Using Computers to Create Art with Primary Children

BIRNIE DUTHIE
AND JANE CHIA

Introduction

Traditionally, artists have frequently explored, challenged and stretched the limits of art practice as it exists at any given point in time. Computers give artists another tool to expand art practice as it currently exists. Many artists, for example David Hockney, Sidney Nolan and Andy Warhol, have seen the potential of this particular medium as an art form which will challenge existing perceptions about art. Computer art, just as any other medium, has its tools and techniques and its aesthetic aspects.

Whereas some attention has been given to the techniques of creating computer art, little has been written in an attempt to explore the aesthetic qualities of the medium. Just as for other art forms, students need to be made consciously aware of those qualities which distinguish well-designed computer images from those which are less successful and to be able to make informed and sensitive judgements about such images.

This in turn has implications for art educators at all levels of the educational system. Art teachers will require a familiarity with the computer technology to enable them to create computer imagery, an appreciation of the resultant imagery and its particular qualities which distinguish it from works produced with traditional materials and awareness of the invaluable teaching resource a computer provides within the context of art education.

Obviously, the mere presence of computers in art classrooms does not ensure that they will be used effectively or appropriately. New ideas and developments are often viewed with suspicion:
"It happens over and over again in our experience. The new and unfamiliar are frequently received with discomfort and, sometimes, rejection". (Hausman, J.J., 1991, p. 5)

Not all that is new deserves to be accepted and valued:

"For present day art teachers, computer and laser disc technologies make up a relatively unfamiliar terrain. Understandably, there are those who urge caution that we do not rush headlong onto another bandwagon of new media and techniques that will diminish or divert us from the more personalized Identification and controls of traditional art activities". (Hausman, J.J. 1991, p. 5)

However, each medium and technique offers its own potential for art activity and it is the human being's use of the medium which creates the art form. The use of technology to create art works has much in common with making art using traditional media. As with other art processes, the technical and conceptual differences involved in the use of computers need to be considered when developing art programmes using the technology.

For art educators to be without the skills, understanding and knowledge of computer-based art work, is for them to be less than well-educated. Such art teachers will deny their students the opportunity to explore an art medium for the creation of art works.

Computer-based art work has a place in all art programmes. It is essentially concerned with visual imagery and the programs exist which will extend the possibilities of traditional media and techniques. Programs for micro computers facilitate the visualization of artwork (for example in printing and 3D work) and enable students to execute art in ways that are uniquely different from what is possible by conventional means. Students can also learn to use the computer for sketching and saving a number of ideas quickly. These ideas can be modified readily and each stage of this modification or elaboration process can be saved for future retrieval.

Notably, in the design and printing industries, computers have had a profound impact. Art teachers need to be introduced to lettering, layout and production and the use of electronic fonts. They also require the skills which will enable them to solve design problems using computers as they will be expected to be generally competent in design in the school context. The programs available will speed up the design process for them and can improve the quality of their finished work which is crucially important for the image of the subject.

With a commitment to the inclusion of computer-based art in the art education programmes at the National Institute of Education, our Diploma Art Specialist students received some background and experience of the computer as an art tool. The aims of this experience were:

- To familiarize the students with the tools and techniques required in producing computer-based-art work;

- To introduce the students to the aesthetic considerations inherent in the art developed on a computer;

- To enable students, through direct experience, to comprehend the value and potential of co-operative learning which frequently accompanies computer-based learning.

These three areas were also considered to be central concerns of art teachers at a variety of levels. The value of co-operative learning which has computer-created art work as a focus, has yet to be fully explored and the idea emerged of investigating this strategy with reference to a group of school students from a particular level.

Consequently, as part of the programme for these Art Specialist students at the National Institute of Education, the Saturday Morning Art (SMART) programme was developed. It is a research and development project for Primary Level students working with two art lecturers and the art specialist students 'in a team teaching situation. For the sake of clarity, the art specialist students will subsequently be referred to as 'the students' and the Primary Level students as 'the children'.

The programme aims to:

- Extend children's abilities to make art works and to develop their understanding of art, and

- Provide a focus for the professional development of students. Using computers to create art works has been a component of the Diploma Programme for the trainee art teachers and is one focus for research within the SMART programme.

The Saturday Morning Art (Smart) Programme

The Saturday Morning Art Programme at the National Institute of Education has been designed to enrich children's experience in art knowledge and activities, including those associated with computer graphics. It based on the belief that children with initial interest and motivation can excel to a high level of achievement in art if the appropriate stimulus, support and facilities are available. It is also based on current research in art education relating to personal and creative development suggesting that growth in creative and expressive skills is enhanced through access to knowledge, skill development and experience.

The programme is designed to diagnose children's individual interests and aptitude levels in a range of practical and theoretical areas, and to offer some extension work in one particular area. It is recognized that the identification of areas of talent should occur within a programme which enable the talented traits to manifest themselves.

All the children should benefit from the programme because of the planned focus on their strengths and needs, the support of the monitoring students, and the benefit of working within a smaller group of interested peers.

For the children, the programme has the specific objectives of enabling them to:

–   Engage in a range of worthwhile art experiences which will interest and motivate them, and provide the basis for extended study;

–   Demonstrate areas of particular interest or ability;

–   Extend their skills and knowledge within these areas;

–   Develop confidence and creativity through a combination of acquiring art knowledge, and developing art practical and .critical skills;

–   Work co-operatively with peers and adults on a common project;

⁻   Present their combined work at an end-of-course exhibition. And, for the students, their involvement in the SMART programme will:

⁻   Extend their knowledge and skills about the teaching learning process;

⁻   Explore ways of monitoring children's development;

⁻   Enable them to explore some of the techniques of research which can then be applied in the classroom situation;

⁻   Engage in joint planning, implementation and evaluation of a programme.

Each student works with a pair of children, one girl and one boy, and the data collected is analysed. This data will eventually be presented in the form of case studies and become a component for the assessment of the students within the Diploma in Education Art Specialist programme.

COMPUTER WORKSHOP SESSION

During the first term of the programme, the children spent the morning in the computer lab working with their own textural drawings which had been digitized.

The objectives of the session were to:

⁻   Introduce children to a new way of image development and manipulation by using a limited range of tools in the Macpaint programs;

⁻   Document their reactions to the medium through questionnaires, observation and interviews, and make tentative conclusions from the results;

⁻   Engage children in an expressive exercise to produce enhanced images which could be used, in printed form, as part of a group mural project.

The Macintosh SE computers were used for the session as they presently provide, within the National Institute of Education, the most user-friendly method of developing artwork. In the limited time available, children would have found it difficult to generate new imagery into the computer. Research suggests that they also may have tended to revert initially to stereotyped forms (Stockrocki 1986) and we saw some evidence of in the exploration or 'play' stage. As with other media, students explore, play with and try out techniques in a manner which acquaints them with the limitations and possibilities of the medium. However, this trying out is also an integral part of the work in hand as ideas can be reworked and modified very directly during the process of production in a way which is not possible with traditional materials.

It was therefore decided, in order to avoid as far as possible the stereotyped imagery, to provide the children with a file containing their own pen drawing which had been pre-scanned into the computer. We believed that using their own drawings as a starting point would provide them with a ready-made image at their optimum level of conceptual and technical capability. In the time available, it would provide them with a starting point for manipulation using some of the draw, erase, cut, copy and paste functions of the programme.

The children had already produced a highly textured drawing as an interpretation of an external area of the National Institute of Education, and in response to the textural work of Vincent Van Gogh. Their drawings were subsequently scanned onto Macpaint files. The students were given extensive briefing before the session including hands-on experience of the computer programs features the children would use. Their role as advisors, observers (and, if necessary, time-referees) was discussed in relation to the questionnaires and interviews to be carried out, to the restricted range of tools recommended for beginners. Some key questions were agreed to as useful prompts to generate action on the scanned images. Children were given a pre-session questionnaire enquiring about their previous experience and their interest level in using computers for art.

For the benefit of children new to the Macintosh, the children were introduced to the monitor, the mouse and the menu for the programme. Tools were introduced in two phases. Firstly, a selection of key tools (pencil, brush, rubber, spray) was demonstrated on the OHP palette followed by a short period of experimentation. The second phase

included *zoom*, *cut, wpyandpaste.* The students were to be responsible for opening new files and saving newly developed imagery.

After 15-20 minutes experimentation each, they had access to their own drawings, and were prompted by the pre-set questions from the students to consider alterations using the tools at their disposal. They were asked what they liked best about their drawings, and what they liked least? Discussion was also centred on what changes might help the shapes stand out or to repeat an interesting section in another part of the composition. They then had 30-40 minutes each to explore the potential of these tools and develop one or more alternatives to their original drawing. At the end of the session, another questionnaire was administered, and subsequently followed up with an interview on their reactions to the computer print-out of their altered images.

The students were required to furnish a full report on the session, noting their two children's reactions and relating what they observed to the questionnaire and interview responses. The children's artwork was analysed in terms of the degree of manipulation in developing a significantly altered, visually effective image, saved on a new file. The questionnaires were analysed to determine any significant features from the whole group and to relate the findings to the artwork and to the students' reports.

We are currently analysing the data and developing case studies which monitor the progress of the children. What we can show here are examples of the children's computer-created art work which illustrate the wide range of skills and understanding present within the group. These images are presented as Figures 1–3. (See also the design on the front cover of this edition of **Teaching and Learning).**
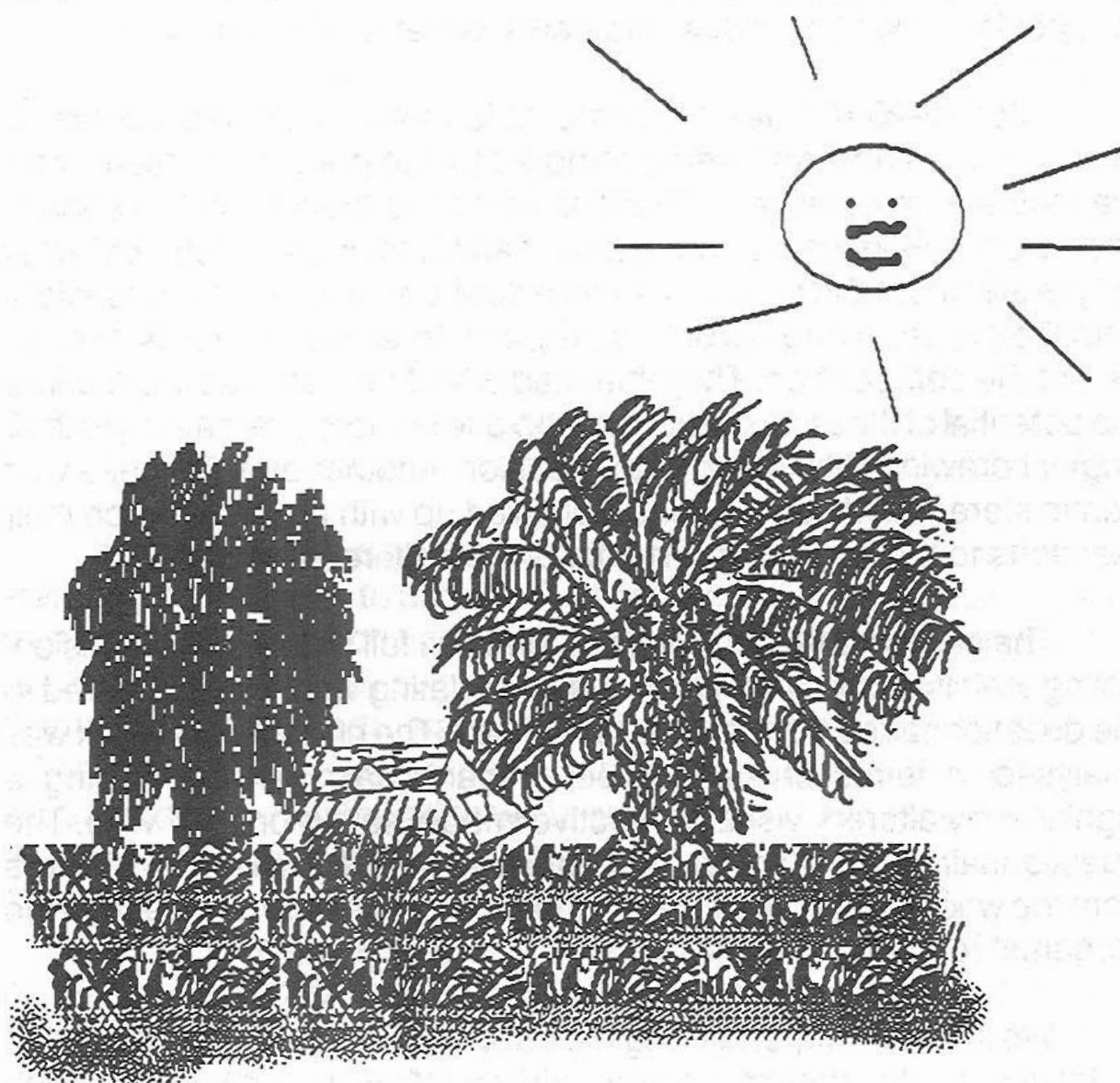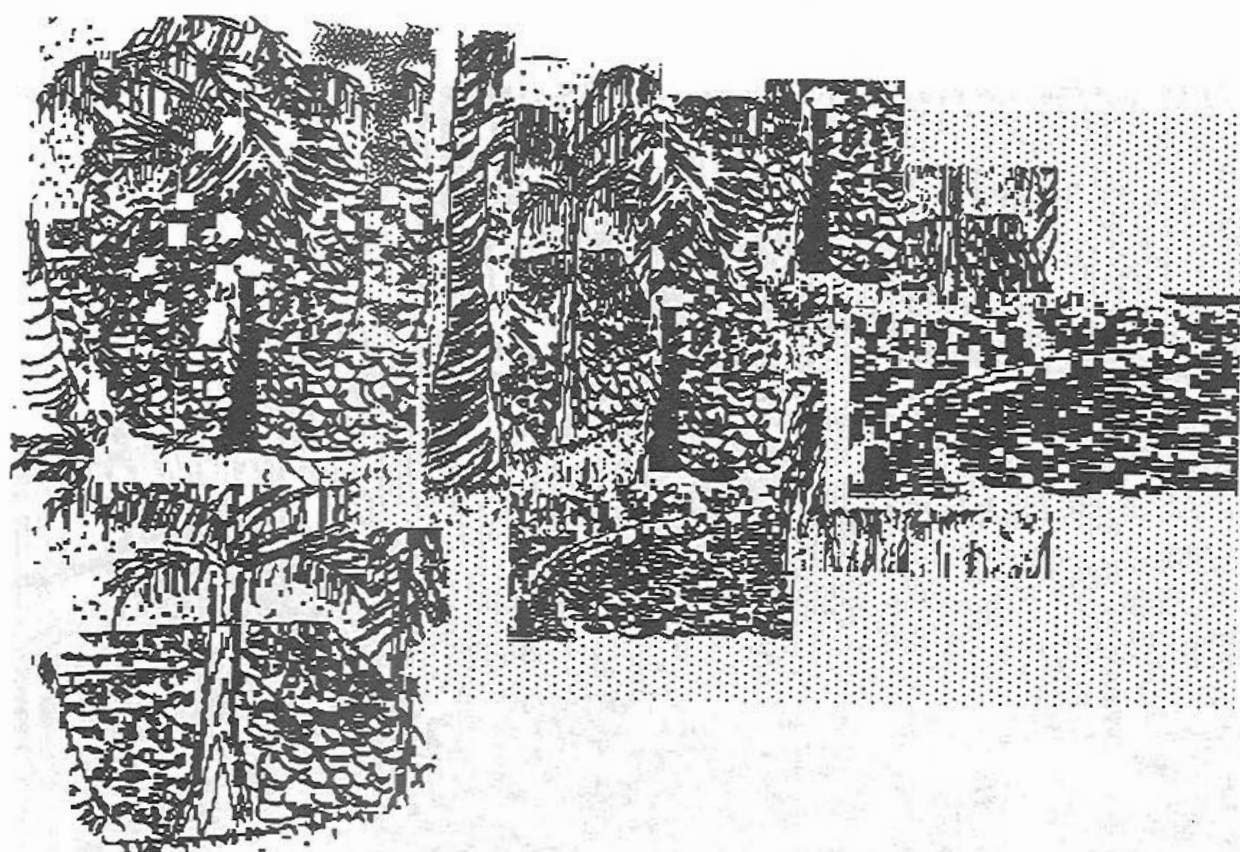
Combined Images by Dean (aged 11) and Lihong (aged 10)
Nanyang Primary School

FIGURE 1
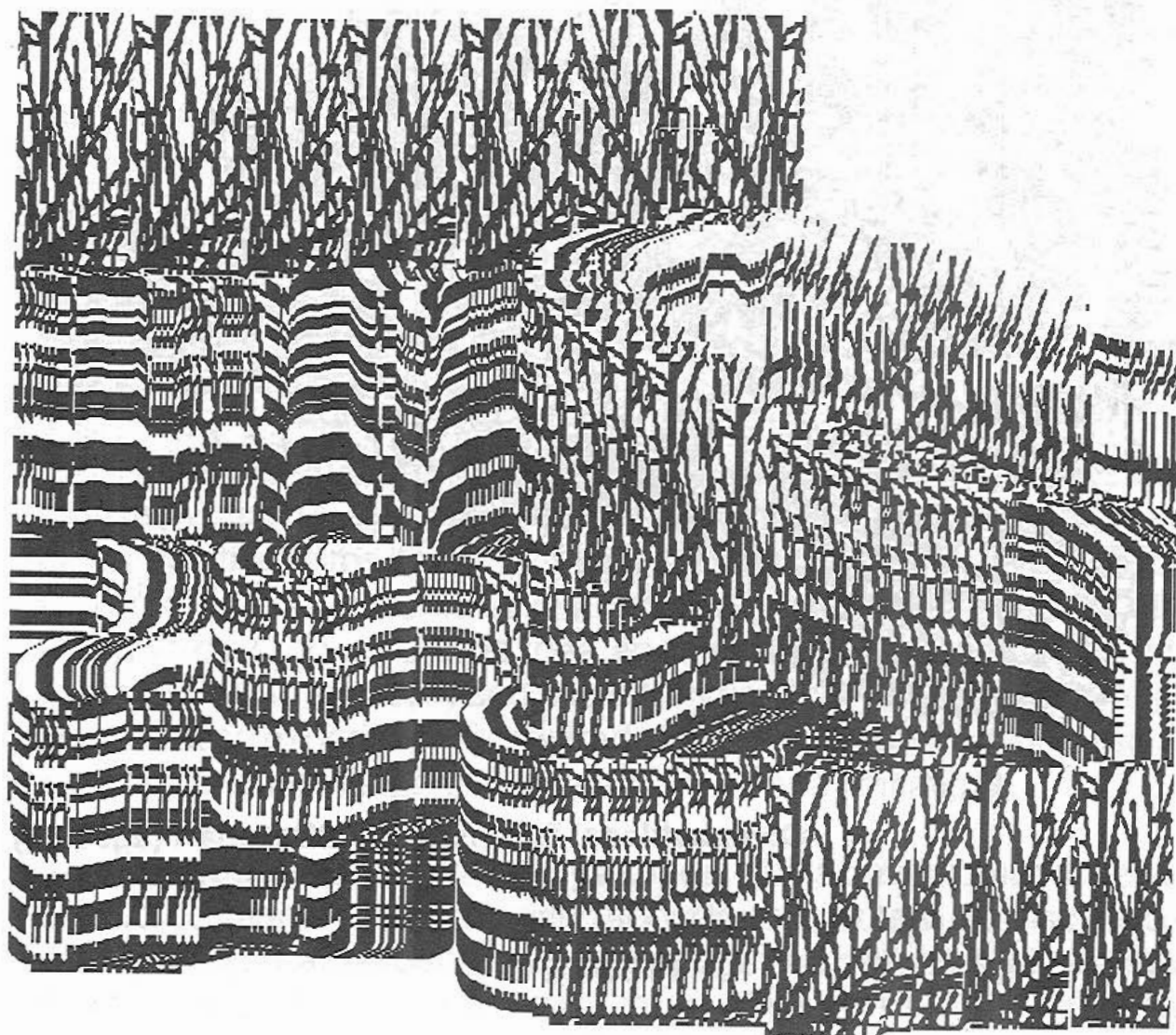
Brush Explorations by Beatrice (aged 12)
Swiss Cottage Primary School

FIGURE 2

Compositional Extension by Worachart (aged 14)
Farrer Road School

FIGURE 3

In Conclusion

Our experience of the SMART programme has convinced us of the value of including a computer-created art component in art education programmes at both the school and higher education level.

Particular art elements which can be effectively taught using computer technology are those of movement, light, chance, converting and combining imagery. These elements, which are too frequently omitted in art education programmes possibly because they have been difficult to demonstrate and produce for school use, now become accessible through the use of computers. It is these elements which probably form the basis of the particular aesthetic qualities which are inherent in computer graphics work and could be brought readily into the classroom with technology.

On a broader front, social interaction and co-operative learning are also facilitated by computer work. To extend these pedagogical aspects, which seems to be a feature of using computers for educational purposes, will require the development of sophisticated and appropriate teaching and learning strategies.

Additionally, the facility to evaluate and modify in progress, an art work in the process of being created, is an invaluable tool now available to art teachers. The process of production can now be directly integrated with critique and evaluation which is probably a unique feature of utilizing a computer to create art forms.

There are crucial differences in the process of production as well as in the visual qualities of computer graphics as compared with other, more traditional media. It is these differences which need to be explored so that students have a range of techniques and skills with which to develop an artistic idea appropriately. 'Appropriate' in this context refers to the ability and understanding (comprehended through art education experiences) required to select a medium on the basis of knowledge about its particular possibilities and limitations.

It is also apparent that many aspects of this development need to be studied, researched and written about to contribute to the discussion. With training, background and knowledge, art teachers will be in a position to utilise this technology in art classrooms. They will have gained the confidence to explore the medium and exploit its enormous potential to the benefit of their students in art classrooms.

School communities and other educational establishments, will benefit from the recognition being given to the visual aspects of computer technology. Computers do not make art but in the hands of art trained people, they can help to create well-designed and fully-developed visual imagery.

References

Bernstein, S. and Mc.Garry L. (1986). *Making Art on Your Computer,* Phaidon Press Ltd., UK.

Brand, S. (1987). *The Media Lab: Inventing the Future at MIT,* Viking, Penguin, p. 9.

Davis, D., Erikson, F. *and* Vonk (1986). *Micros and Art,* Learning Publications Inc., Florida.

Freedman, K. and Reelan, A. (1990). *The Use of Applications Software in School: Paint System Image Development Processes as a Model for Situated Learning,* Journal of Research on Computing in Education, 23(1), pp. 101-103.

Freedman, K. (1989). *Micro Computers and the Dynamics of Image Making and Social Life in Three Art Classrooms,* Journal of Research on Computing in Education, 21(3), pp. 290-298.

Freedman, K. (1991). *Possibilities of Interactive Computer Graphics for Art Instruction: A Summary of Research,* Art Education, Vol. 44, No. 3, May, pp. 41-47.

Hausman, J.J. (1991). *Computers, Video-Discs and Art Teachers − An Editorial,* Art Education, Vol. 44, No.3, May, p. 5.

Hawkins, J. (1984). *Computers and Girls: Rethinking the Issues,* Report No. 24, New York: Bank Street College, Center for Children and Technology.

Hubbard, G. and Greh, D. (1991). *Integrating Computing into Art Education: A Progress Report,* Art Education, Vol. 44, No.3, May, pp. 18-24.

Loveless, R.L. (ED.) (1989). *The Computer Revolution and The Arts,* University of South Florida Press.

Marshall, J.C. and Bannon, S.H. (1986). *Computer Attitudes and Computer Knowledge of Students and Educators,* AEDS Journal, 19 (4) pp. 270-286.

Stokrocki, M. (1986). *Qualitative Interpretation of a Microcomputer Graphics Course for Gifted and Talented Adolescents,* Art Education 39 (1) pp. 44-47.

Truckenbrod, J. (1988). *Creative Computer Imaging,* Prentice Hall, New Jersey.

Wilson, S. (1986). *Using Computers to Create Art,* Prentice Hall, New Jersey.