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# The Design and Production of Print and Media Materials for Children aged 4 – 11

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This topic will be approached selectively in order to tease out some key features for attention. They are firstly, the purpose of media and print materials as aids to children's learning; secondly, some aspects of popular views about how children depend upon their experiences to make sense of their world; and thirdly, the appropriate principles and guidelines for the practice and implementation of the design and production of print and media materials for children aged four to eleven.

## **The Use Of Multi-Media Materials**

The last two decades have witnessed radical changes in the manner in which teachers plan, present and evaluate the learning experiences for young children. In general there has been a move away from teacher dominated activity towards child-initiated activity. Rather than reiterate a description of this lengthy and sensitive trend, it will be useful to focus on the key features of change which have most strongly influenced planners and decision makers.

The influence of developmental psychologists, educators, and those concerned with research into children's learning and development has been impressive. One such influence has been the provision of structured materials and ready – prepared resources for teachers of young children. This has freed the teacher to some extent to focus on the child initiating his own learning through exposure to a materials-rich environment. Following prescribed procedures, teachers are provided with blueprints for planning and presenting meaningful learning experiences. In Britain, the development of the National Curriculum with its emphasis on a broadly based and balanced provision with regular assessment of attainment targets for all children from 5 to 16+ requires teachers to individualize the

programme according to needs. In the US programmes such as High Scope, Distar, and Headstart have provided specific types of provision according to individual needs of children. Such programmes have done much to redirect educational provision for young children. Notable is the emphasis on multi-media resources organised efficiently and effectively in instructional packages, known as learning centres, centres of interest, resource libraries, pedagogical centres, teachers' resource centres etc. In Singapore the emergence of the Preparatory Year Programme has likewise relied much on multi-media packages to augment the effective presentation of meaningful learning experiences for 5 year olds.

The Preparatory Year Programme is designed to provide 5/6 year old children with experiences which tease out activities based on a view of learning and development which stresses an interest – centred approach to educational provision. Such an approach focuses on the importance of the theme and related topics in directing the scope and sequence of activities. As with the British National Curriculum, there is a stress on core and foundation subjects, where subject divisions are retained and provide a knowledge base from and through which the topics for study are developed and extended. Likewise, appropriate resource materials are vital facilitators.

These include a multi-media collection of teachers notes, slides, cassettes (audio and visual), transparencies, visual coloured masters, story boards, motivational charts, lists of selected references, activity cards and sheets. Such materials enable teachers to motivate, and sustain children's attention, aid recall, extend understanding, application and generalization of ideas, facts, and inferences, in order to prepare children for Primary 1. Likewise provision for 6 to 8 year olds, is along similar but more developmentally appropriate lines. How effective though are such packages, materials and teachers' guides for the teaching of young children?

## **The Changing Role of the Teacher**

Recent research (reviewed in Wood, 1988) has influenced the choice and redesign of curricular provision for 5 to 8 year olds in

Britain. Such government publications as **The Curriculum from 5 to 16 (1985)**, have stressed the importance of oral and listening skills, in addition to reading, writing, number, investigation and problem solving skills. In Singapore a similar trend has emerged. Not only does this necessitate changes in programme activities and experiences, but changes in the physical provision. What then are the expected changes in resource materials, physical space, time and duration of activities? Additionally, will the teacher's role change, and if so how?

Before addressing these crucial questions it will be useful to consider some background to some fundamental and related issues which may affect possible changes to classroom practice. How and under what conditions has recent thinking questioned traditional views on how young children can achieve their potential?

Teachers and others in education have over the years been strongly influenced by Piagetian theory. But there have been major difficulties in translating the theory and research findings into classroom practice. This has been largely because of the theory's location in what is commonly termed the progressive view of education, with its emphasis on an interest centred curriculum. The stress on stages in the development of children's thinking, and the inherent possibilities of guiding children through these, leads educators to question how a child acquires knowledge at a particular stage, and relatedly, how teachers might intervene. Furthermore, traces of maturationalism remain embedded in the minds of early childhood educators resulting in an opposition to traditional methods, with the consequence that a constructive philosophy identified with progressivism has failed to develop. However, unlike earlier contributors, Rousseau, Dewey et al, Piagetians have been directed to the study of knowledge and the psychological development of the child.

Although Piaget was not concerned with the implications of his theory of development for education, his observations of how children develop thinking skills have been influential, in particular the qualitative differences in the thought processes of 5 and 8 year olds. He makes a clear distinction between "figurative" aspects of knowing, (characteristic of 4/5 year olds) and, "operative" aspects of

knowing (characteristic of 7-8 year olds). The former is concerned with static configurations (mental images resulting from reproductive thought, the product of active manipulation with concrete objects). This involves not mere physical actions but anticipatory thought. Operative aspects involve the child abstracting knowledge and information from experiences, (Piaget 1964). It has however been the role of researchers into the theory to apply its prescriptions for educational practice. Kamii, in Schwebel and Raph (1974), links the distinction between the manner in which the child constructs physical/figurative knowledge, or logico – mathematical knowledge, to learning by discovery and learning by invention. Kamii claims to have demonstrated that timely interventions by the teacher enabling the child to discover and/or invent, cause the child to abstract from his knowledge what he has gleaned from his physical experiences, his discoveries, and he may then infer and invent as a result of the coordinated actions taking place in his developing logico-mathematical experiences. Such emerging competencies are typical in 4 to 8 year olds, and are the key goals towards which educators aim in devising developmentally appropriate experiences.

However, the interpretations put on Piaget's view of how knowledge is acquired have not remain unquestioned. Others have pointed to serious omissions. Notable is the neglect or misunderstanding of the role of memory, attention, and concentration in explanations of how children progress through the stages. Adaptation, motivation, and experience are the essentials according to Piaget (1964). However explanations of these processes for teachers require clarification if they are to be meaningful and useful to teachers. Explanations of the way children learn have been likened to "information processing systems" with, "limited channel capacities." Bryant (1974), suggests that explanations for children's inability to draw inferences or solve seriation problems, (competencies inherent in Kamii's: inferring, discovering and inventing), can be explained in terms of an inability to select, store and retrieve requisite knowledge and information, rather than describing the child as pre-logical (concerned with figurative knowledge.) According to this view, children need to memorize what they discover, from examining, comparing and investigating problems, so that they can make effective use of the information. Four and five year olds are, by their very nature unsystematic in their time

on task. Unlike eight year olds, they are unable to plan ahead, and practise successful manipulations spontaneously. Rehearsal, or practice, it is claimed, is a powerful tool to memory, as is organization of information into structured and meaningful clusters. According to this view of how children learn, learning can be incidental as well as the result of programming, but the teacher's role is clear: children of four and five often need to be guided in what to observe, what to attend to, which spatial, causal and temporal cues to take cognizance of, so that acquired knowledge, skills, attitudes and values are structured and stored in their memories. These processes require the teacher to set appropriate tasks, arrange suitable materials, remind, and prompt attention to cues and events in a systematic way, but one which allows for child initiated activity at the same time. Teachers also need to be sensitive to the qualitative differences in the way children respond to questions. When asked: "are they the same?" four and five year olds compare very few features of the situation whilst seven and eight year olds make use of previous experiences and knowledge and show foresight. Other kinds of questions which probe more could stimulate the child to reconsider, e.g. "Why do you think that?" "What do you think would happen if?" This causes a conflict in what he thinks and how he might explain what he thinks. It prods him into looking for other solutions perhaps. Thus a materials rich environment with a wealth of appropriate experiences could enable younger children to free themselves from constructing mere figurative knowledge which binds them to egocentric thought, and enable them to extend discoveries and problem solving. Likewise, such experiences for older children require tasks and experiences which cause cognitive conflict, where they need to resort to hypothesizing, testing, refining, and modifying in order to progress. This self-initiated activity must be accommodated for when teachers plan.

More specifically, materials, resources, and programme content need to be planned by teachers from the child's point of view. Those of us concerned with maximising children's learning and potential need to be clear about the kinds of conditions which best facilitate this.

A materials-rich environment provides for the processes which children use to create their own knowledge. How he knows rather

than what he knows is what teachers need to observe and focus attention on. For example, as Holt (1989) explains, children learn about letters, sounds, words, numbers, facts etc. not in the way adults learn. They identify letters in patterns in pictures, in signs, in labels on everyday items and objects. Letters are shapes, but not all shapes are letters, not all combinations of letters make words, shapes and objects are often used for more than one purpose. By doing something which we adults know as simple classification or seriation, the young child is learning about language, communication, number, space, time, and causality, not by following teacher directed instructions necessarily, but independently in his own time and at his own rate. Children expand their vocabularies by listening to the conversations of others, by deriving meaning from using words in context. They learn to enjoy books magazines and comics by noting that letters stand for sounds, and that some words that look alike may sound alike. Writing is putting speech on paper, when the sound of the word changes, the letters may change.

It is clear that understanding how children see things differently at different periods in their lives needs to be understood. If children can be encouraged to create their own learning aids, they may better understand what they are expected to know in school. For example producing their own journals, books, charts, storage boxes, folders, cards, worksheets, homework diaries, gives a purpose and meaning to their learning experiences. Giving eight year olds a small light bulb, a battery and some wire will enable him to learn more about electric circuits than asking him to examine a torch. Provision of suitable materials for a small circuit board will enable him to extend and generalize this experience. If ongoing experiences are linked to previous ones systematically there is no need for teachers to give too slavish regard for recording results neatly, the child has done this already, and made a meaningful note in his memory. Similarly, the way in which 4/5 year olds come to know, understand and use number concepts is very much influenced by the teacher's presentation of the subject matter whether or not it matches his way of interpreting the information. Holt (ibid), argues that young children actually see number names as adjectives, rather than nouns, e.g. one hat, two hats, three hats, which describe a hat in a different way, rather than meaning x number of hats. Thus counting objects using the same object can be very confusing. Holt suggests that the activity

should be described in a time sequence: "Here we have one hat, now another hat and another, so we have lots of hats, altogether we have 4." Similarly with ordinality, a child needs to see the relationship of first to second from his own experience, what does first, second, and third actually mean? If the teacher uses a time sequence using the words then the child may see the meaning and be able to use the terms meaningfully later on. Additionally, presenting numbers of objects for knowing quantity, is only useful if the child observes the same number in a variety of patterns and configurations. He will only understand if he uses number names to describe the different patterns of the same numbers. Here a number name refers to a size of a group, an ordinal number refers to a place or position in a group. When adding and subtracting are involved, it is important to teach maths facts as patterns of things that can be re-arranged, regrouped. It is likewise important that children discover this than learn facts. They need to make discoveries with real things before moving to abstractions, as has been noted. Multiplication and division can be discovered in the same way. Using grids has been shown to be far more influential in teaching multiplication tables, than memorization of tables. (Scottish Primary Maths Syllabus). By having 7/8 year olds do "10 a-day", an individualized maths programme, they discover and abstract in their own time at their own rate. They can learn from their own mistakes, check their responses and ask questions to help understanding. The national curriculum in Britain seeks to promote such independent self-initiated activity, and sees it as part of the key stages R, 1 and 2, attainment targets, along with knowledge and understanding, skills, and attitudes to school work.

What then does this refocussing of content method of presentation and assessment of outcomes mean? For the teacher in Britain, this means using previously prepared resources and materials, which readily facilitate the teaching of the core curriculum areas, and at the same time modifying the provision in terms of the stated attainment target for each child. Clearly, merely following a blueprint will serve little purpose, so teachers need to monitor the attainment of each child within the "whole" curriculum and modify content and presentation accordingly.

## Some Prescriptions For Current Practice

In order for the requisite knowledge, skills, attitudes, and values to develop in young children, it is clearly important that teachers and planners are sensitive to learning needs of children. This means there must be a focus on learning and understanding. This involves knowing that there are developmental differences in young children's thinking. To understand fully what is being taught means children must know and use referents. These are the objects or experiences represented by signs, words, or labels. These enable children to represent knowledge figuratively so they can infer and make discoveries. Next, they need to solve contradictions in their experiences. That is knowing that even when two objects are unlike they may share some common properties, e.g. dogs and cats are not alike but they are 4 legged domestic animals. Finally, making connections, or generalizing information to other experiences and events, enables the child to further infer, discover, and invent, prerequisites for operational thought. All this results from experience and independent self-initiated activity, where the teacher's role is to monitor guide and facilitate.

Materials and resources must therefore be prepared and used in such a way that the child is motivated to discover, infer, invent, hypothesize, test and revise. They must hold attention, be recurrently stimulating. Uncomplicated and uncluttered, with the minimum amount of unnecessary information so that the aims are very clear. Materials should be used by the teacher in the way they were intended to be used, that is, to convey messages, provide for follow up activity, reflect children's current interests, and be closely tied to their own experiences.

More specifically, appropriate multi-media resources will serve the purpose for which they are planned, if they help the teacher to guide the child through knowing referents, solving contradictions, and making connections. This may involve: auditory discrimination activities, auditory memory activities, visual discrimination activities, visual memory activities, following and giving directions, phonic activities, whole-language activities, activities to encourage reading, context clue activities, understanding content activities, main idea activities, sequencing activities, drawing conclusion activities,

listening activities, writing activities, spelling activities, creative language activities, maths and number games, maths processes activities, activities involving money operations, time sequencing, estimation, creative problem solving, science, nature, and environment activities. Essentially all of these should involve a focus on active involvement with hands-on materials, which the child can select and use with the teacher's guidance. Such provision is by no means achieved easily or quickly. Teachers should therefore be encouraged to create, modify or adapt those materials and resources which are the most suitable for their teaching and their children.

## Conclusion

This paper has attempted to show that planning and providing appropriate print and media materials for children of 5 to 8 years old, is no easy task if these are to be effective. These must be of use to the teacher in such a way that they augment rather than replace her contribution as a teacher. They must be planned according to the developmental needs of the children for whom they are intended. They must be sensitive to differences in children's needs, interests, attention spans, organizational abilities, and the needs of the theme or topic under consideration. Some very useful materials and resources are being planned, but, for these to be effective learning aids, they must be used by teachers who are competent and confident to apply, modify, extend, adapt, replace or change them if and when required. Abilities to change and be flexible are necessary ingredients of planning, preparing, and teaching.

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