Teachers are more likely to succeed in using a new curriculum if they plan their own gradual changes.

The Transitional Curriculum

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During the past several years I have attempted to promote curriculum change by focusing on *classrooms* within a school. I work mostly with staffs who have chosen to implement, adapt, or create a curriculum to satisfy a need or solve a problem. They possess, then, a good grasp of the ideology of the proposed changes and generally agree with the curriculum's assumptions about education.[1]

In one school each teacher identified the changes in content and process he or she wished to make within a framework established by the whole staff. Using the transitional curriculum that follows as an illustration, the teachers listed a series of small steps they could use as a bridge between the old curriculum and pedagogy and the new patterns, roles, and relationships.

The transitional curriculum illustrated here is one a teacher might develop to implement an elementary science curriculum featuring an inquiry approach with the pupils handling materials. Many teachers have tried this type of curriculum and encountered chaos and failure. In the complete dearth of help with *classroom* implementation and change, they have attempted too much too quickly. Moving from traditional classroom transactions—where the teacher is dominant and pupils are passive—to a state where pupils interact with materials, supported by a teacher who arouses curiosity and provides for active enterprises, is a phenomenal change. It requires not only new skills but changes in attitudes toward knowledge, learning, and communication patterns; interaction with materials; and sharing and working in groups. This is impossible to achieve at once.

> "This transitional curriculum is not a mechanistic recipe to be followed blindly. . . ."

Using a series of steps by which teacher and pupils gradually learn new roles is consistent with sound principles of learning. One such principle is to start from where the learner is. In this case, the learners are both pupils and teachers. Another is to provide for learning at the student's pace and in increments that allow for success.

This transitional curriculum is not a mechanistic recipe to be followed blindly; it is simply a heuristic device teachers can use to plan their own gradual change.

A Transitional Curriculum for Changing Science Classroom Transactions[2]

Phase One: Establishing Two-Way Communication.

The objective of this phase is to establish two-way oral interaction between the teacher and children, and to encourage children to think.

—*Science using a text.* Traditional science teaching consists of lectures and recitations based on the text. Pupils listen, read, write, and recite information.

—*The text and questions.* The first step in moving toward open transactions is to introduce and establish two-way communication. Without changing any materials or the classroom set-up, the teacher may, after the usual presentation from the text, introduce a questioning approach that gives as little information as possible. The pupils, having been informed of their new role, are given time and encouraged to respond and establish two-way communication. The number of questions may be gradually increased until a Socratic style is reached.

Phase Two: Eyes On

The objective of this phase is to change the focus from the text to real events and materials but without pupils manipulating the materials.

—*Film demonstration.* A suitable activity for this step is a film loop called "Ice Cubes" from the Inquiry Development Program.[3] The film shows an ice cube floating in one container of liquid and sinking in another container of apparently the same liquid. After seeing this discrepant event, the pupils solve or explain it by asking the teacher questions that may be answered by a "yes" or "no." From the answers, students form their own explanations of the event. This high prestructuring of roles reduces teacher information-giving and encourages pupils in speculative thinking and questioning.

—*Live demonstration.* Now the teacher must begin to develop some personal manipulative skills. In "Sink and Float," from the Elementary Science Study Curriculum,[4] household items are presented to the students, who predict whether the objects will

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sink or float in a container of water.

Phase Three: Hands On

The objective of this phase is to introduce pupils to direct manipulation of materials.

—*Each child handles materials.* Each pupil is given a battery, a bulb, and one wire, and is asked to find as many ways as possible to light the bulb using those materials.[5] Having built up pupils' intellectual inquiry skills and weaned the teacher from recitation, materials are now placed in pupils' hands. This is a critical point; if the teacher is short of materials, the children will have to work in groups. The excitement of having something to hold, plus having to share it, often leads to loss of self-control. Therefore, it is essential to have enough materials at this stage for each pupil. Simple materials and a simple task guarantee success for this activity.

Phase Four: Building Group Skills

The objective of Phase Four is to build group skills.

—*Pairs.* The most appropriate activity for this step is one that builds on existing familiarity with materials and tasks. It is logical, therefore, to

use another battery and bulb activity from the Elementary Science Study. After students have finished the task in the previous phase, they work in pairs to discover how many different ways they can light two bulbs using their combined materials.

—*Trios.* The previous step used a natural approach to grouping with relatively undefined roles. Enlarging the group to three members necessarily introduces the concept of division of labor and group roles. At the beginning of group work, neither the children, who have not yet developed the skill of designing and ascribing roles, nor the traditional teacher, who is used to being the focus of attention, are easily able to define their roles. They need a supporting structure until these skills have been developed —one that provides highly specified roles while promoting group interaction, such as the simulation or game. An appropriate activity for this step is a communications game using a set of blocks in various sizes, shapes, and colors.

Two identical mixed sets of blocks are given to two group members. One pupil, out of sight of the second pupil (use a screen or have the pair work back-to-back), builds a pattern with the blocks. Each time a block is added to the pattern the pupil describes the move as accurately as possible so that it can be duplicated by the partner. The third child observes and takes notes of the proceedings, without giving any clues as to

the accuracy of descriptions or moves. It is the third child's role to take part in and add to the discussion of the similarities and differences in the two patterns after the game has been played for a while.

—*Quartets of children with complex materials.* The Mystery Powder[6] activity involves the use of cooking powders from the kitchen. Children record the appearance and taste of each of several powders as well as the results of other "tests" involving water, vinegar, iodine, alcohol, and heat. They build a matrix of properties of the powders in order to identify mystery powders that consist of mixtures of the original powders.

This activity is relatively complex, involving multiple materials, and requires the members of each group to decide on what role each should play. The teacher's role necessitates carefully distributing materials as well as giving step-by-step, clear, written and oral instructions.

Phase Five: Implementing Pupil Intentions

Phase Five focuses on a gradual increase in pupil participation in making decisions about how and what to learn.

—*Children choose how to solve a given problem.* This step provides pupils with a problem to solve with the aid of some basic materials. Small groups of pupils discuss and decide how to go about solving or investigating the problem. A task that fosters this type of decision making goes as follows: students are given paper, clay, metal foil, and other materials to see who can make the best boat. In small groups, they cooperatively decide their own strategy and minor objectives for reaching the goal.

—*Thematic approach: children set their own task within a given theme.* Having conducted several activities within which children have, in conjunction with the teacher, developed the skills to specify short-term objectives and strategies, a thematic approach may be used. Much broader in scope than the previous task, this approach allows pupils to select a specific task within a general theme. The teacher might choose the theme of "your bicycle" as a project. This topic should be interesting to the class as well as an important concern for road safety. The teacher may introduce the theme to the children by way of a curriculum web, which presents possible investigations and which they might expand before selecting their own mini-themes. Children who are interested in similar things have a natural reason for working together.

Facilitating Teacher Creation and Use of Transitional Curriculum

The transitional curriculum, whose objectives focus not only on curriculum content but also on changing roles and transactions in a gradual way, can provide teachers with time and resources to negotiate and develop their plans for change within school-based frameworks. The phases and steps illustrated here represent interim goals that may be *individually planned* and *mutually negotiated* between each teacher and others who can affect desired change. If teachers are to be involved in curriculum development, they *must* be involved in developing plans for changes in their own classrooms. Perhaps then we can avoid the classic change symptom (and this is not meant to be pejorative to the teachers): "It won't work in my classroom. It's not practical. I tried it *once* and there was chaos!"

The crucial objective of the transitional curriculum is to make only a small intended change each time, uncomplicated by other considerations. Small steps will accrue to create a more significant change, as the teacher and pupils build the necessary skills. A new step or phase is not attempted until the class can function comfortably with the skills of the previous step.

Obviously the current step a class is learning cannot be practiced all the time; other teaching strategies are used as well in a cumulative fashion. But it should be practiced as often as the teacher encounters an appropriate opportunity in the curriculum process and content. Attempting to use this illustration as a recipe would be dysfunctional. In field projects, schools found that it was impossible anyway, given the variety of contents, classrooms, neighborhoods, and innovations. Some teachers planned very gross change phases, others were detailed. Some planned in advance and adapted their plans later. Many also felt they did not know what the next step would be, exactly, until they arrived at it. Teachers were able to explore unknown curriculum ideologies and practices —gradually adjusting and adapting to better fit the curriculum to classroom needs within a framework generated and negotiated by the school's staff. ■

[1] R. Meighan and M. Roberts. "Autonomous Study and Educational Ideologies: A Review of Some Theoretical and Practical Issues with Special Reference to the Schools—Council General Studies Project" *Journal of Curriculum Studies* 11 (1979): 53-67.

[2] A fuller description of this particular transitional curriculum may be found in R. L. Butt, "Elementary School Science: A Progressive Plan for Classroom Change," *McGill Journal of Education* XIV (1979): 239-249.

[3] J. R. Suchman, *Inquiry Development Program* (Chicago: S.R.A., 1966).

[4] "Teacher's Guide for Sink and Float," in *Elementary Science Study* (Toronto: McGraw-Hill, 1968), pp. 11-13.

[5] "Teacher's Guide for Batteries and Bulbs," in *Elementary Science Study* (Toronto: McGraw-Hill, 1968), pp. 9-15.

[6] "Teacher's Guide for Mystery Powders," in *Elementary Science Study* (Toronto: McGraw-Hill, 1968).