Title	Children's responses to questions about transformations and their relationship to strategies used in problem solving
Author(s)	Pamela Sharpe
Source	*ERA Conference 1992, Singapore, 24-26 September 1992*
Organised by	Educational Research Association of Singapore (ERAS)

CHILDREN'S RESPONSES TO QUESTIONS ABOUT TRANSFORMATIONS AND THEIR RELATIONSHIP TO STRATEGIES USED IN PROBLEM SOLVING

PAMELA SHARPE

Paper presented at the
Educational Research Association (ERA) - 6th Annual Conference
held in Singapore from September 24-26, 1992

CHILDREN'S RESPONSES TO QUESTIONS ABOUT TRANSFORMATIONS AND THEIR RELATIONSHIP TO STRATEGIES USED IN PROBLEM SOLVING

DR PAMELA SHARPE

NATIONAL INSTITUTE OF EDUCATION/NANYANG TECHNOLOGICAL UNIVERSITY

Introduction

The study stems in part from two earlier studies into parental involvement in pre-school education. Amongst some interesting findings were parents concerns and uncertainties about their roles in facilitating the learning experiences of their children when not in school. This paper describes the preliminary attempts to sensitise parents and teachers to current views on appropriate learning environments for young children, in particular, the strategies they use to make sense of their experiences. The adults' roles as tutors focus on a interactive process, where the tutor sets the challenge and together they resolve the mystery, the tutor giving structure and direction to the experience. It is anticipated that if parents and some teachers understand the basis for this approach to tutoring, their support and encouragement will relieve the potentially damaging pressure to " succeed at all costs ", a current dilemma for parents of children in Singapore.

Preliminary Investigations

Parents concerns about availability and quality of pre-school education continue to be expressed in the meritocratic climate of Singapore. It was revealed in the first study, (Sharpe 1989), that a traditional approach to learning by direct instruction, rote learning, homework and regular assessments, was the preferred norm. This study, was largely concerned with assessing parents needs and expectations of pre-schools and their teachers. A survey of parents needs and expectations, appeared to support Tizard's findings, (Tizard et al, 1981), that parents are ignorant of educational aims, practices, and priorities, largely because teachers are insufficiently sensitive and explicit when communicating information to parents. The Singapore study concluded that improved cooperation between parents and teachers was necessary, and attention to a process of listening, negotiating, and compromise, through parental involvement in pre-schools seemed desirable, (Little and Smith, 1971).

Elsewhere successful home programmes have relied much on the schools' initiation, and have been largely for " at risk" or " disadvantaged" families.(Cameron 1985, Griffith's and Hamilton 1984, Powell 1988, Jowett et al 1991). Much of their content has focused on reading programmes, and imparting appropriate

attitudes, conduct, use and understanding of language, and their relationship to school achievement. Such programmes it is claimed, elicit a protective and secure learning environment rather than improve reading skills per se. (Hannon 1987). Clearly such merits may well be conducive to the needs of parents and their young children in Singapore. Nevertheless, their usefulness especially in terms of their relationship to school achievement would have to be demonstrated. Additionally the content would need to be appropriate and not comprise mere rehearsal of school work, which may well contradict the school's efforts. A major aim of the current research into parental involvement in school is to devise a suitable programme which may satisfy the needs of the majority of parents and maximise the potential of their children.

Strategies for Practice.

Goode, (1987), warns of the dangers of teachers and researchers patronising parents. He suggests that their practices rather than their personalities should be considered. He proposes that the kinds of questions parents pose, how they organize activities for their children, and how they appraise themselves, are practices more worthy of investigation. Additionally, any teaching programme designed for young children would need to take account of their developmental needs, the resources available, and the competence of the teacher/tutor. There needs to be a commitment on the part of the teacher/tutor to the success of the programme, and, a willingness to be flexible about outcomes, and, to modify provision and expectations. The previous study (Sharpe 1990), reported the need to familiarize parents with knowledge about qualitative differences in the development of children's thinking and problem solving strategies.To convince them that learning and development take place in a materials rich environment with opportunities for self initiated activity, and, the importance of play in problem solving and creativity. (Bruner 1972). The evidence for the importance of environmental influences was revealed by Bruner, and reported in Sylva et al, (1980). Such influences were evident in the form of eliciting goal directed behaviour which it is claimed, is implicit in building, drawing, and board games and this is related to goal directed activity in school attainment. Highlighting such a finding then, might well persuade parents of the benefits of these types of experiences. Furthermore, it was noted that an adult's role in motivating children to think, express views and explain actions is crucial in play and is most likely to occur when the adult is a facilitator. (Sylva et al op. cit.).

What then do adults/tutors need to know about problem solving?

Information on Problem Solving

Wood (1988), reviews the research proposing the collaborative role of adults in supporting children's learning. Challenging activities which tap the child's existing repertoire of skills and knowledge, which, when made available, are more likely to be effective in new learning, he concludes. To enable effective collaboration, a noteworthy tactic is to provide tutoring in problem solving, (Wood et al, 1976), with the idea of the "expert" passing skills and knowledge to another. This "scaffolding", (Wood, op.cit.), involves such activities as questioning, correcting errors, showing approval, coaxing, and providing supportive experiences which children grow to interpret, extend, and understand. Other research,(Schweinhart et al, 1986), points to the advantages of programmes for young children which stress relationships with responsive adults who encourage competence and decision making,(such as the "High Scope" programme), and the positive long term results over other programmes.

For the research to date, reported in this paper, it was envisaged that if collaborative efforts between adult and child are encouraged, this will form a sound basis for an appropriate programme.

A Place to begin.

To date, the planning and preparation of the programme has centred on teaching a group of adults to observe and record the behaviour and problem solving strategies of young children as objectively as possible. The purpose was to investigate whether, given the opportunity, the group are able to develop realistic developmental expectations, observe individual differences, and note temperaments, interests, and attention spans. In this regard, Saljo and Wyndhamn's study (1990), on the problem solving competencies of 12/13 year olds, suggests that success appears to depend on the amount of interest and enthusiasm students bring to the tasks and the relevance to real life situations.

A group of intending teachers, with little or no experience of young children, or knowledge of child development, attended a course, designed to develop their understanding of children's problem solving strategies. After some training in observing children, using running records of happenings in "event sampling" and "time sampling" and the use of anecdotal records and case history information, students were introduced to aspects of developmental explanations for problem solving. They were encouraged to try out baseline activities to test conservation, understanding of relational, comparative, and differentiated words and phrases, understanding of position and direction, time and cause and effect, through questioning, discussion, posing further challenges and rephrasing questions. Next, students were encouraged to provide problem solving activities and experiences, which comprised board games and puzzles, construction activities,

collage, listening to stories involving challenging situations, treasure hunts/trails, and every day activities where challenges were identified. After making detailed observations, records of problem solving and related activities were kept, as were detailed accounts of the childrens' responses to these. Where possible, students were asked to compare two children using both common and differentiating variables, so that any changes which may occur in the children's understanding, may be explained, or accounted for.

Some relevant Observations.

As the students wrote up their Case Study Reports, they were asked to complete a questionnaire, designed to evaluate their views on their understanding of children, the appropriateness of their observations, the appropriateness of their activities, and, whether they felt competent in interacting with children. A summary of their comments is shown in Fig.1.

An analysis of the students' detailed observations revealed some interesting findings. It is clear from Fig 2, that a better understanding of young children in terms of the kinds of circumstances in which they may be guided to problem - solve effectively, is exposed. The students' observations about their tutoring role (Fig 3), clearly shows their concerns about the kinds of assistance which children need at different stages in their development; the kinds of questions which elicit the appropriate responses; the importance of hands-on activity and opportunities for decision making; the effectiveness of presenting tasks in small steps, and guiding rather than using tasks as obstacles to be overcome; praise and appropriate feedback is also noted; the encouragement of guesswork is "out", and explanations are "in".

Thus for future teachers, such observations and beliefs about children might positively affect their competencies in the classroom. What in particular, though, has emanated from this initial investigation?

A number of parameters warrant further investigation. In particular, the kinds of questions most effective in assisting problem solving situations when posed to children of different ages; the kinds of challenging and problem solving experiences most likely to sustain interest and enthusiasm with children of different ages and which appear to elicit new understanding in different children; finally, the characteristics of tutors and children who appear to interact with positive results.

Conclusion

It was noted earlier, that school attainment is related to play which is goal directed, and, when the adult is a facilitator motivating children to think, express themselves, and explain their actions during play. (Sylva et al. 1980). Additionally, the adult as tutor is an effective collaborator in children's learning when she provides challenging activities which tap existing skills, providing supportive feedback and opportunities for decision making during problem solving activities, (Wood et al, 1976). Thus if the collaborative efforts of the students as tutors to their children, using challenging play and problem solving activities, proves to be successful, then such tasks and experiences may work for parents as collaborators in their children's learning. The next area of investigation is to consider the types, and order of questions which elicit effective responses to questions about how children solve problems.

FIGURE 1

Summary of students' responses to questions about the course on tutoring problem solving.

* Chose course
    * to learn how to observe
    * to relate better to children - so long since childhood
    * to know how to choose relevant activities
    * to understand how children think
* Improved understanding
    * now know what to look for
    * theory becomes meaningful
    * need much more time yet
* Of observing
    * concrete materials needed
    * ask appropriate questions in natural settings
    * must be objective - avoid personal perceptions of childhood
* Of differences
    * think differently at different ages
    * one or two months difference in age and they are so different in their thinking
    * different backgrounds make a difference
* Of activities provided
    * not yet - too frightened to interact
    * need to continually think up and rephrase questions
    * to capture attention - these must be meaningful
    * you can do lots of simple things if you think about it
* What else do you need?
    * more practice observing
    * more practice talking and asking questions
    * more guidance and structure
    * more opportunities to discuss and check I'm doing the right thing
    * how to help the slower ones

FIGURE 2

* Before intervention 4 students reported that children were afraid to answer questions for fear of being wrong.

* Very young children gave personal preferences when they were uncertain.

* Some children, especially the younger ones, rushed into tasks without thinking first. Older children observe first.

* If children are not ready (developmentally) for a task, no amount of tutoring will change their responses.

* Interactions on age related peers have a positive effect on children's ability to solve a task or respond to related questions.

* Children will only interact when they trust an adult.

FIGURE 3

* Problem solving improves when children are interested, given clues and told what to look for.

* When tasks are broken down into small steps, problem solving becomes easier.

* Positive clues confirm beliefs about cause and effect, and encouragement helps generalization of processes involved to related activities. Give explanations rather than expect them to guess.

* Children make discoveries when involved in hands on activities and when given opportunities to make decisions.

* Children can learn to think when given guidance, and when they can relate to previous experiences.

* Structured questioning is effective for problem solving: prediction, judgemental, explanation, and check questions.

* When language and previous experience are limited, peer tutoring is effective. Additionally, children are less likely to disagree with and give their views to an adult.

* Adults can change children's misperceptions with appropriate structured guidance.

References

1. Brandt, R., (1989). Parents and Schools: A Conversation with Joyce Epstein. **Journal of Association for Support and Curriculum Development: Educational Leadership**, 47(2), 24-27.

2. Bruner, J.S. (1972). The Nature and Uses of Immaturity. American Psychologist, 27, p.687-708.

3. Cameron, S., (1985). Parents as Educators: learning from Portage, in: Working together with children with special needs: Implications for preschool services, eds E De'ath and G. Pugh. **Partnership Paper 3**. National Children's Bureau, London.

4. Clark M. M., (1988). **Children Under Five : Educational Research and Evidence**, London, Gordon and Breach.

5. Goode, J., (1987). Parents as educators in Bastiani, J. (ed), **Parents and Teachers (1) : Perspectives on Home-School Relations**, Windsor, NFER Nelson.

6. Griffiths, A., Hamilton, D., (184). **Parent, Teacher, Child Working together in children's learning**, London, Methuen.

7. Hannon, P., (1987). Teachers' and parents' experiences of parental involvement in the teaching of reading in: **Early Education: The School years**. Cohen A. and Cohen L. (Eds), New York, P. Chapman publications.

8. Jowett et al (1991). Building Bridges. London: NFER.

9. Lindle, (1989). What do parents want from Principals and Teachers? **Journal of Association for Support and Curriculum Development: Educational Leadership**, 42 (2), 12-14.

10. Little A., & Smith, G., (1971). **Strategies of**

Compensation: A Review of Education Projects for the Disadvantaged in the United States. Paris: Centre for Educational Research and Innovation for Economic Co-operation and Development.

11. Powell, D.R., (1988). Emerging Directions in Parent-Child Early Intervention in Powell D.R. (ed) **Parent Education as Early Childhood Intervention Emerging Directions in Theory Research and Practice**, Annual Advances in Applied Developmental Psychology Vol 3, New Jersey, Ablex Publications.

12. Radin, K., (1972). Three degrees of maternal involvement in a preschool programme: Impact on mothers and children, **Child Development**, No 43.

13. Saljo, R., Wyndhamn, J. (1990). Problem-Solving, Academic Performance and Situated Reasoning. A study of joint cognitive activity in the formal setting in Br. J. educ. Psychol. 60, 245-254.

14. Schweinhart, L.J., Weikart, D.P., Larner, M.B. (1986). Consequences of Three Preschool Curriculum Models Through Age 15, in Early Childhood Research Quarterly, 1, 15-45.

15. Sharpe, P.J., (1989). Catch them when they're young: A study of teachers and parents of young children with early learning difficulties. Unpublished paper presented at O.M.E.P. Conference and XIVth World Assembly 11 July 1989, University of London Institute of Education, London.

16. Sharpe, P.J., (1990). Are parents and teachers able to work together in the best interests of preschool children in Singapore? Unpublished paper presented at International Council on Education for Teaching, 27-31 July, Singapore.

17. Smith, T., (1980). **Parents and Preschool**, London, Grant McIntyne.

18. Sylva, K., Roy, C., Painter, M. (1980). Child Watching at Playgroup and Nursery School. London: Grant McIntyre.

19. Tizard, B., (1977). **No Common Ground**. **Times Educational Supplement**, 22nd May.

20. Tizard, B., (1978). Carry on Communicating. **Times Educational Supplement**, 3rd February.

21. Tizard, B., Mortimer & Burchell B., (1981). **Involving Parents in Nursery and Infant Schools: A resource book for teachers**. London, Grant McIntyne.

22. Tizard, J., Schofield, W.M. and Hewison, J., (1982) Collaboration between teachers and parents in assisting children's reading. **British Journal of Educational Psychology, 52, 1-15**.

23. Wood, D. (1988). How Children Think and Learn, Oxford, Basil Blackwen.

24. Wood, D., Bruner, J.S., Ross, G. (1976). The Role of Tutoring in Problem Solving in J. Child Psychol. Psychiat., Vol.17, pp.89-'100.