

Payoff from Pausing

by Mary Budd Rowe

Dewey never said we learn by doing He said we learn by thinking.

Some years ago I discovered that teachers often go at such a pace in their questioning that no substantial thinking could take place. After ten years of research the following facts seem to hold true.

1 When teachers ask a question they wait one second or less for students to begin an answer It the reply does not start in one second the teacher repeats or rephrases the question or calls on someone else

2 After a student replies, teachers typically react or go on with more questioning in less than one second there is little chance for second thoughts by students

3 Teachers give the more able students more time to answer than they give the less able students

Questioning at this one second rate can make a shambles of an otherwise good science program.

It can inhibit language aid logic development as well as - productive inquiry by students.

The remedy we found is simple -- try to get average wait-times up to a minimum of **three seconds**. If you can do that, the following things happen

1

The length of relevant student responses or statements Increases markedly. Among advantaged groups, the increase in length of explanations is about 500 %. Among less advantaged groups, it's about 700 %.

2

The number of unsolicited but appropriate comment increases. The wait- time seems to provide students with a chance to hear each other They tend to add or offer counter opinions under the longer wait-time

3

failures to respond decrease. These failures are as high as 30 % in some classrooms Under the three-second wait-time, minimum fail- ures to respond drop to less than 5%. More students who typically avoid participation, take part.

4

More child-child comparisons of results, and arguments over alternative interpretations take place.

5

Evidence and inference get hooked together more often. Under the one- second regiment, students may respond with a three or four word phrase that either states an inference or a piece of evidence But rarely are the evidence and inference properly tied together.

6

Contributions by so-called slow learners increase.

7

The number of questions asked by children and the relevant experiments proposed by them increases. Children ask very few questions longer wait-times increase the probability of productive inquiry by students.

8

The number of disciplinary moves that teachers make actually decreases.

To help get control of wait-time, listen to a tape recording of your teaching. Find out whether you are hurrying the children's responses If so, stop, use wait-time.

Measurement, Motion and Change

p7 SCIS relative position and motion unit --

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