Lesson sequencing: Should concrete experiences occur before or after abstract conceptualization?

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Imagine that I want to teach young children about farm animals. Do I take my class on a field trip to a farm, and then have them recall that experience later when I teach them about cows and horses? Or do I teach my class about farm animals, and then at the end of the unit, take them on a field trip to a farm? (F. Cherian, personal communication, October 17, 2022).

Constructivists, like John Dewey, suggest that learning should occur through concrete experiences (Dewey, 1916), such as field trips and hands-on activities in the classroom. When developing my teaching philosophy, I was inspired by these ideas, and hoped to integrate them into my teaching practice. During my practicum, I developed an activity that would help students understand the formula for the area of a triangle, after already learning the area of a rectangle. The task was simple: To cut a rectangle, diagonally, so that two triangles were formed. The area of the rectangle was divided in two, which is why the formula for the area of a triangle is base times height *divided by two*. I grappled with the lesson sequencing; struggling to determine whether the paper cutting activity should happen before or after teaching the formulas. The goal of this inquiry paper is to determine if concrete experiences should occur before or after abstract conceptualization. My answer will be a combination of theoretical arguments, personal experiences, and opinions.

Consideration of the Problem: Direction and Efficiency, or Exploration and Creativity?

Teacher-led instruction before concrete experiences can help to shape student expectations and provide them with a sense of direction (Gibson & McCormick, 2019). For example, if students know that they are learning about similes before you read them a book with similes in it, their ears are already primed to hear the figurative language. Having predictable,

routine, instruction before activities can also reduce student stress and increase efficiency in learning (Sanchez, 2020). Conversely, if the concrete experience is given before the abstract concepts are taught, students can take a more exploratory and creative approach to learning (Wideman, 2019). Without any expectations of what students are "supposed to" learn, there is an opportunity for learning in unexpected ways. Although it can be more efficient to provide the learning expectations at the start of the lesson, doing so can cause confirmation bias because students will be looking for and focusing on information that supports those learning expectations (Darling-Hammond, 2020). Students become more narrowly focused and less open to new ideas.

Possible Strategies: Before or After?

There are two possible strategies incorporated right into the wording of the question: Concrete experiences can either happen *before* or *after* the abstract conceptualization. I recognize that there are also lesson sequencing models that fall in between these opposing strategies. For example, workshop models include a mini-lesson, followed by hands-on activities, and then a follow-up discussion (France, 2020). However, to some degree, either abstract instruction or concrete experience must come first, and so I will focus my analysis on these two opposing strategies.

Theory Supporting an Abstract-to-Concrete Method

Lev Vygotsky developed the idea of the *Zone of Proximal Development* (Long et al., 2011), which was then expanded upon by Wood et al. (1976) using the metaphor of *scaffolding*. The idea of scaffolding is that, initially, the teacher supports the student through the construction of their understanding. Then, the teacher gradually removes this support to foster student independence (Long et al., 2011). A similar idea is the *Gradual Release of Responsibility* model

(Pearson & Gallagher, 1983). The idea of this model is that lessons start with the teacher leading

instruction, and then the teacher gradually releases the responsibility onto the students and has

them work more independently (Pearson & Gallagher, 1983). Essentially the lesson progresses

from completely teacher-led to completely student-led learning. Even *Bloom's Taxonomy*

implies that lessons progress from abstract understanding to concrete experiences, with

"creating" at the upper level of the taxonomy and "remembering" at the bottom (Armstrong,

2010). Another model that more explicitly supports abstract ideas before concrete experiences in

school is *Gagne's 9 Events of Instruction* (Miner et al., 2015). Gagne's model provides

systematic steps for how classroom instruction should progress to achieve optimal learning

(Miner et al., 2015). The steps are as follows: 1) Gain student attention, 2) Inform the students of

the objectives, 3) Recall prior learning, 4) Present content, 5) Provide guidance, 6) Practice, 7)

Provide feedback, 8) Assess student performance, 9) Enhance retention and transfer (CourseArc,

2015). Note that presenting the lesson content is step number four and practicing is step number

six, clearly indicating that practice should follow information delivery.

Theory Supporting a Concrete-to-Abstract Method

One of the main theories that supports having the concrete experience first is *Kolb's*

Experiential Learning Cycle (McLeod, 2017). This cycle has 4 stages: Concrete experience,

reflective observation, abstract conceptualization, and active experimentation (McLeod, 2017).

Reflecting upon the experience is an important step in learning and understanding the concepts

(McLeod, 2017).

Brain development also suggests that our thinking should move from the concrete to the

abstract. Abstract thinking is not fully developed until around age twelve (Healthline, 2018). In

Piaget's *Stage Theory*, he discusses the *formal operational stage* as the development of abstract

thinking, around 12 years and older (Long et al., 2011). Thus, especially for younger kids, lessons should start with concrete experiences.

In today's schools with students of mixed socio-economic and cultural backgrounds, having a common experience to anchor learning could be beneficial (National Association of Elementary School Principals, 2020). Martín-Alonso and colleagues (2021) agree that students interpret the curriculum content through their own experiences and personal life stories. So, if students participated in a shared experience before the lesson, then the teacher could continuously refer to this learning experience and be confident that everyone has it in common.

My Ideal Approach: Concrete-to-Abstract

Based on my experiences, teachers usually explain the abstract concepts before they give students time to explore and practice. In my practicum, my lessons always followed some version of *Gagne's Nine Events of Instruction* (Miner et al., 2015). The students had become very accustomed to the routine of sitting down to listen to me lecture at the start of the class, and it made the lessons very efficient. Yet, I felt as if the students were robots that worked automatically and routinely. It was as if the students were sponges, simply absorbing the information that I gave them. From my experience, abstract-to-concrete is more efficient for learning, but concrete-to-abstract is more engaging and memorable. It is a lot more exciting to walk into class and begin activities or experiments, and then learn the theory afterwards. I remember when I went to *Mad Science* camp when I was younger, we would build helicopter toys, slime, and other fun things, and then talk about the science theory at the end. In elementary school I went to the *Windsor Symphony Orchestra,* and we were told to simply watch and enjoy. Later, back in class, we reflected upon and learned from our experiences.

So, even though an abstract-to-concrete method of teaching seems to be more common, I would like to implement a concrete-to-abstract method in my teaching. As humans, we develop our thinking from concrete to abstract experiences based on Piaget's *Stage Theory* (Long et al., 2011). As a teacher, I could be confident that students have a shared experience to refer to, regardless of socio-economic status or cultural background (National Association of Elementary School Principals, 2020). I would use *Kolb's Experiential Learning Cycle* (McLeod, 2017) to guide my practice. The lesson would start with a concrete experience, then there would be reflective observation, abstract conceptualization, and active experimentation (McLeod, 2017).

Monitoring Which Method Works Best

Overall, I think it is better to start with concrete experiences before introducing abstract concepts. However, I think the ideal strategy would depend on the context and content of the lesson, and the best approach would be unique to each student. Martín-Alonso et al. (2021) recognise that every teacher, student, and situation is unique, so the way the curricular program is taught, as an expression of the lived curriculum, will vary. To determine which method my class responds to best, I could use both methods and then ask my students which method they prefer. Reeve and Shin (2020) promote agentic engagement in the classroom whereby students can express their preferences and offer input. To quantitatively assess the effectiveness of each strategy, I could look at the trend in grades. Or, since students can assess themselves through self-reports with reasonable accuracy and reliability (Darrow et al., 2002), again, I could ask the student how they learn best (Reeve & Shin, 2020). I will teach using whichever method my students find most helpful, whether that be concrete-to-abstract or abstract-to-concrete.

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