

Clay Modelling and Social Modelling: effects of interactive teaching on young children's creative artmaking

ANGELA ANDERSON & GREGORY C. R. YATES, *University of South Australia, Australia*

ABSTRACT *In this project, 28 6-year-olds were taught skills involved in artistic claywork using principles of social modelling and cognitive learning in a classroom situation, over a series of six lessons. A further 28 students, serving as controls, were taught according to the normal art curriculum. The students' clay models were photographed on pre-test and post-test, and rated by three expert judges (professional artists familiar with children's artwork) blind to treatment conditions. The cognitive social learning group evidenced strong gains on measures of creativity as defined by approximation to a three-dimensional form, technical competency, decorative competency and aesthetic appeal. The control group students failed to evidence any significant change in rated creativity.*

Tension between directive and non-directive educational approaches comes into a particular focus in the area of art education. It is common for teachers to assume that creative expression is well fostered through non-directive, non-coercive instruction. In such contexts, the teacher/didactic role can be seen as minimal or at least reflective of non-interventionist philosophies of child psychology.

However, significant voices within the field of art education have pointed out that teaching practices within this field are often deficient in terms of providing for structured or sequential skill development (Eisner, 1972; Speck, 1989; Brewer, 1991). In the quest for free expression, teachers may fail to help individual children master the motor and cognitive skills necessary to accomplish genuinely creative achievements. Commenting directly upon existing practices, Hiller (1993, p. 35) noted that: "Unfortunately our progressive legacy based upon natural untutored development has resulted in artistic deprivation for generations of students."

Some arts educators have defined solutions to this problem. For example, Stokrocki (1986) described a form of patterning by examples. It is apparent, upon a close reading,

that such patterning is aligned conceptually to the phenomenon social learning theorists describe as 'participatory modelling'. Stewart (1990) has noted how upper primary students benefit in their ceramics classes from studying carefully the ceramic products of experts in the field. Within the terminology of contemporary psychology, exposure to such work products would be called a 'modelling stimulus'.

In the cognitive social learning view, "Creative achievements do not spring from a vacuum. They are built, in part, on the preceding innovations of others. Modeling probably constitutes most to creative development in the inception of new styles" (Bandura, 1986, p. 105). Specifically, models can depict the skills involved in creative production, both in terms of foundation skills and decorative elaborations. Models can exemplify underlying rules of conduct as well as showing ways to apply and work with such rules. Observers may combine different aspects from diverse modelling sources to form highly original behavioural variations. In short, if one has to be creative, then the opportunity to learn from creative and successful models becomes a valuable prerequisite input experience.

However, only a few controlled studies could be located which give direct support to the social learning approach (Harris & Evans, 1973; Zimmerman & Dialessi, 1973; Belcher, 1975; Landrenau & Halpin, 1978; Halpin *et al.*, 1979). Collectively, these studies demonstrated that exposure to peer models behaving creatively on laboratory tests (e.g. unusual uses, Torrance Tests) could serve to enhance selected aspects of performance on subscales of the same creativity tests. Whilst impressive, these studies do not easily translate into recommendations for classroom practice within the arts curriculum.

The present study sought to address this issue by conducting a study within the classroom context. Two comparable Year 1 classes were identified and taught a series of arts lessons focusing upon three-dimensional clay modelling. One class was taught using traditional non-directive curriculum practices, whereas the other class was taught using a structured treatment based upon participatory modelling and guided practice feedback.

Method

Subjects

The subjects were 56 students in two Year 1 (median age 6.8 years) classes in a suburban junior primary co-educational Catholic school in Adelaide, Australia. According to the school principal, the classes were not streamed and could be assumed to be comparable. Both teachers were highly experienced, fully co-operative and agreed to allow the primary researcher (AA) to take over the art classes of one class, this being determined by a coin flip. During the study, AA became well known to both classes as a visiting teacher. Through natural attrition, the number of students was reduced to 46 on the post-test. (See Table I for details of the numbers.) One subject left the study because of an injury, five children moved away from the school during the term and four were absent from the post-test.

Treatment

The design of the study entailed differential treatment in that AA became the art teacher for one class (interactive teaching group) over a 6-week period, taking the class

for one period (90 minutes) per week. The normal classroom teacher took the parallel arts lesson for the second (i.e. control) class over the same period, following her normal teaching practices and curriculum. This normal experience did involve some clay manipulation along with experience with other media, but the level of direct instruction employed was limited to information pertaining to the maintenance of children's workspace. The pre- and post-tests were all carried out by AA for both classes, with help of the class teachers in both instances. The pre-test was carried out in the first week, the post-test in the eighth week.

The interactive teaching treatment was multi-component and based directly on the principles of cognitive social learning theory applied to creativity (see Bandura, 1986, pp. 104–105). Within each lesson, the teacher (AA) specifically modelled techniques in using clay, employing a high level of directive verbalisation, along lines as suggested by Good and Brophy (1994). The focus was on both demonstrating specific skills and communicating a vocabulary used in describing clay modelling processes.

Emphasis was placed on four aspects: (a) that new skills are learnable if one focuses attention and observes carefully, (b) that new skills have to be tried out quickly, (c) that skills need to be repeated and (d) that once a skill is mastered it can then be used to make even more creative artwork. Deliberate efforts were made to incorporate these 'messages' into the lessons during both group presentations and individual feedback contexts. The lessons began with teacher-led demonstrations (10 to 15 minutes) followed by individual practice opportunities and feedback. The feedback emphasis was upon using the skills being taught rather than upon general encouragement.

Recording and Scoring the Artwork

In effect, the pre-test and post-test sessions were identical. All the students were asked to generate a clay model of their choice within a 90-minute period and to leave this behind at their desks. As there was ample time, the students finished individually. Before they left, in the post-test situation only, the students were asked to express the extent to which they were satisfied with their product. They were asked to respond to the following probe: "Some children really like modelling with clay. Other children don't. What do you think of your model?" (a) I think it is awful, (b) I think it's not very good, (c) I think I don't care about it, (d) I think I like it, (e) I think I like it a lot and (f) I think it's the best I ever did. These were rated 1 to 6 in analyses.

The clay models were photographed from two sides, front and left side, along with an identifying random number tag. The photographic slides were then submitted to three adult judges selected on basis of their expertise in knowledge of children's artwork. The judges were all professional artists in the area of three-dimensional art. All had worked with young children and are highly respected in their fields. They were contacted at the time the project was planned and all agreed to participate once the data were collected.

Before judging commenced, AA arranged to meet with the three judges as a group to discuss viable assessment criteria. The following procedures emerged from this meeting. At a later date, judges were asked individually to examine the photographs and rate each model on four artistic criteria: technical competency, decorative competency, aesthetic appeal and three-dimensional approximation. A five-point scale, 1 to 5, was used for each dimension. Each judge appeared comfortable with this procedure. Ratings were obtained with remarkable facility. The judges all appeared to have no

difficulties recording marks against the identifying numbers, in a manner blind to *both* treatment conditions and pre-post-test status.

Results

The three judges' ratings were found to intercorrelate strongly on overall tallies. The mean of such correlations was 0.65 on pre-test data and 0.75 on the post-test. On this basis, we decided to sum across judges such that on any one occasion a student's score could vary between 12 and 60.

An ANCOVA on post-test scores, with pre-test as covariate, indicated significant effects for treatment group ($F(1,41) = 32.9, p < 0.01$) (see Fig. 1) and for gender ($F(1,41) = 7.1, p < 0.05$). Subsequent means testing revealed that, although both girls and boys in treatment group increased scores from pre-test to post-test, the gain was relatively greater in the case of the girls (see Table I).

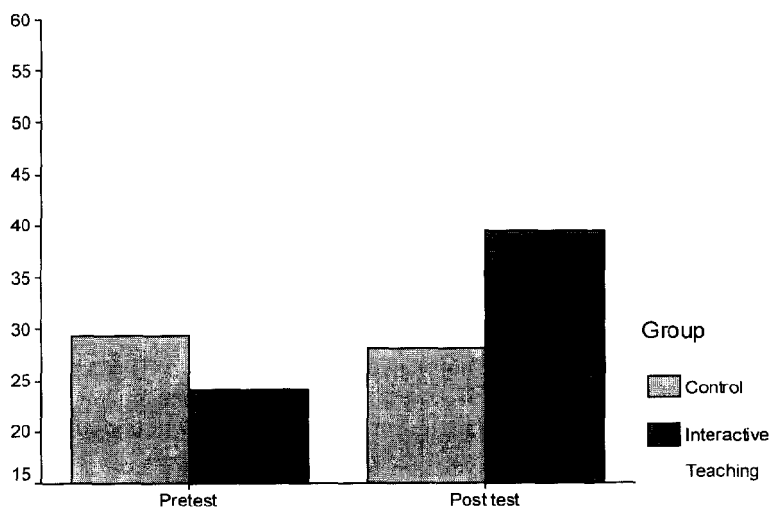


FIG. 1. Judges' ratings on creativity of artwork.

TABLE I. Judges' ratings on creativity for males and females in relation to treatment group

Group <i>n</i>	Pre-test	Post-test
<i>Control</i>		
Males (<i>n</i> = 11)	31.2 (9.1)	25.7 (5.6)
Females (<i>n</i> = 10)	27.4 (5.7)	30.1 (4.1)
Total (<i>n</i> = 21)	29.4 (7.7)	28.1 (5.5)
<i>Interactive Teaching</i>		
Males (<i>n</i> = 9)	25.8 (6.7)	36.7 (5.2)
Females (<i>n</i> = 16)	23.3 (5.6)	41.1 (6.8)
Total (<i>n</i> = 25)	24.2 (6.0)	39.5 (6.5)

The above figures represent mean scores with standard deviations in brackets.

Supplementary ANCOVAs indicated that significant effects attributable to treatment were found on each of the four subscales used by the judges (technical competence, decorative competence, aesthetic appeal and three-dimensional approximation: $F[1,41]$ s of 9.5, 16.2, 25.2, and 22.7, respectively, $p < 0.01$ in each case). At the post-test level, the overall treatment effect size (i.e. means difference divided by the pooled deviation of 8.3) was 1.37. Also, it was evident that when the students were asked to rate the quality of their own work on the post-test, differences between the interactive teaching and control groups did not emerge. That is, both groups were equally satisfied with their models (overall mean of 5.0 out of 6), even though the judges were clearly able to discern differences. It was also found that the students' ratings did not correlate significantly with judges' ratings.

Discussion

In this project, we were able to demonstrate that 6- and 7-year-old children increased the quality and creativity of their clay modelling work through approximately 6 hours of instruction and practice based upon cognitive social learning principles. Such changes were not in evidence in a second group of students taught in accord with the normal arts curriculum. Despite the fact that the quality of the students' work clearly diverged between the two treatments, it was apparent that on self-evaluative ratings the two groups did not differ. Both groups were equally convinced they had done well.

In field studies of this nature, the status of the control group experience can be problematic. A critic may argue that the findings demonstrate simply that students who spend more time on clay work produce better products. This argument fails to account for the fact that the controls did spend some time on clay work, but still failed to show measurable gain on assessments. (This statement applies to each of the four criteria when analysed separately.)

Also, it was apparent that the controls did receive high quality teaching. The control experience reflected curriculum practice as applied by an experienced and motivated teacher to a co-operative class. However, this experience was focused upon the general encouragement of free and creative expression in accord with prevailing philosophies, viewed by many as akin to 'best practice' and 'developmentally appropriate'. In contrast, the cognitive learning treatment targeted specific clay usage skills including those of 'wedging', 'coiling', 'joining', 'throwing slabs' and the variety of techniques employed in creating relief and decorative surfaces. That is, the skills that could be employed to extend creativity were articulated and demonstrated.

Did the treatment succeed merely in promoting technical skills which are useful, but insufficient for genuine creativity? This is an unanswerable question. But it can be noted that two of the assessment dimensions (aesthetic appeal and decorative competence) are components of what experts in this area do regard seriously as creativity. Notably, the dimension of aesthetic appeal has no direct referent in the physical stimulus. Instead, it represents a judge's personal response to the total stimulus. It should be noted that (a) this category was accepted by the judges as a valid criterion for assessment, (b) there was a high level of agreement in the judges' ratings and (c) the pattern of findings was virtually identical across all four ratings. As part of the procedures, AA briefly discussed the four dimensions with each judge, taking care to stress that aesthetic appeal was a subjective judgement. This aspect did not appear to trouble any of the judges, who, perhaps, have learnt to be confident in such judgements in their work.

The finding that girls were relatively more influenced by the treatment than the boys was unexpected and hard to interpret. Both boys and girls appeared to respond well to the instructional periods and both evidenced significant gains. The experimenter (AA) was a female and so this factor might be pertinent.

In essence, this study suggests that there are advantages to conceiving of classroom-based art education in terms of cognitive social learning principles. This study was conducted in the students' natural classrooms using the resources available to all teachers. However, what the average teacher may lack is access to the technical vocabulary and knowledge of the specialised art teacher. In the absence of sound pedagogical knowledge, a teacher has to fall back upon generalised encouragement tactics, that is, the skills involved in managing a warm and conducive classroom environment. But the present findings suggest that such positive climate factors are insufficient to produce high quality artwork.

In the present project, AA was able to draw upon several years of experience in teaching three-dimensional art to young children. Indeed, it was precisely this knowledge that enabled her to use social modelling and guided feedback in the present context. The control group had the benefit of a teacher capable of managing a high quality educational environment in which creative productions were encouraged and rewarded. But the treatment group students had the added advantage of a clearly directive, skills-focused model.

Finally, our findings are consistent with the analysis of the field by Weisberg (1993). From a cognitive psychology perspective, he has argued cogently against the notion that creativity is the product of extraordinary genius. Instead, creativity, even at its most elevated levels in distinguished individuals, reflects 'ordinary' psychological processes such as learning, reinforcement, analogous thinking, basic problem solving, persistence and knowledge acquisition. We would add that participatory social modelling can be viewed as one of these ordinary processes implicated in developing creative dispositions.

Acknowledgements

We are especially grateful to the students and their teachers, Ms Irene O'Callahan and Ms Jan O'Grady, for their enthusiastic participation. Dr Cathy Speck for her guidance with the methodology, and Ms Margaret Chandler for her assistance with data analysis. We are also deeply indebted to the three expert judges, Ms Liz Williams, Mr Peter Johnson and Ms Meredith Russell, who gave freely of their time and professional expertise.

Correspondence: Angela Anderson or Greg Yates, University of South Australia, St Bernards Rd, Magill, South Australia 5072, Australia. Email: angela.anderson@unisa.edu.au or g.yates@unisa.edu.au

REFERENCES

- BANDURA, A. (1986) *Social Foundations of Thought and Action: a social cognitive theory* (Englewood Cliffs, Prentice Hall).
- BELCHER, T.L. (1975) Modeling original divergent responses: an initial investigation, *Journal of Educational Psychology*, 76, pp. 351–358.

- BREWER, T.M. (1991) An examination of two approaches to ceramic instruction in elementary education, *Studies in Art Education*, 32, pp. 196–206.
- EISNER, E. (1972) *Educating Artistic Vision* (New York, Macmillan).
- GOOD, T.L. & BROPHY, J.E. (1994) *Looking in Classrooms*, 6th Edn (New York, Harper Collins).
- HALPIN, G., HALPIN, G., MILLER, E. & LANDRENAU, E. (1979) Observer characteristics related to the imitation of a creative model, *Journal of Psychology*, 102, pp. 133–142.
- HARRIS, M.B. & EVANS, R.C. (1973) Models and creativity, *Psychological Reports*, 33, pp. 763–769.
- HILLER, P.E. (1993) How should we teach art and why we should, *Australian Art Education*, 16, pp. 29–37.
- LANDRENAU, E. & HALPIN, G. (1979) The influence of modeling on children's creative performance, *Journal of Educational Research*, 71, pp. 137–139.
- SPECK, C. (1989) A depth art curriculum, *Australian Art Education*, 13, pp. 6–19.
- STEWART, R. (1990) The effect of 3D artworks made by adults on children's 3D form, *Australian Art Education*, 14, pp. 36–46.
- STOKROCKI, M. (1986) Patterning as an important strategy in fostering artistic development, *Art and Design in Education*, 5, pp. 225–237.
- WEISBERG, R.W. (1993) *Creativity: beyond the myth of genius* (New York, Freeman).
- ZIMMERMAN, B.J. & DIALESSI, F. (1973) Modeling influences on children's creative behavior, *Journal of Educational Psychology*, 65, pp. 127–135.