Mathieson, 1995; Meager,1995; Morgan, 1993; Hurwitz and Day, 1991; and Greh, 1986). According to Hughes (1990:19) 'Computers are being used as another tool just like a potter's 'wheel' or a 'kiln'. The computer has its own qualities and characteristics that can be used for complex activities as well as simple activities in art sessions.

"Drawing with a computer is physically very different to drawing with conventional media in that the eye remains focused upon the screen while the hand draws independently with the mouse. This kind of focus can generate intense periods of concentration, even within the noise and bustle of a busy studio, which can be of considerable benefit to some children" (Clement, 1991:221). On the other hand, whatever the age of children this concentration is same for each of

them. Another motivated point is the usage of computers in painting or designing stages of art. Since it gives them the capability of erasing the mistakes, also correcting them and maintaining an almost perfect result for children, the children can make numerous different experiments on the screen without any fear of losing or damaging their work.

Using Drawing and Painting Software

Drawing and painting software consist of a drawing area, a number of drawing and painting tools, and a colour palette, with additional facilities for cutting, pasting, repeating, etc. Items can be chosen by moving a mouse that controls a floating pointer on the screen. By pointing at a particular tool and clicking the mouse the tool will be selected. When an image has been produced, it can be saved to disc. It is also possible to save a sequence of ideas. This is a way of documenting the history of an idea, thus a child can make a kind of sketchbook. In this sense, the computer could be described as an electronic sketchbook for making any possible changes. Images can be printed out or recalled at a later stage and developed in different ways (Morgan,1993).

In sum, the basic facilities of ordinary drawing and painting software are: a wide range of colour palette, different brush effects such as pencil, spray, watercolour, filling tool to give the different coloured backgrounds and further useful tools for arrangements like cut and paste, zoom, rotate and mirror.

A teacher needs to identify drawing and painting software that is suitable for the age range of his or her class. Herne (1996:27) gives some examples for these kinds of software. 'Nimbus computers' and 'Paint Pot' has two levels, one which only uses visual symbols and can be used from the nursery onwards. 'Paint Spa' is more suitable for older children with a wider range of tools, as is 'Drawmouse' that has some interesting pattern design facilities. All classroom computers should have appropriate programs. Moreover Allen (1994) introduces us to Tempra Vision, Draw to Learn, Coaster and Brushstrokes as some examples for drawing and painting software.

It seems that almost every day some new software takes its place in the computer market. Some of them are really worth using while others are a waste of money. Mathieson (1993) suggests criteria for choosing software that will be helpful to a confused teacher. The following questions may serve as a beneficial guide for choosing software:

1. Is the computer the most suitable medium for the art activities?
2. Is the software appropriate to the pupils' needs?
3. Is the software open-ended, allowing for the full

creative activities and development?

4. Is the software easy to use?
5. Is the screen presentation clear?
6. Will all pupils find it interesting?
7. Is the software content free?
8. Can different input devices be controlled by the program?

If the software will answer all these questions, it is good for art and design classes. However, before introducing it to the pupils, the teacher has to know all the facilities of the software.

Advantages of the Computer Art

It seems that the main advantage of computer art for first time learners is its experimentation facilities. Pupils can learn how to use computers, to explore line, colour, shape, space, pattern and texture whilst they try to create an image on the screen.

In art, craft and design classes, pupils often need to store information, restore, and transmit it. Computers have these kinds of facilities that allow pupils feel more comfortable. This is especially true for pupils who may be afraid of making mistakes in their work. Working with computers encourages pupils as well. If they make an error they can easily edit it or go back the previous screen. This gives them the confidence to experiment. The results are also more professional which pupils find very useful (Hughes,1990).

Correspondingly, pupils respond particularly well to the computer's capacity to erase quickly, correct mistakes and maintain an almost faultless image. For these reasons, drawing, especially, with the computer will give confidence to pupils who previously had difficulties with drawing, either because they were easily discouraged by the first mistakes made in a conventional drawing where they may have spent more time rubbing things out than drawing things in (Clement, 1993).

Drawing software presents to pupils limitless colour options. From the colour palette, pupils can easily choose which colour they wish to use. Moreover, if pupils need to use a colour that is not among the colour options, they can create their own mixture. Areas of a drawn image can be filled with colour or the colour mixtures changed at will. Geometric shapes such as squares, rectangles and triangles can be rearranged by reflection on screen (Meager and Ashfield, 1995). The size of the images can be changed easily, for example, they can be enlarged and reduced. Images can be edited, altered and worked without damaging the original (Meager and Ashfield, 1995). Because of this, pupils need to regularly save their design.

Many drawing softwares have different facilities. Pupils can explore different ways of manipulating an image on the screen. They will be able to re-position images and then repeat small areas of a pattern all over the screen. Therefore these kinds of experiments can be useful in their wallpaper, wrapping paper or textile designs.

According to Herne (1996) the following characteristics of drawing or painting software could be advantages of computer art:

1. They are highly responsive for experimenting, drafting, trying out, and a rough sketch pad without the need to save.
2. The colours can be changed rapidly, good for exploring the expressive and spatial effects of colour.
3. Images have stepped 'pixel' structure such as the dots on a television screen. This is a quality that should be accepted and worked with.
4. Working on the computer is a highly interactive medium with absorbing possibilities for individual work and potential for group work, joint decision making and discussion.
5. It puts highly professional lettering and technical drawing within the reach of young children.
6. For observational drawing it is often best to restrain use of tools using only 'free hand' lines, the 'spray gun' for shading and perhaps 'fill' for backgrounds and large areas of colour.
7. The highest quality work will come through the use of 'zoom' to work pixel by pixel on adjustments to small areas of the image. Therefore the 'perfect' image can be produced.

Most importantly, using a computer saves time in every stage, especially the initial stages of designing, so pupils have a chance to do more experiments.

Disadvantages of Computer Art

Colour is inconsistent, and there are often differences between screen images and print. A printed out colour chart could be provided to compare with colours on screen. Herne (1996:27). However, this could be a disadvantage of the computer since pupils can be disappointed with the printed results of their images on the screen. They might, therefore, be discouraged by the differences.

Using a mouse might put pressure on pupils, since even the smallest movement can cause a big stroke on the screen. This could also effect pupils' confidence and they may feel uncomfortable while they are using the mouse. However some experiments will be helpful for using the mouse properly. On the other hand, the new innovations such as 'easy ball' and 'track ball' will be more ergonomic for the pupils. They work with only a finger movement that is suitable for little hands.

Place of IT in Art Education

According to NCET (1996) and (1995); Mathieson (1995) and (1993); Meager (1995); Cross (1994); SCAA; Ghislaine (1994) IT contributes to the following areas in an art, craft and design classroom:

Using Computers for Word Processing

Using word processors helps the pupils in every area of the curriculum as well as art subjects. Word processors and desktop publishing packages enable children to produce newsletters, articles, assignments, etc. (Ghislaine, 1994). Furthermore, according to Cross (1994: 84) 'The use of word processors in various shapes and forms enables children to describe in words what they might do, what their plans are, how to do things, what they did and what they think about what they did'. Moreover words can be used in producing projects, leaflets, posters, brochures or evaluation sheets, etc. wherever art, craft and design is involved.

Using Computers for Designing
(Computer Aided Design)

The computer can be described as the most powerful new design tool (Mathieson, 1994). However it cannot be said that the computer is the most suitable tool for every design situation. Sometimes using a pencil or water colour could be a more adequate medium for a particular design context. Furthermore the computer can never be seen as a substitute medium for design contexts. Yet it could be a novel and innovative medium for design contexts.

Children need to understand Computer Aided Design (CAD) so that they can apply their knowledge and understanding to future experiences in design classes. Moreover they should be encouraged to develop their skills and attitudes that will be transferable to other areas and their changing new environments. According to Ghislaine (1994) there are several strengths of CAD. CAD:

- is accurate
- saves times
- has the ability to manipulate images easily on screen
- enables drawing in two and three dimensions and allows viewing of the drawings
- allows images to be stored for reference
- gives access to a wide range of samples of colour
- provides opportunities to consider typeface and layout operations at the press of a button, and
- allows scaling up and scaling down.

When pupils make designs, they can easily save every change of their processes, which constructs a base for further development. The saved images can then be transformed by techniques including moving, reflecting, rotating, re-sizing, or distorting. This might include zooming in and editing the colours of individual pixels or simplifying the design using a limited colour palette.

Using CD ROMs

CD ROM means 'Compact Disk Read Only Memory'. It is a kind of recorded visual and sensory information bank but only the sensory ones are used for musical purposes. They might consist of millions maybe billions of databases and information sheets about any kind of topic.

Mainly, they provide children with a wide range of visual and sensory stimuli about art and many other subjects. As NCET (National Council for Educational Teaching) (1996) has indicated, some CD ROMs, which store vast quantities of information incorporating text, pictures, sound and moving images, can be particularly stimulating and motivating for children. CD ROMs can be used in image handling and data handling. In image handling, the children may use the CD ROMs as a source of their stimuli, in other words, they could be used as a starting point for any of their designs. For example, a child can get stimuli for his/her fabric design work then he or she can develop his or her own pattern. It can be possible to find many examples of patterns in CD ROM collections. If a school has a scanning facility, the patterns can be scanned onto a disk for different purposes. Then, the children can explore the possibilities of colouring, cutting, pasting, moving, rotating and printing the stored patterns.

When using CD ROMs children can easily reach limitless information about art, art history and artists' works. According to Herne (1996) CD ROMs will allow the children to research encyclopedias of art held on interactive compact disks, in the classroom. In addition to this, maybe, they will take a trip to the National Gallery in London, from their own seats.

Using Computers for Modelling

Children can use a modelling software to investigate shape, form and space on the computer screen. Therefore, they are enabled to make three-dimensional (3D) designs on two-dimensional surface. 'Through the use of painting and drawing software and 3D modelling packages allowing pupils to explore situations and visualise the outcomes of different approaches, methods and techniques' (NCET, 1995:1). Modelling software can be used to make and explore 3D forms that can be constructed in the future. Moreover they will be able to make numerous experiments on their 3D models without any fear for damaging or losing them.

According to NCET (1995: 6-7) by using a 3D modelling software package:

> "... the children can create 3D forms by drawing a profile line which can then be extruded (pulled out) or lathed (rotated around a central axis). Even by entering relatively simple profile lines, interesting and varied forms can be created instantaneously by the computer...3D modelling software allows the forms to be rotated and viewed from any point in space. This provides much more spatial information than trying to visualise the form by means of 2D drawings and projections. By changing the shape of the profile or by changing the mathematical values used to generate the model, pupils can make changes and modifications and see them applied to the form immediately. Some 3D software will allow pupils to add surface texture and pattern and to apply lighting effects to their forms. Different views can be sequentially saved and used as the basis of an animated view. Once a form has been decided upon, its basic structure can be formed and built, in this case from papier-mâché, cane, wax and textiles combined with natural materials. The techniques suggested here would also be applicable to ceramics and other types of construction".

Children can also use some 3D objects' pictures that they have been taken by digitised camera or video camera. These pictures may be used as a starting point for developing their 3D sculptures or work in different materials. They could play with these pictures by changing their textures, constructions or simply their measurements. So these experiments will give them enormous stimulus for their final 3D work.

Using Multimedia for
Handling Information

By providing access to various visual resources which include multimedia art galleries, multimedia presentations and visual databases the children are enabled to develop their knowledge and understanding of the methods and techniques used, and the purposes for which artefacts have been created and their historical and cultural contexts (NCET, 1995). This contributes to art history and art criticism in art education. Moreover children can understand and learn art history in more interesting ways.

Using Computers for Textile Design

A drawing software can be an ideal tool with which to carry out the design and planning stages in a textile design project. It will be helpful both to simplify the process and increase the accuracy and general speed of the planning and production stages of textile design.

Pupils may make their textile designs by re-sizing, changing proportions, copying, pasting and so on. Therefore, they will be able to exercise total control over the arrangement and overlapping of the shapes until the desired images are achieved. 'The grid facility in the software will allow the pupils to position and move the shapes accurately in relation to each other' (NCET, 1995).

There are also other alternative methods for designing fabrics. They might include photocopying the designs and then transferring them directly onto fabric by using a hot iron. A similar method uses different kind of cartridges. These cartridges contain a special ink that will transfer the printed image from paper to fabric. Then hot ironing will be enough to transfer. Moreover, in the market, there are also special papers that do the same work, but they can be expensive (Meager and Ashfield, 1995).

Pupils can explore the effect of how the same printed paper image can be used several times. Each time the image is ironed onto a new piece of fabric, so the colour will be lightened giving a chance to pupils to make comparisons about the different colour tones (Meager and Ashfield,1995). On the other hand, by using a scanner and draw-mouse, pupils are able to copy the design onto the fabric. They are also able to change colour arrangements and follow them through 2-D modelling. Print management programs allow them to print out their designs onto silk fabric in many colour printers (Ghislaine, 1994). Moreover by using a computer, knitwear, patchwork, appliqué, and stencil designs can also be created (NCET, 1995; Hughes, 1990).

Before making the final decision on fabric selection and colour, the effect of different colour combinations can also be explored on the screen. A computer is an ideal tool in the whole process (from the beginning to evaluation stage) in these types of art activities.

Using the Computer as a Sketchbook or
a Resource File

In all art activities, using a sketchbook is fundamental to stimulate pupils, keep their ideas and have starting points for their art work. It might be said that, instead of the more traditional kind of book, pupils can use a computer as a contemporary electronic sketchbook.

On the other hand, a scanner can be used as another stimulation provider for their art work. For example, they can scan natural and man-made items in order to have a detailed view. Scanning items at a high re-solution enables the resulting images to be magnified

both on screen and print outs, revealing details of their structure, texture and form as if they were being viewed using a magnifying glass. The results can form the basis for a series of personal or class sketchbooks with which to develop both computer-based images and to be used as a resource for developing work using traditional media as well as a computer-based resource (NCET, 1995:6).

Pupils can transfer these digitally captured electronic resources to their own work. They can then develop computer-based ideas, perhaps using software that stimulates traditional media, and save them as an electronic sketchbook. Therefore they will be able to find a chance to combine computer images with traditional media.

The great virtue of using the computer in art, design and technology teaching is not its capacity to make images electronically as an easy alternative to using more conventional means, but in the ability it gives children to explore ideas, variations and systems at considerable speed.

Other Facilities of Computers

Logo: This is a programming language that is used to control either a screen sprite (a turtle) which draws on the screen or a floor turtle. Turtle is a robot that can move around and draw on a paper. Both screen and turtle logo can be used to create graphics (Cross, 1994). This program language develops pupils' mathematical thinking abilities by helping them make combinations with given information, and also they are able to make comparisons with drawn images.

Letterforms, typefaces and illuminated initial capital letters: Studying with the letterforms and typefaces can provide rich compensation for pupils in art, design and technology classes. The appropriate use of fonts and lettering is essential for design materials to communicate effectively. Using a computer allows pupils to explore working with and using type in a wide range of contexts.

Pupils can use these letterforms and typefaces from different times, in a selection of different publications and sources, such as posters, magazine advertisements and packaging. 'Using the computer and software, pupils can carry out a practical exploration of typefaces. By exploring the use of different fonts, sizes and type styles and then evaluating the print-outs, pupils can gain practical experience in the appropriate use of type and graphics and discuss the effectiveness of the communication within a given context' (NCET, 1995:2).

As can be seen in every new innovation, computer art has critics as well. Most art educators ask whether images created on a computer are art images (Greh 1986). Greh also continues by quoting from different ideas such as 'Mueller (1983:136) who cautions that for some the assumption is: 'Since it is visual, it must perforce be art. This viewpoint is not only naive; it is sloppy thinking'. 'Is it art? Ten years ago people asked, can video be an art form. It depends on who does it. Art is what artists do' (Greh, 1986:5).

Even if it has been accepted as an art, there are also other critiques that are based on different aspects. Some art educators may find it expensive whilst the others may be meeting political resistance from school boards or administrations. However, Greh (1986) points out different views from Clements (1985) and Sasowsky (1985). They indicate that 'the greatest resistance may come from art educators themselves and fear of the computer' (Greh, 1986:5).

Conclusion

Every child is ready for variations, adventures, investigations and experiments. Children need a wide range of activities that should not to be repeated in art classes. Repeating ideas would be real boredom. There is also some benefit in seeking different new mediums and presenting them to children. Practically, children generally use pencil, crayon and paint for expressing their ideas and feelings or what they see. Using a new medium could be very stimulating.

When we think of a new medium in teaching, a computer can be given as a good example. Since after all traditional art media are paint, pencil, crayon, chalk, clay, plasticine etc. a computer appears as a 'new art medium'. A computer with colour monitor, a mouse and a colour printer are enough to create new variations, adventures, investigations and experiments. Additionally, it should never be seen as an alternative to traditional art materials. However, it can extend art experience by freeing individual from traditional constraints so that ideas can be explored more freely than using traditional art materials. Moreover it helps children to develop a deeper understanding of the elements of art.

It is believed that it would be worthwhile for children to be introduced to newer media in art and design classes. Computers can be extremely exciting and stimulating for them. It would be suggested that it would be worthwhile for children to learn about what contemporary artists are doing and why they are changing the art world. One aim of a good art programs to encourage pupils to be discriminating about the quality, significance, and interpretation of art of their own time and art from the past. By understanding the advantages and disadvantages of using a computer, a good balanced art program can be constructed.

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