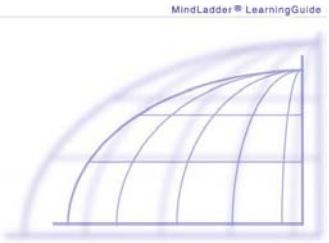

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T-17: Need for Logical Evidence

Observations of children who are developing knowledge construction functions point to the benefit of making a distinction between *having* and *using* strategies for inferential thinking. Of course the two overlap inasmuch as having strategies is a prerequisite for using them. Having them, however, does not ensure their use: Can does not ensure will. The shortfall is often seen when learners move from tasks that clearly call for logical scrutiny to tasks where such demands are less explicit. The shift reveals the necessity to develop the need for logical evidence as a knowledge construction function in its own right: In the absence of this function students may use the strategies they have only when specifically called upon to do so. There is no inner need to use them.

We have noted that strategies for inferential thinking (T-16) is a pre-requisite for the student to respond successfully to a need for logical evidence. However, as a knowledge construction function, the need for logical evidence is closely related to the development of the function of establishing relationships (T-14). Indeed, it builds upon it and extends the establishment of relationships into the specific area of sound reasoning.

Following the development of this knowledge construction function students spontaneously show a need to support their thinking and answers with logical evidence. They regularly question facts and inspect claims. When encountering an unexpected phenomenon (see also T-2) the need for logical evidence provides a powerful motivating force for these students to search their knowledge base and activate the range of their knowledge construction functions (see also T-3 and T-4).

Prior to the development of this knowledge construction function a student may simply reply "because" when asked why something

happened. If pressed she may say "because, because". The student has little need to seek logical evidence even for an unexpected or surprising experience.

To mediate this knowledge construction function have students enact two different versions of the same scenario. For example, the scenario can be receiving change at the supermarket checkout counter. In one scenario the need for logical evidence is deliberately switched off. In the other it is switched on. Follow each scenario and use the information to discuss how the need for logical evidence must reside within the learner. Under which scenario are we most likely to walk away with the correct change? Look for different examples where the lack of need for logical evidence can have important consequences. Here are some different scenarios you can use. It is easy to come up with many examples for both younger and older students.

Scenario: *Crying baby*. When the need for logical evidence is present we investigate the cause of the crying. What might happen if we did not investigate?

Scenario: *Smell of gas*. When the need for logical evidence is present we investigate the cause of smell of gas. What might happen if we did not investigate?

Scenario: *Soft brake pedal*. When the need for logical evidence is present we investigate the lack of resistance when we press the brake pedal. What might happen if we did not investigate?

Scenario: *Dying fish in the river*. When the need for logical evidence is present we investigate why fish are dying in the river. What might happen if we did not investigate?

Give examples of what can happen when facts or ideas are accepted without questioning them. For example, in medicine, what may happen if the doctor does not properly question the symptoms presented? Encourage students to come up with examples of their own. Analyze them. Encourage students to seek explanations. Stress the need for them to secure evidence in support of their conclusions. Ask them to justify their arguments so the need for logical validation becomes a habit. Show students how the need for logical substantiation works to protect them against specious thinking and bogus claims.