

A MODEL OF EVALUATION PROCESSES IN EDUCATION: BASED ON JOHNSON'S EVALUATION SCHEMA

Paul Zachos, 2004

Evaluation is essentially a comparison of expectations with results. In education our expectations are primarily learning goals (intended learning outcomes). The purpose of teaching is to achieve learning goals. Learning goals run the gamut from the very broad (the ability *to read*) to the very specific (the ability *to distinguish the letter "t"*).

The process of evaluation can be presented schematically in Figure 1. Let's use a schematic developed by Mauritz Johnson to consider the different facets and processes of evaluation related to a science education program.

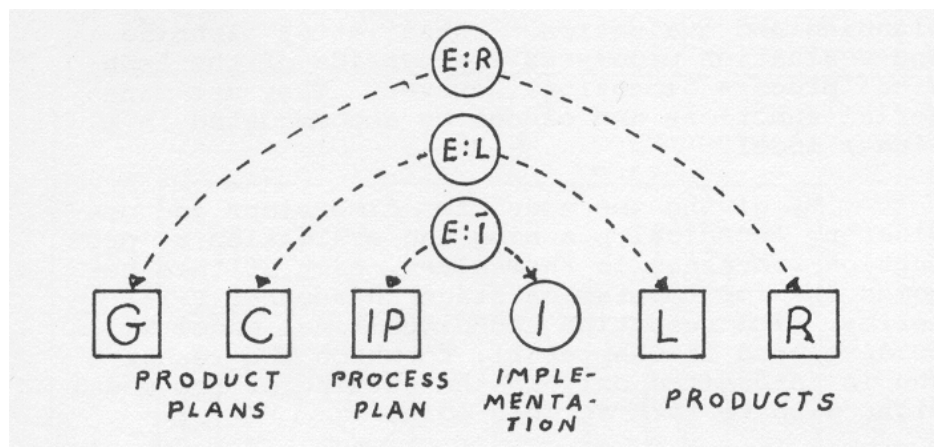


Figure 1. Evaluation Schema (from Johnson, 1977)

Let **G** represent a broad goal such as *the ability to conduct a scientific inquiry*. (Let's put aside for now the fact that the conduct of a scientific inquiry would take very different form for an elementary vs. a secondary program, or for a basic vs. an elective course.)

Let **C** represent a set of specific learning goals (say components of the broader ability to conduct a scientific inquiry). Here, I am imagining capabilities that could be developed in a lesson or set of lessons that make up a unit of instruction, for example, *the ability to distinguish observation from inference*. A **curriculum** can be thought of as a structured set of such intended learning outcomes.

Let **IP** represent a plan for instruction targeted to this and other learning goals at a similar level.

Let **I** represent the process of instruction itself, the actual teaching that is carried out (note: Processes are enclosed by circles as opposed to squares).

Let **L** represent evidence indicating whether the specific learning goals (again, *the ability to distinguish observation from inference*) has been achieved. We cannot directly observe whether learning has occurred. Rather, we must observe student performance and use it as evidence to make inferences about the attainment of learning.

Let **R** represent evidence concerning whether the broad goal of being able to conduct scientific inquiry was achieved.

Now, let's consider the many facets and processes of evaluation in educational programs.

By comparing **R** with **G** we can see whether the broad goal was attained. Such an evaluation is intended to answer the question: *Can students conduct scientific inquiry?* This evaluation process is represented in the diagram by **E:R**.

By comparing **L** with **C** we can see whether the specific intended learning outcomes were attained. Such an evaluation is intended to answer the question: *To what extent did each of the students attain the targeted scientific inquiry capabilities?* This evaluation process is represented in the diagram by **E:L**.

By comparing **I** with **IP** we can evaluate whether instruction was faithful to the instructional plan. Such an evaluation would be intended to answer the question: *To what extent was instruction carried out as specified?* The evaluation process is represented in the diagram by **E:I**.

With the availability of assessments that provide information keyed to the individual learning goals the questions associated with **E:R** and **E:L** can be readily and unequivocally answered.

To answer the question of fidelity of instruction to the instructional plan **E:I**, we need a report from the teacher or a structured observation of instruction, or, ideally, both.

Once we know that instruction has been faithful to the instructional plan, there are more subtle questions that can be approached, such as the relationship between instruction and learning - *Can the learning which occurred be attributed to the instructional method?* (Did **I** lead to **L**): Addressing this type of question requires rigorous research design to control for alternate plausible hypotheses for results including selection bias.

Johnson, M. (1977). *Intentionality in Education*. Albany, NY: Center for Curriculum Research and Services, State University of New York at Albany.