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# Teaching economic principles with analogies

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ABSTRACT

According to the generative theory of learning, people understand new concepts by idiosyncratically relating them to prior experiences and prior stored information. This paper describes a practical strategy for using the generative learning teaching technique of analogies to help instructors assess whether students are correctly integrating new learning within the context of their prior experience. Insights from a piloting of the technique are discussed, including student perceptions.



> "A traditional way to check students' understanding has been to give a test every few weeks and use the grades as indicators of their comprehension. This system does little to determine if a students' preexisting understanding has interfered with his or her learning. A preferable approach is to ask students to regularly tell us what they have learned in their own words, using examples and analogies that demonstrate their accurate understanding of the new material." Terry Doyle in Helping students learn in a learner-centered environment (Doyle, 2008, p. 143).

## 1. Introduction

It is not sufficient for instructors to solely have knowledge of the material they are teaching. To be most effective, they must also have knowledge of their learners. Learners bring with them an accumulation of years of experiences, stored knowledge, preconceptions and sometimes misconceptions. There are many types of errors that students make when learning new material. Some, for example, are computational while others may stem from not understanding the definition of a term. Instructors likely have adopted teaching strategies to help students with those kinds of mistakes. But there is another common type of student error that instructors should be aware of and have teaching strategies for—errors stemming from "incorrect mindsets".

The Theory of Generative learning (Wittrock, 1974) posits the learner relates new information to information she already understands by creating her own connections between the new concepts and prior stored information. The new content that she is exposed to may integrate seamlessly into her schema, may be partially or incorrectly processed, or may be rejected entirely if it conflicts with what the learner already "knows" to be true.

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According to The Generative Model of Mislearning and Recovery (Kourilsky, 1993, p. 25), in the economics discipline prior experiences and knowledge "can divert the student toward representations and processes that are inconsistent or in direct conflict with correct understanding". For example, in lecture instructors can make a point of explaining scarcity does not mean rarity, a decrease in supply is a reduction in quantity at all prices, and the difference between positive and normative analysis. Despite our best efforts, some students continue to equate scarcity with rarity because in their mind that is what scarce *really* means. Students have a tendency to illustrate a decrease in supply by shifting it to the right because it then looks "lower" on the graph. Students often hold on to preconceived opinions even in the face of a sound economic argument to the counter.

Examples of incorrect mindsets fall into three categories: the linguistic mindset, the physical mindset, and the resistive mindset. The linguistic mindset is the tendency to identify with the everyday language usage of a word (e.g., scarcity vs rarity). Conflicts can occur either when the economic usage differs from the everyday usage or if the precision of the term matters (e.g., quantity demanded vs demand). The physical mindset derives from the students' physical experiences that cause misconceptions with regard to the understanding of graphical representations (e.g., shifting supply right to illustrate a decrease). The resistive mindset derives from the natural resistance to acknowledge a reality that is different from what the student believes "ought to be" the case (e.g., price ceilings are not necessarily beneficial for consumers). These incorrect mindsets can impede students' understanding of economic concepts. Table 1 presents some examples of economic concepts that may fall into each of the three incorrect mindsets. We compiled this listing by examining our own classroom experience (24 years combined) and speaking with colleagues.

Traditional methods of evaluating students' knowledge allow instructors to measure learning to some extent, but do not provide insight into understanding the *ways*students think about the concept (Weimer, 2002). Sharp et al. (2005) give an overview of generative learning strategies, as applied in an economics course. Strategies that assist students in making connections to their prior experience and knowledge are known as *integration*strategies. Strategies that assist students in making connections to the extended information are known as *elaboration*strategies. One example of an integration strategy is to develop analogies or metaphors for the concept, while elaboration strategies include identifying real world examples that relate to new concepts and synthesizing discipline specific content with content from other disciplines.

**Table 1**
Incorrect mindsets and economic concepts.

| Concept or term | Difficulty for students |
|---|---|
| Linguistic mindset | |
| Scarcity vs rarity | Economic usage of "scarcity" differs from everyday usage |
| Quantity supplied vs supply | Precision of the term matters |
| Quantity demanded vs demand | Precision of the term matters |
| Inelastic elasticity | Seems contradictory |
| Zero economic profit vs earning no money | Economic usage of "zero" differs from everyday usage |
| Demand for labor vs wanting to have a job | Economic usage of "demand" differs from everyday usage |
| The "cost" in opportunity cost isn't just money | Economic usage of "cost" differs from everyday usage |
| Shift vs movement along | Precision of the term matters |
| Unintended consequences vs externalities | Both terms are conceptually new to most principles students and the definition of externalities is often confused with unintended consequences |
| Above vs increasing (e.g., on an average-marginal graph) | Precision of the term matters |
| Macroeconomic definition of investment | Economic usage of "investment" differs from everyday usage |
| Deficits vs debts | Precision of the term matters |
| Physical mindset | |
| Spending money has a cost but spending time does not | Spending money has a physical, concrete nature to it while spending time is abstract |
| Upward shift in a supply curve is a decrease in supply | The resulting curve looks "higher" and in the physical world higher is often associated with an increase |
| A price ceiling below equilibrium is binding but above is not | In the physical world ceilings are above other things in the room, putting a ceiling below something else feels counterintuitive |
| A price floor above equilibrium is binding but below is not | In the physical world floors are below other things in the room, putting a floor above something else feels counterintuitive |
| Resistive mindset | |
| Price controls are not always good for consumers | The minimum wage, rent control, and price ceilings on consumer goods all sound like beneficial things |
| A monopoly is not necessarily always a bad thing | Students seem predisposed to thinking that there is never a defensible reason for the existence of a monopoly |
| Sales tax on producers or consumers leads to the same results | Students seem predisposed to thinking that taxes on producers or firms are better than and unrelated to any impact on consumers |
| Regulation doesn't necessarily fix the problem | Students seem predisposed to thinking that rules and regulations are easy fixes to issues, without regard to how market forces come into play |
| Ceteris paribus | Students seem resistant to the idea that there is usefulness to holding several factors constant in order to examine one of them |