The Development of Three-Dimensional Art Thinking and Practice at the Secondary Level

Jane Chia

Historically, psychologically and aesthetically, the development of children's two-dimensional visual representation across the entire age range of pre-school through secondary, has been well-researched and documented with, for example, such seminal works as Ricci (1887), Sully (1896), Luquet (1913), Krötzsch (1917), Goodenough (1931), Richardson (1946), Carlyne (1968), Lowenfeld and Britain (1970) and Kellog (1969). More recently, researchers such as Golomb (1992), Krampen (1988) and Matthews (1988) have contributed to and extended the debate particularly with the emergence of cross-cultural studies. Issues such as innate or learnt visual iconography, the universality of marks, symbols and images or their cultural specificity, the role of visual memory and the nature of research experiments and subsequent generalizations, are all forcefully debated.

However, the development of student's three-dimensional development and understanding has received scant attention and what little exists (e.g. Golomb, 1974) focuses upon clay as the three-dimensional medium utilized. Clay is advocated without discussion as the material of choice in the few reported studies (e.g. Brown 1970, 1984; Sullivan 1986) on the basis that it is a natural material and students can quickly change their ideas when working with this very plastic medium.

Additionally, whilst there are numerous archives of children's drawings and paintings around the world, many of which are recorded and annotated in the Retallack-Lambert directory of children's art archives, three-dimensional art archives are extremely rare. Three-dimensional work requires a great deal more storage space than children's paintings, added to which, there is the very real possibility of damage. Technology has enabled many of the existing two-dimensional archives to go on-line and electronic retrieval systems enable three-dimensional collections of children's work to be similarly stored. Such systems also make contextualizing children's art work more informative as the process of art production can also be stored electronically. Although a computerized image is not the authentic work as produced by a child, it does have advantages over existing archives in terms of the ease of

transfer of information across the world and storage but this potential has yet to be exploited for three-dimensional art works which remains a neglected area for research.

An opportunity for a three-dimensional school-based research project presented itself through the Art Division's on-going involvement with the National Arts Council's Visual Arts in Schools enrichment programme.

THE PROJECT

The impetus for this three-dimensional project, the *Dinner Party*, came through the International Society for Education through Art (INSEA) a UNESCO affiliated professional organisation for art educators. In particular, the work of two INSEA members, Professor Nancy Lambert in Montreal and Dr Phil Perry in Melbourne. A Canadian *Dinner Party*, made entirely from papier maché was exhibited at the 1993 INSEA international conference in Montreal where the life-sized figures and food were laid out around one huge table banquet style, on very public display in a shopping centre. Subsequently, at the INSEA Asian regional conference in the Philippines in 1994, Dr Phil Perry spoke about the project he directed in Melbourne. This time, the *Dinner Party* was exhibited in an art gallery. Slides were also available of the Montreal exhibition and Dr Perry very kindly sent us a selection of slides of his project which showed both the process of construction and the final product.

The intention was to produce a *Dinner Party* Asian style that is an exhibition of life-sized figures and food made entirely of papier maché which would reflect multi-cultural Singapore where the Chinese, Malays, Indians and Eurasians form the three main ethnic groups. The National Arts Council (NAC) of Singapore was approached and they were very enthusiastic about the proposal. Consequently, through the NAC's publicity mechanism, secondary schools were invited to join the project. The NAC also funded the duplication of slide packages and the venue for the exhibition. Finally, four schools and 400 students were involved in the project; the students coming from four secondary schools and ranging in age from 12-14 years.

Three staff from the Nanyang Technological University, Art Division were involved, John Smith, Paul O'Shea and Jane Chia plus teachers in the four schools. In all, the work took about 12 weeks to complete but

this time, it included initial workshops with the teachers. These workshops provided information about construction methods with papier maché, using the initial slide package and organizational issues. An initial 20-slide package was provided for each school which included examples of the Canadian and Australian work plus historical and cross cultural examples of life sized human figures (e.g. the terracotta army in Xian and the work of the American artist, Duane Hanson) and this constituted a basic resource pack. A major issue to determine was which students would make which figures in order to have a good cultural spread of figures and food in the final exhibition. Each school was required to produce for exhibition, a range of figures (Malay, Indian, Chinese and Caucasian), the corresponding food and dinnerware.

A reference sheet was provided for each figure/food type giving dimensions, instructions and a range of suggestions. Each figure had to have a basic place setting consisting of a rice/soup bowl, a spoon and fork, chopsticks, a dinner plate, a drinking glass and a napkin. Additionally, food and other objects had to be made for the centre part of the table. At an early stage, it was decided that these diners would sit down in groups at circular tables as this was the characteristic way of dining in Singapore.

The *Dinner Party* project was exhibited at Raffles Atrium (Singapore) in September 1996 and the display included 48 figures, one waitress and all the food (see Figures 1 and 2). Slides of both the exhibition and of the work in process were developed into a second resource package for the schools. When the exhibition ended, the figures and food were taken back to the participating schools for further display. One school, for example, organized a parents' evening with a buffet at which the papier maché figures "mingled" with the parents at the food tables.

The schools were visited at regular intervals for the duration of the project to record work in progress, to talk with the students and teachers and generally to offer support for the work. These visits proved to be essential to the development of the project and facilitated a sharing of ideas across the schools. Additionally, detailed observation notes of the project were maintained as matters of interest concerning students' three-dimensional art practice emerged and these data form the basis of the observations in this paper. The summary of the observations to date are organized into two main categories: the technical forming processes utilized by the students to create the figures and food from papier maché, and the more over-arching working strategies adopted by the students.

Summary of Observations

1.   FORMING PROCESSES

The teachers in all the schools divided their students into groups and each group worked on either figures or food. The forming sculptural process involved in this work was additive with the papier maché being modelled around a chicken wire frame for the figures (see Figure 3). All the students created their wire-frame bases for the figures in sections, namely, arms, legs, torsos and heads, and then joined all the sections together. The most common method of constructing the sections of the figure, and something we observed in all four participating schools, was the joining of two, two-dimensional wire templates to create three-dimensional forms. In the case of hands, students would typically draw around their own hands twice directly onto the chicken wire, cut out the resulting templates, join the templates together and then pad out the joined shapes with rolled up newspaper to create a three-dimensional form.

There seemed to be little preparation for the groups in terms of human anatomy and the understanding and construction of form from observational drawing which might have assisted the students in this frame-building process. Students were largely expected to work from their imagination and conceptually, but, by the second and third weeks, students were utilizing each other as models to assist them in frame-forming, often using real limbs as forming structures for the wire. In this manner, students discovered for themselves important structural aspects such as anatomical proportion, weight, mass and balance.

All the figures except one (the waitress) were in a seated position which is technically an easier proposition than a standing figure. However, the 48 seated figures presented their own technical difficulties such as how to ensure the figure was well-positioned to the back of the chair to prevent slippage sideways or forwards, that arms were in the correct position for the table plane and that the legs of a figure reached the floor which assisted in the balancing of the sculpture in a seat.

The figures tended to be rather statically posed at the tables with few groups having investigated the possibility of arm movements. The two most common arm positions were either on the table without eating utensils in the hands or on the lap of the figures. However, there were striking examples of variation on this form. In one school, for example, a male Malay figure is seen with an upraised arm as if summoning a waitress (see Figure 4). Clothing the figures presented certain difficulties

with all the groups making clothes to fit the figures and fitting them once the figures were completed. Painting of the clothes only occurred once the clothes had been fitted and decorative details such as jewellery were added to the whole figure at the final stage of the process.

For the food, students used both the modelling and moulding techniques either separately or in combination. For example, a dinner plate was typically moulded in papier maché and the food modelled and later stuck to the plate. Papier maché is very easy to join and so a whole chicken on a plate would begin with a wire frame and then legs and wings were added having been formed separately.

2. WORKING STRATEGIES

We were impressed at the ingenuity of the students to consider and utilize other materials on the rare occasions when papier maché would not serve their purpose. For example, in one school, overhead transparency acetate sheets were found to be an ideal material for making drinking glasses and the lenses for spectacles. All four schools independently decided to have a dinner service pattern for their particular tableware; in one instance, the design identifying the school by choice of colour. This strategy proved to be a unifying factor in the final exhibition of the work as there were only four different tableware designs which did not detract visually from the huge diversity of food and table decorations.

There was certainly a range of work presented by the students from the four schools which ranged from that which was extremely competent and sophisticated technically to that which was clearly more expressive in intent. Realism, or the close imitation of volumetric properties of the three-dimensional objects, was the aim for all the students, often supported by their teachers. Both students and teachers were extremely aware of the fact that the final exhibition of the work would be in a very public venue and this fact in itself fuelled the realistic focus of the project.

By visiting the schools at regular intervals, it was possible to observe and record working strategies. In no instance was it possible to delineate a preferred working style for any given student. Partly, this may have been affected by the groupwork arrangement which all four schools adopted where problem-solving became a whole group's responsibility with students working in a very interactive context and learning from each other. However, in the space of an hour, individual students could adopt a range of working strategies depending upon the demands of the working progress.

The attention to detail did tend to differentiate the work and this was apparent in both the dress of the figures and the food. All the schools were visited for the final lesson when the figures were being seated around the tables of food. In one school, the teacher was observed asking students about "finishing touches". It was at this point that well-observed variation in detail emerged on the figures such as espadrille laces in shoes, buckles, watches, jewellery, nail varnish, pocket handkerchiefs and buttonholes. The corresponding detail on the food were labels on the drink bottles, white paper decorations around the legs of a roast chicken, condiments such as pickled chilies and ice cubes.

CONCLUSION

As very little has been reported and researched about the developmental changes in students' three-dimensional art, not surprisingly, this project raises far more questions than it addresses and indicates several areas for futute research. What did emerge from this study was that each artistic medium contains unique qualities that require specific skills and that three-dimensional art production has its own domain specific challenges and questions to be addressed. Furthermore, there are intrinsic differences between the properties of a two-dimensional and three dimensional medium and, that put simply, the two-dimensional surface lacks the conditions for imitation proper.

True imitation becomes possible with three-dimensional work but adolescent inclination towards both realism and expression through art requires an art education programme in sympathy with and sensitive to these dual human, developmental needs. Cognitive maturity in itself does not result in satisfying achievement for students in a specific studio area but good quality teaching and a supportive context which encourages individual interpretation are crucial:

> *...with greater cognitive maturity a restructuring is likely to occur in the way the task is conceived and approached. However, cognitive maturity by itself does not automatically lead to competence in a specific domain, and consistent practice and the motivation to master the task in a specific medium are crucial for bringing to fruition the growing potential of children and adolescents.* (Golomb 1993)

Typically, three-dimensional art work has been seen as an achievement of later human development on a continuum which ranges form simple

to complex. However, this assumption is being questioned and challenged:

> *...the hypothesised progression from one- to two- to three-dimensional representation might be based on a mistaken application of the principle that holds the development proceeds from simple to complex structures.* (Golomb 1993)

What did appear crucial was the students' previous experience of three-dimensional art production and the teaching strategies which will enable students to work effectively and to their satisfaction, with sculptural forms. Art learning results from an interaction between a cultural milieu, a sensitive and purposefully planned learning environment and a humanistic view of the student as a sentient, developing being with needs and intentions.

Figure 1:
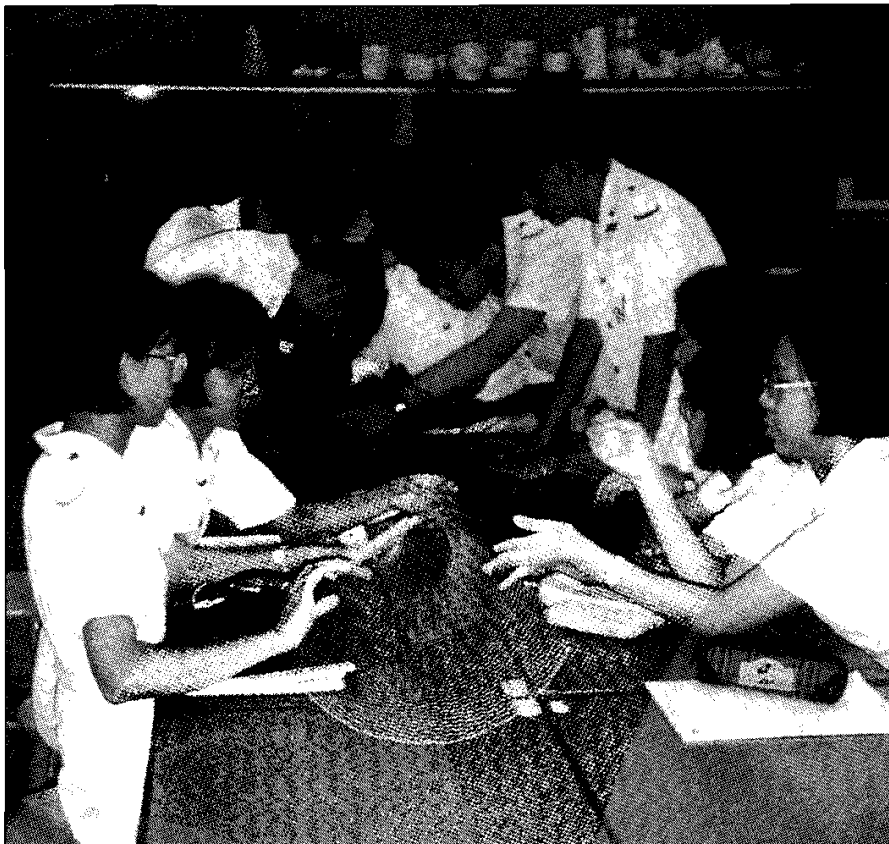Food on Display

Figure 2: Figures and Table Layout

Figure 3: Some Students Working on a Chicken-Wire Frame
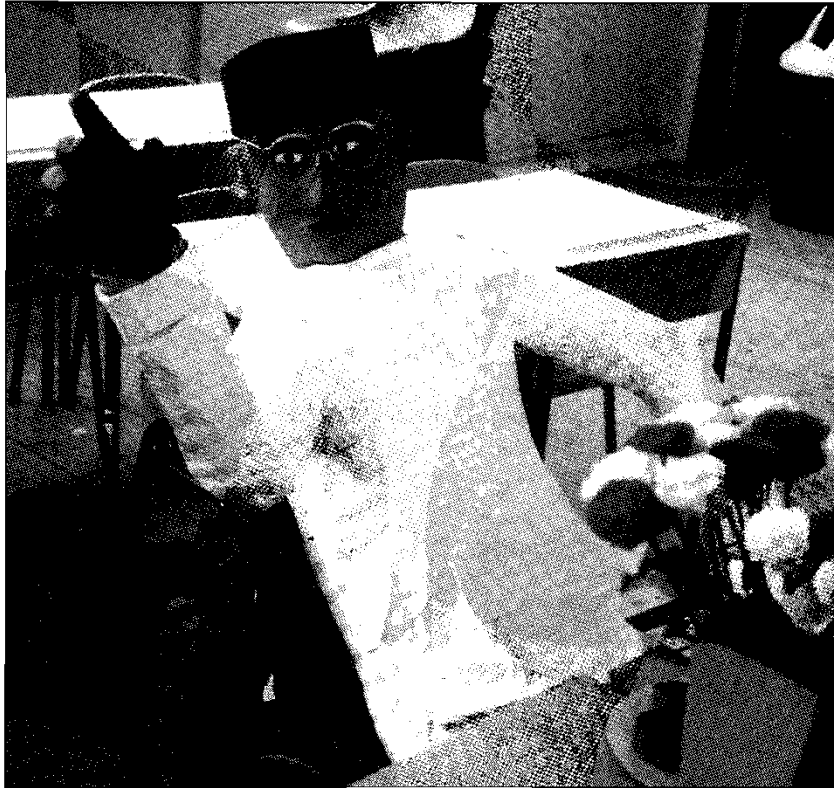
Figure 4:
A Male Malay
Figure

REFERENCES

Brown, E.V. (1970). Developmental characteristics of clay figures made by children from age three through age eleven. *Studies in Art Education*, 16 (3), pp. 45-53.

Brown, E.V. (1984). Developmental characteristics of clay figures made by children: 1970-1981. *Studies in Art Education*, 26 (1), pp. 56-60.

Carlyne, R. (1968). *Draw They Must*. Edward Arnold Publishers: UK.

Golomb, C. (1974). *Young Children's Sculpture and Drawing*. Harvard University Press.

Golomb, C. (1992). *The Child's Creation of a Pictorial World*. University of California Press.

Golomb, C. (1993). Art and the young child: Another look at the developmental question. *Visual Arts Research*, Vol.19, No.1(37): 1-15.

Goodenough, F.L. (1931). Children's drawings. In Murchinson, C. (ed.), *A Handbook of Child Psychology*. Clark Univeristy Press, Worcester, Massachusetts.

Kellog, R. (1969). *Analyzing Children's Art*. National Press Books, Palo Alto: California.

Krampen, M. (1992). *Children's Drawing: Iconic Coding of the Environment*. Plenum.

Krötzsch, W. (1917). *Rhythmus und Form in der freien Kinderzeichnung*. A. Hasse Publsihers: Leipzig.

Lowenfeld, V., & Britain, W.L. (1970) *Creative and Mental Growth*. Macmillan: New York.

Luquet, G.H. (1913). *Les Dessins d'un enfant*. F.Alcan Publishers: Paris.

Matthews, J. (1988). The young child's early representation and drawing. In Blenkin, G.M., & Kelly, A.V. (eds.). *Early Childhood Education: A Developmental Curriculum*. Paul Chapman: London.

Retallack Lambert, N. (1992). *International Directory of Children's Art*. Université de Montréal Publication.

Ricci, C. (1887). *L'Arte dei Bambini*. N. Zanichelli Publishers, Bologna, Italy.

Richardson, M. (1946). *Art and the Child*. Univeristy of London Press.

Sullivan, G.L. (1986). A covariance structure model of symbolic functioning: A study of children's cognitive style, drawing, clay modelling and storytelling. *Visual Arts Research*, Vol.12, No.1 (23): 11-32.

Sully, J. (1896). *Studies of Childhood*. Appleton Publishers: London.

Tarr, P. (1990). More than movement: Scribbling reassessed. *Visual Arts Research*, Vol.16, No.1(31): 83 - 89.

ACKNOWLEDGEMENTS