



Four Key Dimensions of Performance

The EFF development team has identified four key dimensions of performance that are being used to construct a developmental performance continuum for each EFF standard. These dimensions are:

1. Structure of knowledge base.
2. Fluency of performance.
3. Independence of performance.
4. Range of conditions for performance.

1. Structure of Knowledge Base.

What is a knowledge base and how do we build it? Traditionally we think about a knowledge base as what you know. The literature on expertise and transfer asks us to think not only about what and how much you know (the number of facts, procedures, concepts, etc.) but also how your knowledge is organized. The goal is to assure that, as an individual's knowledge relative to a particular domain or skill grows, the structure of the knowledge base also develops, becoming increasingly coherent, principled, useful, and goal oriented.¹ This means that what a person knows—at whatever level of knowledge—is organized for efficient retrieval and application in every day life. S/he has access to that knowledge, and can draw upon it for effective action in the world.

We see evidence of such developments in the knowledge base in improved performance along the other three dimensions we have identified. That is, a knowledge base organized around meaningful concepts, including an understanding of when and under what conditions information or strategies are useful, supports performance with greater fluency and greater independence under a greater range of conditions.

2. Fluency of Performance.

This dimension reflects the old axiom “practice makes perfect.” EFF defines it as the level of effort required for an individual to retrieve and apply relevant knowledge. Points along the continuum range from “slow performance, with a great deal of effort,” through “some effort” and “fluent,” to “fast, effortless, ‘automatic’ performance.”³

According to *How People Learn*

1. Experts, regardless of field, draw on a richly structured instruction base.
2. Experts recognize meaningful patterns of information. Experts' command of concepts allows them to see patterns, relationships, or discrepancies that are not apparent to novices.
3. Experts organize their own knowledge in meaningful patterns around core concepts, big ideas or basic principles of the area of expertise.
4. Experts' knowledge is “conditionalized”—it includes a specification of the contexts in which it is useful. Conditionalizing knowledge transforms it from “inert” to “active,” useable knowledge.
5. Experts can retrieve relevant knowledge (without effort) as a result of 1-4 above. That is:
 - a. They can recognize meaningful patterns in a problem they need to solve.
 - b. They can identify the relevant concepts or big ideas for solving that problem.
 - c. They can identify the relevant conditions of usefulness of those concepts.
 - d. As a result, they can fluently retrieve the information that is necessary to solve a problem.²

3. Independence of Performance.

An important indicator of an adult's increasing skill is the extent to which s/he needs direction or guidance in using that skill. EFF uses DeFabio's definition of independence for this dimension: "an individual's ability to select, plan, execute, and monitor his or her own performance without reliance on the direction of others."⁴ Points along a skill development continuum for this dimension of performance would look at a decreasing need for assistance in carrying out these metacognitive functions, whether a person is acting alone or in collaboration with others.

4. Range of Conditions for Performance.

This dimension goes to the heart of how well an individual can use a skill. Included in the EFF concept of "range" are variables related to both task and context. These variables include the kind as well as the number of tasks and contexts in which one uses the skill. Variables to consider include the degree of familiarity or unfamiliarity of a task or context; the extent to which the task is structured or unstructured; and the complexity of the task.

The team has chosen to focus the continuum on these four dimensions of performance because they describe not only what people know but also how well they can use what they know. Together, they will provide a simple, coherent, research-based picture of performance that makes sense within programs and to the many other stakeholders who care about what people can and cannot do as a result of their learning. They will enable users both to capture the complexity of what students are capable of performing and to communicate it in a way that is easy to understand.

"I found the Dimensions of Performance very useful in helping me define where students were when they came into the class and how their learning developed over the short period they spend with us (6-10 weeks). I needed something that was intelligible and "says something" to me, to the students and to the employers who come to us looking for entry-level employees.

The Dimensions of Performance:

- **Structure of Knowledge Base** – What does a learner know and how it is organized?
- **Degree of Fluency** – Is a learner performing the task with difficulty or is it automatic?
- **Performing with Increasing Independence** – How much guidance does the learner need? Are they acting alone or are they working in teams?
- **Range of Performance** – How many different skills does the learner exhibit and what sort are they?

The Dimensions of Performance have given me a flexible template to build customized assessment tools that really provide a picture of learner progress. I'm still building the tools and hope to have a final product that is a combination of qualitative and quantitative data as well as student and instructor narrative."⁵

—Anson Green

¹ *How People Learn*. This report of the Committee on Developments in the Science of Learning, Commission on Behavioral and Social Sciences and Education, National Research Council, provides an excellent summary of this body of research, and related research on transfer of learning. The report suggests that teachers can facilitate building a coherent, active, usable knowledge base by:

- providing students with opportunities to recognize meaningful patterns of information;
- organizing curricula around big ideas or core concepts, and staying with a domain long enough for students to develop deeper understanding of facts, formulas, etc.
- teaching applications across a number of contexts.

² *Ibid.*, 36-37.

³ Robert Glaser, "Expertise and Assessment," in *Testing and Cognition*, 26.

⁴ Cognitive scientists understand increasing automaticity as the process of knowledge about the skill (facts, procedures, strategies, and concepts) moving from active working memory to long-term memory. See Jennifer Cromley, "Learning to Think Learning to Learn: What the Science of Thinking and Learning Has to Offer Adult Education" (Washington, DC: National Institute for Literacy, 1999).

⁵ Anson Green, Northwest Vista College, San Antonio, TX. Documentation of EFF field research, August 1999.