LEARNING HABITS

SAM REDDING AND JANET TWYMAN

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Center on
Innovations
in Learning

OVERVIEW

The teacher personalizes learning to ensure mastery of knowledge and skills by...

Developing students' personal competencies

Facilitating student-directed personalization of learning

Creating portraits and possibilities

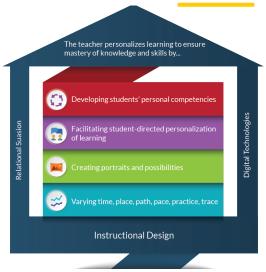Varying time, place, path, pace, practice, trace

Relational Suasion

Digital Technologies

Instructional Design

The Center on Innovations in Learning (CIL)'s model for personalizing learning, as exemplified in the "house" graphic, approaches personalization from the perspective of the teacher—how the teacher personalizes learning for students and enables students to personalize learning for themselves. Learning habits receive particular emphasis in the CIL model as the behavioral expression of the four personal competencies in the statement: "The teacher personalizes learning to ensure mastery of knowledge and skills by developing students' personal competencies." The teacher builds the student's personal competencies so that the student's learning habits are strong, which is especially important in a learning environment that grants students extraordinary autonomy in choosing their routes to mastery and, in some cases, their destinations.

In CIL's conception of personalized learning, personal competencies (cognitive, metacognitive, motivational, and social/emotional) converge in forming the student's learning habits, the patterns of behavior the student exhibits in pursuit of a learning goal (Redding, 2013; 2014a; 2014b). The learning goal may be the desired outcome of a task assigned by a teacher or one presented in a digital lesson; it may also be chosen by the student to satisfy curiosity or acquire new capabilities.

Each student draws from a well of personal competencies in deciding what to learn, how much effort to invest, what methods to employ, and why it matters. The deeper and broader the well, the more robust and varied the learning habits. The teacher's job is to help the student dig the well.

SUPPORTING RESEARCH

Personal competencies converge to form a student's learning habits, or the patterns of behavior the student exhibits in pursuit of a learning goal. Layng (2016) describes learning habits as the convergence of competencies in patterns of behavior aimed at learning, similar to the CIL explanation, but he adds a further level of detail. In Layng's explanation, the four competencies are "essential repertoires" filled with more finite skills and understandings that are *recombined* in any learning event.

> . . . the essential repertoires described as cognitive competencies, metacognitive competencies, social and emotional competencies, and motivational competencies consist of critical building block competencies that converge in such a way that a clear demarcation between each may not be possible. What separates them are the conditions under which often-well-defined competencies occur and are taught. As metacognitive competencies are acquired, they can be harnessed to teach SEL and motivational competencies. Accordingly, the critical repertoires in all of these competencies can be directly taught and hence measured using criteria established for teaching complex cognitive skills (after Tiemann & Markle, 1991) and can produce actions that result in meaningful differences for all learners. (p. 32)
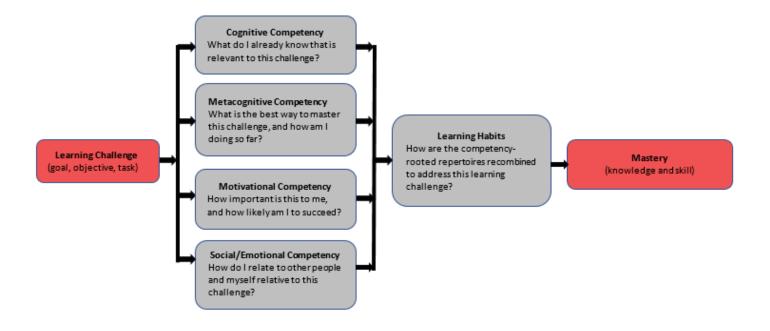
Thinking of the four personal competencies as constellations of related repertoires provides a convenient way to categorize, understand, and make order from a multitudinous batch of ever-changing skills and understandings available to the learner. Furthermore, the idea of learning habits gives further conceptual unity and clarity to a complex of variables that come into play in the process of learning.

Layng makes two points that are highly significant to our understanding of learning habits and personal competencies: One is that the four competencies converge in what we are calling learning habits, and the other is that the "critical repertoires in all of these competencies can be directly taught and hence measured" (p. 32). The competencies, then, can be deconstructed to define the learner repertoires (skills and understandings accessible to the learner) they contain. Layng details the behavioral components of each of the four personal competencies, and in doing so, he contributes a specificity and concreteness to their meaning that facilitates measurement, even as he portrays learning habits as a thick soup of repertoires drawn from any of the competency domains to fit the situation.

Twyman (2016) gives us reason to measure the elements of the learning process when we strive to personalize, writing that ". . . measurement is essential to any earnest teaching (or learning) effort. Without it we cannot truly or well personalize instruction for any student, let alone for all students. When done well and for the right reasons, measurement is one of the most caring and beneficial acts teachers can do" (p. 149). Measurement is also, Twyman goes on to note, feedback to the student that is especially critical when the student exercises choice and makes decisions about what is learned and the paths by which the learning is acquired.

Figure 1: Elements of the learning process

Cognitive Competency
What do I already know that is relevant to this challenge?

Metacognitive Competency
What is the best way to master this challenge, and how am I doing so far?

Learning Challenge
(goal, objective, task)

Motivational Competency
How important is this to me, and how likely am I to succeed?

Learning Habits
How are the competency-rooted repertoires recombined to address this learning challenge?

Mastery
(knowledge and skill)

Social/Emotional Competency
How do I relate to other people and myself relative to this challenge?

LEARNING HABITS IN PERSONALIZATION

Figure 1 illustrates the relationships among the elements of learning that are germane to our discussion. Although the learner would be primarily concerned with advancement toward mastery, with milestones and metrics to gauge progress along the way, the instructor would also be interested in the learning habits on display, which means peeking inside at the competencies and their constituent repertoires.
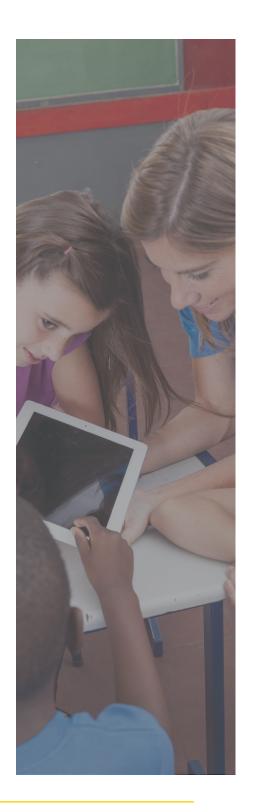
Learning Habits in Personalization

The learning challenge (goal, objective, task) is to achieve mastery of specified knowledge and skill under given conditions. To gauge the learner's capacity to achieve mastery, the strength of the learning habits is key, and the learning habits' strength is derived from the depth and vitality of the personal competencies and their repertoires. Fluency comes from the relative ease and quickness—the automaticity—upon which learning habits are exercised. Layng suggests that the repertoire is the appropriate unit for measurement. He also points out that the repertoires within each competency vary by type and degree (or level of sophistication), allowing for more specific measurement. See, for example, Bloom's taxonomy (Bloom & Krathwohl, 1956) as levels of sophistication of cognitive knowledge. Twyman (2016) also stresses the importance of measurement in the concept of "trace," asking, "How do we know when a student has learned something or, perhaps more importantly, if a student is learning?" (p. 149). The "if a student is learning" question is particularly relevant to our discussion of learning habits. Twyman further advocates for close tracking of students' learning processes and outcomes: ". . . precision measurement [is] the real-time, in situ collection of relevant evidence regarding the current state and progression of a student's
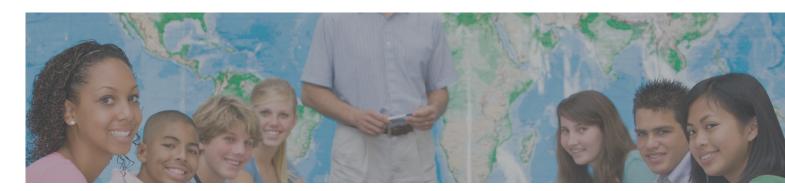
knowledge, abilities, and attitudes—evidence to be used in making meaningful, moment-to-moment, individualized decisions about what and how to teach and learn" (p. 152). Twyman further explains that:

Trace may be uniformly measured (as in standardized assessments); however, its measures are probably best determined by individual context. It should be observed frequently and in real time (as found in formative assessments). Trace may be represented as a permanent product (as found in student portfolios or project-based learning), recorded automatically (as found in some computer-based instruction), represented by other means (such as grades or badges), and detected by either the teacher or student (preferably both) using some form of measurement. In other words, trace is not one thing, but represents the numerous empirical, actionable methods to indicate a learner's current status and progression, in context. (p. 149)

In our consideration of learning habits, we stress that the traces of how the student learns are also important as the teacher personalizes learning and creates opportunities for each student to personalize her or his own learning.

WHY GIVE ATTENTION TO LEARNING HABITS?

Teachers are accustomed to gathering and analyzing data that show what a student knows, has learned, and has not yet learned. With this information, aggregated for the class, the teacher may alter her lesson plans to accelerate her pace or slow down to reteach. She may make notes to alter the lesson design for the next time she teaches the lesson. A teacher intent upon personalizing her instruction uses the data to adjust the assignments, supports, and expectations for each student based on that student's individual data. But without appropriate measures and careful analysis, data that show what a student knows do not tell much about how a student learns. To build more capable learners, the teacher must examine her students' learning habits and know how they learn and why they invest effort in learning.

We propose that a teacher can strengthen a student's learning habits by:

Step 1.

describing the student's typical pattern of behavior (habits) when addressing a learning challenge;

Step 2.

analyzing habits categorically in the four personal competencies;

Step 3.

isolating specific learning repertoires (SLRs) within the four competencies to strengthen;

Step 4.

adopting instructional techniques (interventions) to build the repertoires; and

Step 5.

aligning trace metrics to gauge change in the student's repertoires that result from the instructional intervention.

Table 1 illustrates a teacher's exercise to understand a student's learning habits, isolate competency-aligned repertoires to build, and determine trace metrics to track progress. Table 2 lists a variety of instructional techniques (or interventions) a teacher might employ to address the SLRs chosen for focus for Jimmy.

Jimmy's Learning Habits and Their Traces

Step 1: Description: Jimmy tackles math problems with relish, diving into them as if they were enticing puzzles, but he often falters in knowing the steps to a solution, becomes frustrated, and abandons the effort. Given a language arts assignment, Jimmy wilts in his desk, exasperation on his face; pretends to read; jots a couple semi-sentences; and pushes the paper aside. Jimmy rarely asks for help and is prone to diversionary behaviors that attract the attention of his classmates. To "personalize," the teacher might analyze Jimmy's learning habits and see what competencies need to be shored up. That information would be valuable feedback, alongside ongoing mastery data.

Table 1: Analysis of Jimmy's Learning Habits and Teacher's Personalization

Competency	Step 2: Habit Analysis	Steps 3–5: Personalization (Example SLRs, Techniques, and Traces)
Cognitive	In math, his tendency to start strong and hit a wall indicates adequacy in basic computational skills but weakness in problem solving with multistep equations. In language arts, his background knowledge, especially vocabulary, is generally insufficient for the tasks.	SLRs and techniques: Build fluency in math facts and math operations. Build breadth in prior knowledge and fluency in activation techniques. Trace: Student created graph of correct per minute of +, -, x, /, and intermixed math facts. Create a digital storyboard of critical figures in the American Revolution.
Metacognitive	Lacks a structured process for analyzing the requirements of a language arts (written) assignment and organizing the approach to completing it. Does not possess a habitual approach to unfamiliar words (e.g., list, define, apply in an original sentence).	SLRs and techniques: Use graphic organizers to simplify information and help structure information, with due dates or estimated time to complete indicated. Associate new words with known words, practice the new word in known context. Highlight unknown words when encountered and actively guess meaning from context and confirm or revise. Trace: Self-check of items within graphic organizer, tally of items completed within expectation. Create cumulative graph of new vocabulary words defined and used in three novel sentences.
Motivational	Displays greater perception of self-efficacy for math than language arts, perhaps because of past success, but this success is becoming less common. When motivation wanes, more likely because of faltering self-efficacy than low value for the mastery—desires success in school.	SLRs and techniques: Break down difficult tasks into smaller parts; check and celebrate completion of each part. Self-report (or public report) end-of-lesson checks for confidence with material. Trace: Use paper or digital 3-point rating to report on understanding after a lesson: ☺ ☺ ☹. Create portfolios representing "big ideas" learned. Consider badging for specific skills.
Social/emotional	Confronts situations that place heavy demands on his performance with behaviors to distract from the task and retreats from the challenge. Not wishing to admit inadequacy—and with limited skills of social interaction—is reticent to ask teacher or others for help. Growing anxiety in these situations hampers performance, and he lacks behaviors to resolve this tension.	SLRs and techniques: Discuss or role-play situations and practice component skills related to asking for help, acknowledging confusion. Embed multiple viable means for obtaining assistance and frequently assist others who need help with known material. Trace: Rate or score an end of period or day as "good," "neutral," or "not great" with a specific example. Use paper or digital tracking apps to acknowledge, celebrate, and track target component skills.

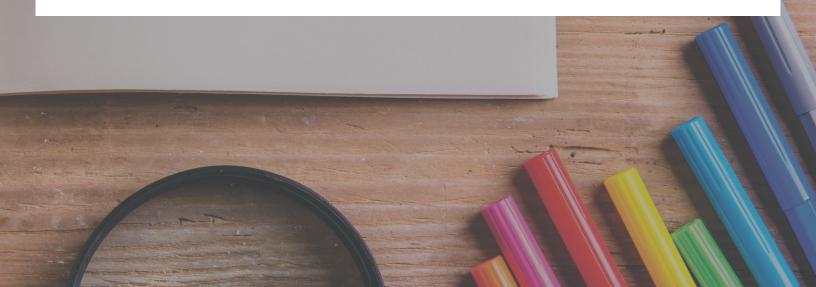# Personalization to Build Learning Habits

The ideal toward which every teacher aims is for the student to be cognizant of his or her own traces to such an extent that the student is able to build the appropriate repertoires to become a stronger learner. Nonetheless, the teacher who personalizes will appreciate tools that make practical the ideas we have presented here. Table 2 lists various techniques teachers employ to build students' personal competencies.

Table 2: Personalization Techniques

Competency	Personalization Techniques (Examples for Step 4)
Cognitive	COG 1: Reviewing prior learning and connecting it with newly introduced topics. COG 2: Expecting that specific knowledge is memorized and teaching memorization techniques. COG 3: Including vocabulary development (general vocabulary and terms specific to the subject) as learning objectives. COG 4: Identifying and teaching common facts, ideas, phrases, and quotations that the student will encounter in reading and discussion. COG 5: Assigning rich (complex) reading and the application of the reading in written work and discussion. COG 6: Encouraging each student's curiosity by providing pathways of exploration and discovery. COG 7: Reinforcing elements of mastered knowledge through review, questioning, and inclusion in subsequent assignments. COG 8: Using writing assignments to connect new learning with prior learning and deepen understanding. COG 9: Encouraging family activities that contribute to students' general knowledge.
Metacognitive	MET 1: Thinking out loud to show, by example, how a learning task is approached and pursued. MET 2: Pairing students as problem solver and active listener following instruction and modeling on the culture of thinking, as in the Think Aloud Paired Problem Solving (TAPS) method. MET 3: Teaching specific learning strategies and techniques, such as active listening, note taking, strategic reading, organization of content, access to resources, research, questioning, memorization (mnemonics), outlining, practice, analytical thinking, self-monitoring, and test preparation. MET 4: Teaching the learning process of (a) goal setting and planning (including choice of strategies), (b) monitoring progress through the plan's implementation, and (c) adapting the plan based on feedback (self-check, peer check, teacher appraisal). MET 5: Including self-checks or peer checks (or both) as part of assignment completion. MET 6: Showing how to chart and graph assignment completion and objective mastery. MET 7: Including the documentation of learning processes and strategies employed in the completion of an assignment. MET 8: Teaching the procedures of logic, synthesis, analysis, and evaluation to employ in critical thinking. MET 9: Teaching techniques for divergent thinking to expand the universe of considerations in creative thinking. MET 10: Helping parents build students' home study and reading habits.

Table 2: Personalization Techniques

Competency	Personalization Techniques (Examples for Step 4)
Motivational	MOT 1: Attributing learning success to effort and self-regulation, reinforcing the idea that both actual ability and self-efficacy are malleable and grow with practice; insisting on and reward persistence to mastery. MOT 2: Connecting learning tasks to the student's personal aspirations. MOT 3: Differentiating assignments to provide the right balance of challenge and attainability for each student. MOT 4: Helping students "find the fun" (satisfaction) in learning rather than simply making learning fun. MOT 5: Stretching the student's interests to find value in new topics (acquired relevance). MOT 6: Making individual student progress visible with clear indicators. MOT 7: Including student choice in assignments or topics. MOT 8: Providing high levels of student engagement aimed at learning objectives MOT 9: Helping parents understand the significance of their verbal attributions of students' successes and disappointments.
Social/ emotional	SEM 1: Including social/emotional objectives in the lesson plan. SEM 2: Teaching and reinforcing specific prosocial skills. SEM 3: Modeling or role playing responsible behavior, caring, optimism, and/ or positive verbal interactions. SEM 4: Establishing and reinforcing classroom norms for personal responsibility, cooperation, and concern for others. SEM 5: Guiding students in managing their behaviors in specific situations to control emotions. SEM 6: Helping students set and pursue constructive goals for personal development and social relationships. SEM 7: Teaching students to understand the consequences of their decisions and to attribute the consequences to their behavior. SEM 8: Using cooperative learning techniques in small group work. SEM 9: Teaching techniques for appropriate questioning to obtain information, seek help from others, and engage others in conversation. SEM 10: Engaging parents to promote social/emotional competency at home. SEM 11: Arranging support services from psychologists and social workers when students demonstrate need for support.

SUMMARY STATEMENT

In CIL's conception of personalized learning, personal competencies (cognitive, metacognitive, motivational, and social/emotional) are "essential repertoires" that converge in forming the student's learning habits, the patterns of behavior the student exhibits in pursuit of a learning goal. Learning habits can, and should, be intentionally established and strengthened through a teacher's skillful ordering of assignments and perceptive analysis of a student's underlying competencies.

Teachers know a student's typical pattern of behavior (habits) when addressing a learning challenge and can analyze these habits using the four personal competencies framework.

Teachers (and students) then identify SLRs within the competencies and provide more precise personalized instruction through selection of appropriate techniques, with aligned trace metrics (measurement).

A critical role of the teacher is to help the students build these learning habits and apply them in a multitude of familiar and unfamiliar situations.

GLOSSARY

1 Behavioral repertoire:

the range of skills and behaviors that might be exhibited by an individual at any point in time

2 Cognitive competency:

prior knowledge that facilitates new learning; includes curiosity focused on mastery that is retained in memory

3 Fluency:

the combination of accuracy plus automaticity that enables individuals to function efficiently and effectively in common and in novel situations; applied here to the process of learning or learning habits

4 Learning challenge:

desired mastery of skill and knowledge as set in a goal, task, or objective

5 Learning habits:

the conversion of individual competencies into coordinated patterns of behavior activated when confronting new learning challenges

6 Metacognitive competency:

self-regulation of learning and use of learning strategies

8 Personal competencies:

the individual's interrelated cognitive, metacognitive, motivational, and social/emotional competencies that facilitate learning and other forms of goal attainment

7 Motivational competency:

engagement and persistence in pursuit of learning goals

9 Social/emotional competency:

sense of self-worth, regard for others, and emotional understanding and management to set positive goals and make responsible decisions

10 Specific learning repertoire (SLR):

a component of skill and understanding within a personal competency that is combined with other SLRs as learning habits are engaged in pursuit of a learning goal

11 Trace:

the numerous empirical, actionable methods to indicate a learner's current status and progression, in context

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