Learning How to Learn

Joseph D. Novak and D. Bob Gowin
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Learning How to Learn offers a different lens to view learning. The book represents learning from Ausubel's cognitive learning theory and from a phenomenological approach to philosophy. In sharp contrast with a behaviorist model that fosters only "rote" learning, the authors see learning as a change in the meaning of experience. For example, in learning photosynthesis, it is not merely memorizing the stages of the cycle and its terminology, but rather, it is the relating of the process of photosynthesis with previously known ideas to make meaning. So knowing photosynthesis changes, forever, how the learner perceives the interaction of sunlight, green plants, oxygen. The authors caution that learning is not an all or nothing proposition because learning is always being modified and being made more explicit. (Oh, I hadn't thought of that relationship or application before!)

Their conception of learning also pushes beyond a Piagetian Model. Novak and Gowin claim, "the weight of evidence is moving increasingly toward the view that after the ages of 30-36 months, all normal children possess essentially the same reasoning patterns as adults."

Learning How to Learn is contemporary with the discussion of metacognition which pervades the learning research in reading, writing, thinking skills and problem solving. The book aids the reader and, ultimately, their students in understanding their own learning process(es) and ways of knowledge construction.
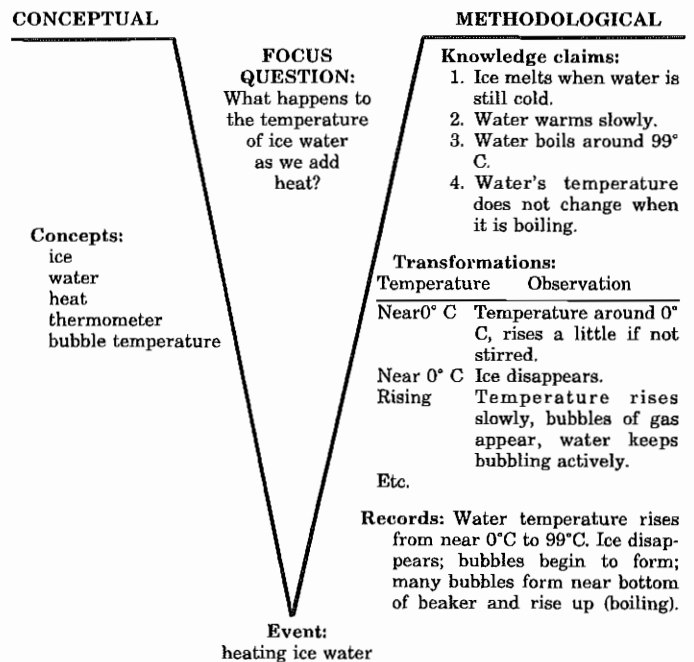
The book has grown out of 60 years of combined work at Cornell University by the authors and some 50 graduate students in developing better ways to teach science. In their research, two tools have been used extensively – Concept Mapping and the Knowledge Vee.

Concept Mapping calls for the student to represent his/her meanings in a diagram; for instance, what were the relationships of kings, the church and guilds in the era of feudalism? Mapping as a representation of meaning is based on the Ausubelian notion that cognitive structure is hierarchically organized, with more inclusive, more general concepts and propositions superordinate to less inclusive, more specific concepts. Returning to the claim that children have essentially the same reasoning patterns as adults, the differences are the number of concepts and proposi-

tions an individual possesses and their degree of hierarchical organization.

The authors elaborate on many uses for Concept Maps. At a student level, maps allow teachers to assess the meaning held by students on any planned topic of instruction. Maps are also useful during learning for students to share their expanding meanings and to dialogue with peers on similarities and differences in their perceptions. Maps can also be used as a means of assessing learning or learning change. A procedure to score maps is offered for those inclined to "objectify" learning. A full chapter is devoted to using concept maps as planning vehicles in designing units or full courses of instruction. Maps are recommended as a means to get meaning from textbooks, laboratories, studio and field experiences. A significant section of the book is allotted to practical suggestions for introducing concept mapping at three different instructional ranges – Grades 1-3, Grades 3-7, and Grades 7-College.

The second tool offered is the Knowledge Vee. The Vee's techniques are based on 15 years of Gowin's work. It was developed to help students and instructors clarify the nature and purpose of lab work in science. The figure below represents the Vee and the interrelationship between thinking and doing that a learner engages in while constructing a response to the focus question.

CONCEPTUAL — METHODOLOGICAL

FOCUS QUESTION: What happens to the temperature of ice water as we add heat?

Concepts:
ice
water
heat
thermometer
bubble temperature

Knowledge claims:
1. Ice melts when water is still cold.
2. Water warms slowly.
3. Water boils around 99° C.
4. Water's temperature does not change when it is boiling.

Transformations:

Temperature	Observation
Near 0° C	Temperature around 0° C, rises a little if not stirred.
Near 0° C Rising	Ice disappears. Temperature rises slowly, bubbles of gas appear, water keeps bubbling actively.
Etc.	

Records: Water temperature rises from near 0°C to 99°C. Ice disappears; bubbles begin to form; many bubbles form near bottom of beaker and rise up (boiling).

Event:
heating ice water

The Vee appears to be a very useful technique to call forth the application of principles and concepts in an interactive way with the process science skills of experimentation. It seems, too, that it offers a fine model to see the construction of knowledge. However,

for the reader seeking a "how to" on the use of Vees, the book fails to provide the clarity and direction that accompanied using concept maps.

The book is liberally laced with the authors' observations and opinions on the education process. They point out that an educational experience is a complex event in which attention must be directed to the learner, teacher, curriculum, and milieu (governance structure of education). These four points are frequently recalled as the authors attempt to create an awareness in the reader that improved learning goes beyond better techniques and materials for teachers.

As new strategies for evaluation are considered, the authors do a fine job in a brief space pointing out the limitations of current objective tests and their lack of correlation with subsequent achievement. The authors are also champions for students with learning problems. "We have found that many students classified as "learning disabled" are really bright children who lack the skill and/or motivation for rote mode learning, but who can move to the front of the class when they are given an opportunity for creative, meaningful representation of their knowledge."

The authors missed an opportunity for novel learning by not applying their suggestions for the reader's students more directly to the reader initially. A useful way to read the book, for instance, could call for the reader to map out his/her current views of evaluation before reading Chapter 5 (New Strategies for Evaluation: Concept Mapping). After reading the chapter the reader could then engage in integrative reconciliation (conflicting meanings of concepts are resolved). Further, the book would have more appeal to non-Science audience if the authors had related "their ideas" to common practices in other disciplinary areas. Concept mapping is becoming a household word in reading and language arts workshops. Cooperative learning has much compatibility with suggestions for students to dialogue about maps.

The authors have been remiss in understating the "integrated content knowledge" that a teacher needs to be successful with this approach to learning. The book calls for student skills that many teachers may not be skillful with. For example, students in constructing a hierarchical concept map, "must think through what one perceives to be the most inclusive, less inclusive, and least inclusive concepts in any body of subject matter." Given that many adults have not had opportunities to learn their disciplines in such a manner perhaps the book's main message should be aimed at public school curriculum committees text book designers, and inservice providers.

Learning How to Learn makes a significant contribution by offering a useful lens to view learning that is closely aligned with contemporary research in cognitive psychology and with a subjective and phenomenological approach to learning. The two tools presented (Concept Mapping and the Knowledge Vee) offer much promise; although the Vee needs further explication. The reviewers recommend the tenets of the book, but strongly content that the new learning paradigm will take several years of concerted effort for school districts to set in place.

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