



Instructional Design Memo

Transfer of Learning

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"Education is what remains when we have forgotten all that we have been taught."

–George Savile

Transfer of learning defined

Transfer is the ability to take what one has learned in one context and use it in a new instance (see Salomon and Perkins, 1988). Transfer of learning experts Perkins and Salomon (1992) describe the mechanism of transfer as follows:

Transfer of learning occurs when learning in one context or with one set of materials impacts on performance in another context or with other related materials. For example, learning to drive a car helps a person later to learn more quickly to drive a truck, learning mathematics prepares students to study physics, learning to get along with one's siblings may prepare one for getting along better with others, and experience playing chess might even make one a better strategic thinker in politics or business. (p. 1)

Put simply: Transfer, or application of learning, is the core purpose of education.

Types of transfer

Talk of transfer of learning infers that some jump between contexts has been made, wherein what is learned in one setting is applied to another situation, leading to expanded and/or new understanding. The size of this leap dictates whether one of two types of transfer is involved: **near** transfer or **far** transfer.

According to Perkins and Salomon (1992), "near transfer refers to transfer between very similar contexts" (p. 3). For example, a

has never seen before, but which has the same anatomy, size, shape, and color as other flowers she has used in the past, is engaging in near transfer. Another example of near transfer would include a student who is answering isomorphic questions on an exam that are structured just like questions she worked on in class or on homework.

Far transfer, on the other hand, “refers to transfer between contexts that, on appearance seem remote and alien to one another” (Perkins & Salomon, 1992, p. 3). In far transfer, tasks may look completely different but are actually “conceptually similar (follow the same rules)” (Svinicki n.d.). An example of far transfer might be a student who has practiced doing simple plug and chug Pythagorean theorem problems, solving for c in the following equation $a^2 + b^2 = c^2$, where $a=3$ and $b=4$ (context 1), and recognizing that she can use that same theorem to calculate the shortest distance between two points (context 2).

Mechanisms for transfer

Perkins and Salomon (1992) further categorize transfer by referring to two different transfer mechanisms, or “psychological paths by which transfer occurs” (p. 6–7): **low road** and **high road** transfer. Transfer along the low road occurs when skills are well practiced and the learner encounters a context with apparent perceptual similarities to the original domain of learning. In this case, transfer is more likely to occur since common surface features essentially cue the *employment* of automatized processes. For example, encountering printed text automatically cues the reader to read what is there. Svinicki (n.d.) suggests that low road transfer might involve “tasks that are perceptually similar,” such as “driving a Ford and driving a Chevy.” When low road transfer is involved, behavior is often automatic—you know what to do without having to think about it much.

When the new learning context differs considerably from the original, transfer happens along the high road. The learner must call upon a higher metacognitive application of what he or she knows or knows how to do. In these cases, similarities lie far beneath the surface, requiring deliberation and reflection to identify the principles or analogical relationships that tie together the seemingly dissimilar frameworks. In high road transfer, the learner must ask questions where the answers are not automatic or obvious: “What is the general pattern in this problem, what do I need to solve it? What principles might apply here?” (Perkins & Salmon, 1992).

Why teach for transfer?

Imagine the jaded youth at the back of the classroom asking: “What’s the point of all this?” Perhaps the student intends to be antagonistic, but the question is a legitimate one. What the student is really asking is, how will this information prove useful to me when I leave this classroom? Perhaps the teacher has wondered

the same. Ultimately, education should produce better learners, a better workforce, and better citizens. To do this, we need to equip students to use what they have learned to navigate future situations that they have never seen before, not to simply recite what's already there.

How to teach for transfer

The student who dares question the purpose of a lesson calls attention to an often held but usually misguided assumption in education that Perkins and Salomon refer to as the “Bo Peep theory of transfer” (Perkins and Salomon, 1988). Like Bo Peep, the assumption holds that students will find their way without any intentional guidance about how to get there; they will take what they learn and apply it automatically to the appropriate situations without any help from peers or teachers. In fact, what most often results from teaching without an eye toward transfer is what Whitaker (1929) termed “inert ideas”, or situated knowledge and skills that remain largely compartmentalized and useful for little more than performance within the limited context where the learning occurred. So how can we teach for transfer as educators?

1. Focus on big ideas

Standard educational practice, with its emphasis on *steady progression through topics* and high-stakes testing, often fails to foster even near transfer, let alone far transfer (Wiggins and McTighe, 2005). When quantity is emphasized over quality, students generally fail to develop the automaticity of skill and knowledge necessary to enact low road mechanisms. A better approach entails in-depth focus on a few “big ideas” (p. 65). When possible, help students build mastery of the most important, foundational concepts of the subject, the concepts and principles that lie at the crux of a given domain and provide a frame of reference from which to handle other problems and situations within that domain. An example of a big idea in English is irony or in Physics, gravity.

2. Use hugging

Transfer of learning does not often happen without instructional intervention. Typically, transfer can only be expected with an intentional effort to foster it. Along with in-depth focus on a few big ideas, teachers can employ hugging to engage low road transfer mechanisms. This practice involves making explicit connections between the two similar, or near, contexts of desired transfer. For example, an instructor who asks students to solve physics problems using baseball examples and then has the students solve similar problems using softball problems is hugging. When using this strategy, always point out to students the similarities between the contexts, concepts, or situations being “hugged.”

3. Use bridging

Another practice called bridging can be used to facilitate the more difficult to come by mechanisms of high road transfer. Overwhelming evidence suggests that knowledge specific to a context, so-called local knowledge, no matter how in-depth, remains local without intervention; little infiltration occurs between the original learning and new situations that are encountered. Recognizing connections between contexts that are related only on an abstract level rarely occurs unless a teacher creates explicit bridges between the shared features of familiar and new domains of learning. The teacher-student relationship between Mr. Miyagi and Daniel in the movie *Karate Kid* provides an excellent example of bridging. Mr. Miyagi assigns chores to Daniel not to hone his skills at car waxing and fence painting, but to transfer these abilities to karate so that he could block vertically (painting) and horizontally (car waxing). Later, Miyagi calls Daniel's attention to the skills encompassed by the two so seemingly disparate domains of learning and, in so doing, achieves successful far transfer.

4. Use contrasting cases

Another way to facilitate near and far transfer is to use contrasting cases (Schwartz et al., 2011). Figure 1 distinguishes a contrasting case from a single case for dog breeds. Contrasting cases can help facilitate transfer by helping students develop deep understanding of both the general and the specific characteristics of a case. For example, if a student who doesn't know what a dog is only studies the single case in the Figure 1, she will have a much smaller grasp of "dog" than if she studies a set of contrasting cases. This nuanced understanding can help her recognize and apply her knowledge to new cases she has never seen before.

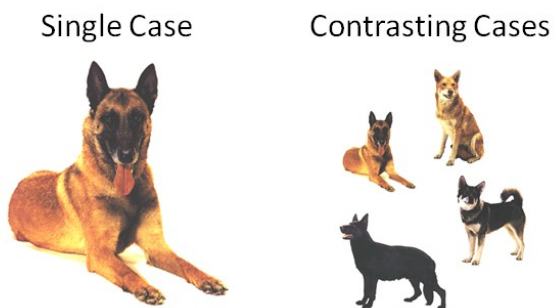


Fig 1. From <http://aaalab.stanford.edu/research/inventive-learning/contrasting-cases/>

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