

A Note on Transfer and Generalization¹

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Cognitive education rests heavily on the assumption that concepts, rules, “cognitive functions,” and basic thinking processes can be transferred from the context in which they were acquired to a wide variety of other contexts and thereby generalized to new situations and contexts in everyday life. Thus, when children learn, for example, to *compare* geometric figures according to such dimensions as shape, size, color, and number, it is not sufficient that they become expert at comparing geometric figures. In fact, if that is all that happens, that aspect of cognitive education has failed. Rather, the goal is to help them to compare *spontaneously*, on the basis of similarity and difference, novel objects and events that were not part of the instruction. One wishes that they will develop habits of comparing, without being asked to do so, events in their everyday lives, such as persons, animals, foods, clothing, mathematical problems, plants, social interactions, nations, landscapes, television programs, books, and emotions.

Sometimes—indeed, quite often—such habits do develop in ways that seem spontaneous, independent of active teaching. Unfortunately, that does not always happen. A primary function of cognitive teachers is to promote just such development of thinking habits, especially transfer and generalization. Good mediational teachers employ two powerful techniques to promote transfer and generalization of basic cognitive processes (functions). These are *generalization activities* and *bridging*. Neither

technique is sufficient on its own, without the other.

Generalization activities are, as the name suggests, exercises that are similar to those in which the concepts, processes, functions, or rules were learned but with different content. Thus, if a basic lesson on classification (for example) was carried out by having the learners group people according to gender, or age, or height (thus demonstrating the flexibility of classes based on the criteria of classification), a generalizing activity might require grouping modes of transport according to speed, passenger capacity, and ease of access. Airplanes, for example, might go obviously into the “speedy” group and also into the “moderate-to-large capacity” group, but not into the “easy access” group (because one has to get to and from airports in order to use them). One such varied-content activity is usually not sufficient to assure broad generalization of classification principles, so excellent mediational teachers plan and use several such activities, until they are convinced that the learners have begun to classify object and events spontaneously—that is, the learners have developed a *habit* of comparing, grouping according to a similarity criterion, and naming the groups, that they have begun to demonstrate a *need* to do so, without having to be instructed to do it.

Success with generalizing activities demonstrates only that learners are capable of responding to external stimuli, of manipulating—both in space and in their minds, concrete objects and events. Cognitive

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education, by its very essence, is concerned with helping learners to manipulate *mental representations* of objects, events, ideas, concepts, rules, and possibilities. An important way of doing that is *bridging*. Introduced by Feuerstein as part of the mediational teaching style, bridging refers to the practice of *eliciting* from learners diverse examples of the application in everyday life (and to different contexts) the concepts, processes, and functions they have been learning. Example: The teacher has been emphasizing the importance of precision and accuracy in information gathering, in mental organization of information, and in communication. The then asks the learners, “When are some other times when it is very important to be sure you are taking in accurate and precise information?” If there is no response, the teacher might then “prime the pump” by suggesting a bridge: “How about when you see a speed limit sign while driving down the street through school zone? If the sign says 25 miles per hour, and, looking at it casually you read it as 35 miles per hour, what might happen?” If necessary, the teacher might suggest one or more additional examples, but always coming back to trying to *elicit* examples from the learners themselves.

“The great importance of bridging as a mediational teaching technique derives from the observation that any learned fact, concept, relationship, technique, or skill becomes more securely installed in the repertoire of the learner to that extent that it is examined, tested, applied, and tried out in a variety of contexts” (Haywood, 1988, p. 4). Following are some principles of bridging principles:

1. It is cognitive functions that are bridged, not just content or information.
2. Bridging examples should be elicited from the learners whenever possible.

3. Examples should be related to contexts that are familiar to the learners.
4. Teachers may need to “prime the pump” by offering examples to get the learners started in this cognitive habit.
5. Bridging examples should be simple and straightforward
6. Bridging should be done often, throughout the school day and in all classroom activities.