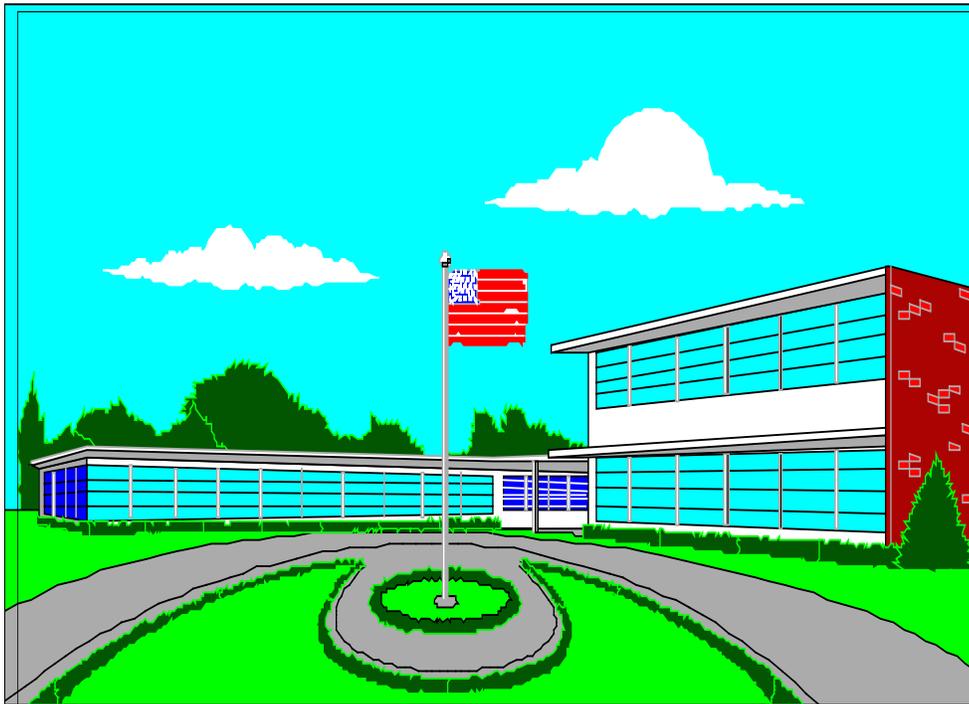


Schooling by Design: Identifying School-Wide Principles of Learning



presented by

Jay McTighe
Educational Consultant
Phone: 410-531-1610
e-mail: jmctigh@aol.com

Schooling by Design

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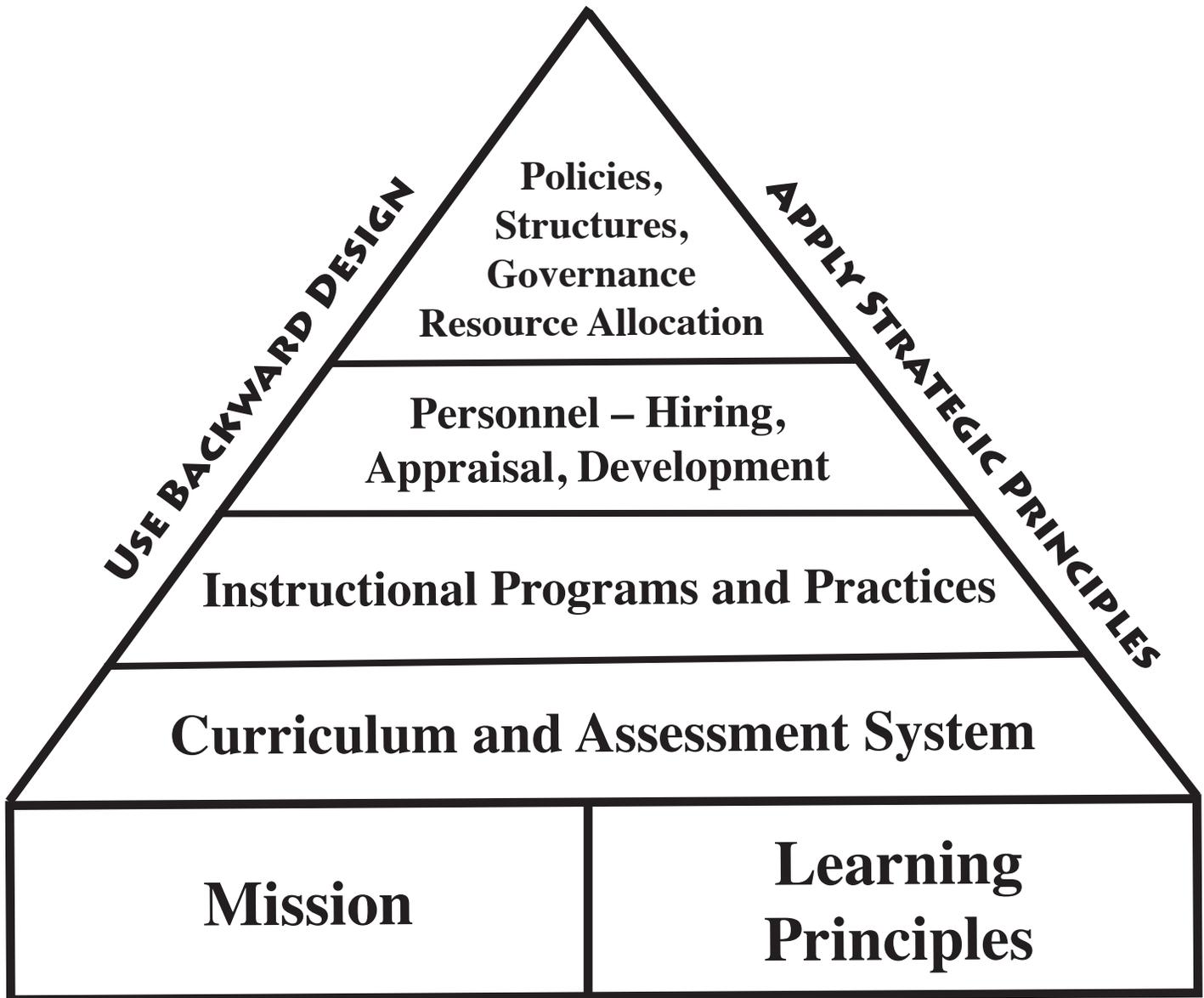
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Schooling by Design – Key Elements



Identifying School-wide Principles of Learning

Goal

An agreed-upon set of Principles of Learning for the school

Intent

Since the Learning Principles reflect research and best practice, they serve to guide curriculum planning, instruction and assessment. They provide a common language for conversations about teaching and learning, and function as criteria for a variety of school actions, (e.g., textbook selection, classroom observations).

Process

In order to build understanding and ownership, school staff should be actively involved in the process of identifying the shared Principles of Learning. One such process is outlined below:

Step 1 – Discuss the goal and intent of agreeing on a common set of Principles of Learning for the school.

Step 2 – Engage staff in the “Best Learning” exercise. Collect and compile a draft set of responses. (Note: Parents and students could also be involved in this exercise.)

Step 3 – Circulate the draft list of responses to the “Best Learning” exercise to staff groups (e.g., grade level teams, Departments, Division levels, etc.) for their review and recommendations.

Questions for consideration by the groups:

- *Does the list reflect all the important Principles of Learning?*
- *Are the principles clearly stated and understandable?*
- *What does each principle imply for our work? Would some established practices need to be changed to better align with a stated principle?*

Note: Additional examples of developed Learning Principles can also be reviewed at this time.

Step 4 – Each group submits suggested edits, additions, deletions, etc. to a designated team, which reviews the recommendations of the various groups and compiles a synthesized and edited list.

Step 5 – The edited list of Learning Principles is circulated for a second review. (If major edits are proposed, the process continues until a generally-agreed upon set of Learning Principles is produced.)

Step 6 – The final list of Learning Principles is presented for staff review and sign off. By signing, staff members commit to accepting and agreeing to acting on the agreed-upon Principles of Learning.

Note: The Learning Principles should not be “set in stone.” They can (and should) be periodically revisited and refined to reflect emerging research and staff insights from their application.

What Is Exemplary Design for Learning?

1. Think back to your many prior experiences with well-designed learning, *both in and out of school*. What was the most **well-designed learning experience** you have ever encountered as a learner? What features of the design - *not* the teacher's style or your interests - made the learning so **engaging and effective**? (Design elements include: challenges posed, sequence of activities, resources provided, assignments, assessments, groupings, teacher's role, etc.). Briefly describe the design, below:

2. In sharing your recollections and analyses with your colleagues, build a **list of generalizations that follow** from the accounts. What do well-designed learning experiences have in common? In other words, what must be built in "by design" for any learning experience to be maximally **effective and engaging** for students?

The best designs for learning...

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Schooling by Design: Key Learning Principles

1. The goal of all learning is fluent and flexible transfer – powerful use of knowledge, in a variety of contexts.
2. Meaning is essential to learning, hence it is essential to teaching and assessing: learning goals must make sense to the teacher and to the learner. There must be regular opportunities to see the value of what we are asked to learn, how it relates to past learning and how it will relate to future learning.
3. Successful learning requires metacognition: learning how to reflect, self-assess, and use feedback to self adjust. These metacognitive processes can (and should) be taught explicitly.
4. The complexity of learning requires teachers to draw upon a rich repertoire of teaching and assessing strategies carefully matched to the learning goals.
5. Learning is most effective when differences in learners' prior knowledge, interests and strengths are accommodated.
6. Greater learning depends upon the right blend of challenge and comfort – knowing that success is attainable, and realizing that persistent effort will pay off.
7. To maximize learning, learners need multiple opportunities to practice in risk-free environments, to receive regular and specific feedback related to progress against standards, and timely opportunities to use the feedback to re-do and improve.
8. All learning-related work in schools should be judged against standards related to learning goals (for both students and adults) and reflecting how people learn.
9. As a model learning community, a school appropriately requires learning from every member of its community, since continual learning is vital for institutional as well as personal success.
10. All learners are capable of excellent work, if the right conditions for learning are established.

Note that these principles apply to all members of the educational community, staff as well as students. These principles serve as standards against which any proposed reform of schools should be judged.

L.R.D.C. Principles of Learning

1. Learning is an active process in which the learner uses sensory input and constructs meaning out of it. The more traditional formulation of this idea involves the terminology of the active learner (Dewey's term) stressing that the learner needs to do something; that learning is not the passive acceptance of knowledge which exists "out there" but that learning involves the learner's engaging with the world.

2. People learn to learn as they learn: learning consists both of constructing meaning and constructing systems of meaning. For example, if we learn the chronology of dates of a series of historical events, we are simultaneously learning the meaning of a chronology. Each meaning we construct makes us better able to give meaning to other sensations which can fit a similar pattern.

3. The crucial action of constructing meaning is mental: it happens in the mind. Physical actions, hands-on experience may be necessary for learning, especially for children, but it is not sufficient; we need to provide activities which engage the mind as well as the hands.

4. Learning involves language: the language we use influences learning. On the empirical level, researchers have noted that people talk to themselves as they learn. On a more general level, there is a collection of arguments, presented most forcefully by Vigotsky, that language and learning are inextricably intertwined.

5. Learning is a social activity. Our learning is intimately associated with our connection with other human beings.

6. Learning is contextual. We do not learn isolated facts and theories in some abstract ethereal land of the mind separate from the rest of our lives: we learn in relationship to what else we know, what we believe, our prejudices and our fears.

7. One needs knowledge to learn. It is not possible to assimilate new knowledge without having some structure developed from previous knowledge to build on. The more we know, the more we can learn. Therefore any effort to teach must be connected to the state of the learner, must provide a path into the subject for the learner based on that learner's previous knowledge.

8. It takes time to learn: learning is not instantaneous. For significant learning we need to revisit ideas, ponder them, try them out, play with them and use them. If you reflect on anything you have learned, you soon realize that it is the product of repeated exposure and thought. Even, or especially, moments of profound insight, can be traced back to longer periods of preparation.

9. Motivation is a key component in learning. Not only is it the case that motivation helps learning, it is essential for learning. This idea of motivation as described here is broadly conceived to include an understanding of ways in which the knowledge can be used. Unless we know "the reasons why," we may not be very involved in using the knowledge that may be instilled in us, even by the most severe and direct teaching.

Source: Lauren Resnick, Director Learning Research and Development Center University of Pittsburgh

Learner-Centered Psychological Principles: A Framework for School Redesign and Reform

Cognitive and Metacognitive Factors

1. *Nature of the learning process*..... The learning of complex subject matter is most effective when it is an intentional process of constructing meaning from information and experience.
2. *Goals of the learning process*..... The successful learner, over time and with support and instructional guidance, can create meaningful, coherent representations of knowledge.
3. *Construction of knowledge*..... The successful learner can link new information with existing knowledge in meaningful ways.
4. *Strategic thinking*..... The successful learner can create and use a repertoire of thinking and reasoning strategies to achieve complex learning goals.
5. *Thinking about thinking*..... Higher order strategies for selecting and monitoring mental operations facilitate creative and critical thinking.
6. *Context of learning*..... Learning is influenced by environmental factors, including culture, technology, and instructional practices.

Motivational and Affective Factors

7. *Motivational and emotional influences on learning*..... What and how much is learned is influenced by the learner's motivation. Motivation to learn, in turn, is influenced by the individual's emotional states, beliefs, interests, and goals, and habits of thinking.
8. *Intrinsic motivation to learn*..... The learner's creativity, higher order thinking, and natural curiosity all contribute to motivation to learn. Intrinsic motivation is stimulated by tasks of optimal novelty and difficulty, relevant to personal interests, and providing for personal choice and control.
9. *Effects of motivation on effort*..... Acquisition of complex knowledge and skills requires extended learner effort and guided practice. Without learners' motivation to learn, the willingness to exert this effort is unlikely without coercion.

Developmental and Social Factors

10. *Developmental influences on learning*..... As individuals develop, there are different opportunities and constraints for learning. Learning is most effective when differential development within and across physical, intellectual, emotional, and social domains is taken into account.
11. *Social influences on learning*..... Learning is influenced by social interactions, interpersonal relations, and communication with others.

Individual Differences

12. *Individual differences in learning*..... Learners have different strategies, approaches, and capabilities for learning that are a function of prior experience and heredity.
13. *Learning and diversity*..... Learning is most effective when differences in learners' linguistic, cultural, and social backgrounds are taken into account.
14. *Standards and assessment*..... Setting appropriately high and challenging standards and assessing the learner as well as the learning progress—including diagnostic, process, and outcome assessment—are integral parts of the learning process.

Source: American Psychological Association (1995). *Learner-centered psychological principles: A framework for school redesign and reform*. Washington, D. C.: American Psychological Association. (12 p.)

Seven Principles of Learning*

1. Learning with understanding is facilitated when new and existing knowledge is structured around the major concepts and principles of the discipline.
2. Learners use what they already know to construct new understandings.
3. Learning is facilitated through the use of metacognitive strategies that identify, monitor, and regulate cognitive processes.
4. Learners have different strategies, approaches, patterns of abilities, and learning styles that are a function of the interaction between their heredity and prior experiences.
5. Learners' motivation to learn and sense of self affects what is learned, how much is learned, and how much effort will be put into the learning process.
6. The practices and activities in which people engage while learning shape what is learned.
7. Learning is enhanced through socially supported interactions.

Principles of Instruction for Understanding*

Teaching for conceptual understanding in advanced mathematics and science courses:

1. Maintains students' focus on the central organizing themes and underlying concepts of the discipline.
2. Is based on careful consideration of what students already know, their ideas and ways of understanding the world, and the patterns of practice they bring into the classroom.
3. Focuses on detecting, making visible, and addressing students' often fragile, underdeveloped understandings and misconceptions.
4. Reflects an understanding of differences in students' interests, motivations, preferences, knowledge, and abilities.
5. Is designed to provide the appropriate degree of explicitness for the situation and the abilities of the learners.
6. Recognizes students' preferences for and varying abilities to process different symbol systems, such as language (written and spoken), images, and numerical representations, by employing multiple representations during instruction.
7. Engages students in worthwhile tasks that provide access to powerful mathematical and scientific ideas and practices; moves students to see past the surface features of problems to the deeper, more fundamental principles; and develops their conceptual understanding.
8. Structures learning environments in which students can work collaboratively to gain experience in using the ways of thinking and speaking used by experts in the discipline.
9. Orchestrates classroom discourse so that students can make conjectures, present solutions, and argue about the validity of claims, thus helping them explore old understandings in new ways, reveal misconceptions, and generalize and transfer their learning to new problems or more robust understandings.
10. Provides explicit instruction in metacognition as part of teaching in the discipline.
11. Uses various kinds of formal and informal formative assessments to monitor students' understanding and target instruction effectively.
12. Creates expectations and social norms for the classroom that allow students to experience success and develop confidence in their abilities to learn.

*Source: Committee on Programs for Advanced Study of Mathematics and Science in American High Schools

Characteristics of the Best Learning Designs...

(based on surveys of K-16 faculty throughout the nation)

Expectations *the best learning designs...*

- provide clear learning goals and performance expectations.
- cast learning goals in terms of genuine/meaningful performance.
- frame the work around genuine questions & meaningful challenges.
- show models/exemplars of expected performance.

Instruction *in the best learning designs...*

- the teacher serves as a facilitator/coach to support the learner.
- targeted instruction and relevant resources are provided to “equip” students for expected performance.
- the textbook serves as one resource among many (i.e., text is resource, not syllabus).
- the teacher “uncovers” important ideas/processes by exploring essential questions and genuine applications of knowledge and skills.

Learning Activities *in the best learning designs...*

- individual differences (e.g., learning styles, skill levels, interests) are accommodated through a variety of activities/methods.
- there is variety in work, methods and students have some choice (e.g., opportunities for both group and individual work).
- learning is active/experiential to help students “construct meaning”.
- cycles of *model-try-feedback-refine* anchor the learning

Assessment *in the best learning designs...*

- there is no mystery as to performance goals or standards.
- diagnostic assessments check for prior knowledge, skill level, and misconceptions.
- students demonstrate their understanding through “real world” applications (i.e., genuine use of knowledge and skills, tangible product, target audience).
- assessment methods are matched to achievement targets.
- on-going, timely, and descriptive feedback is provided.
- learners have opportunities for trial and error, reflection and revision.
- self-assessment is expected.

Sequence & Coherence *the best learning designs...*

- start with a “hook”, immerse the learner in a genuine problem/issue/challenge.
- move back and forth from whole to part, with increasing complexity.
- scaffold learning in “do-able” increments.
- teach as needed; don’t over-teach all of the “basics” first.
- revisit ideas – have learners rethink and revise earlier ideas/work.
- are flexible (e.g., respond to student needs; revise plan to achieve goals).

Analyzing Current Practices Against Best Learning Designs

3 = consistently 2 = sometimes 1 = rarely/never

Expectations	<i>To what extent does my/our designs...</i>		1	<input type="checkbox"/>
• provide clear learning goals and performance expectations (i.e., no mystery for learners)?			2	<input type="checkbox"/>
• cast learning goals in terms of genuine/meaningful performance?			3	<input type="checkbox"/>
• frame the work around genuine questions & meaningful challenges?				<input type="checkbox"/>
• show models/exemplars of expected performance?				<input type="checkbox"/>

Instruction	<i>To what extent does my/our teaching...</i>		1	<input type="checkbox"/>
• provide targeted instruction and relevant resources to “equip” students for expected performance?			2	<input type="checkbox"/>
• use the textbook as one resource among many (i.e., the textbook is a resource, <i>not</i> the syllabus)?			3	<input type="checkbox"/>
• help “uncover” important ideas/processes by exploring essential questions?				<input type="checkbox"/>

Learning Activities	<i>To what extent does my/our learning activities...</i>		1	<input type="checkbox"/>
• address individual differences (e.g., learning styles, skill levels, interests) through a variety of activities/methods (vs. “one size fits all”)?			2	<input type="checkbox"/>
• provide variety in work, methods and students have some choice (e.g., opportunities for both group and individual work)?			3	<input type="checkbox"/>
• include inquiry/experiential opportunities to help students “make meaning” for themselves?				<input type="checkbox"/>
• incorporate cycles of <i>model-try-feedback-refine</i> learning experiences?				<input type="checkbox"/>

Assessment	<i>To what extent does my/our assessments...</i>		1	<input type="checkbox"/>
• provide appropriate measures of <i>all</i> of the learning goals?			2	<input type="checkbox"/>
• ask students to demonstrate their understanding through “real world” applications?			3	<input type="checkbox"/>
• provide on-going, timely, and descriptive feedback to learners?				<input type="checkbox"/>
• include opportunities for trial and error, reflection and revision?				<input type="checkbox"/>
• allow self-assessment by the learners?				<input type="checkbox"/>

Sequence & Coherence	<i>To what extent does my/our designs...</i>		1	<input type="checkbox"/>
• include pre-assessments to check for prior knowledge, skill level, and misconceptions?			2	<input type="checkbox"/>
• begin with a “hook” (e.g., immerse the learner in a genuine problem/issue/challenge)?			3	<input type="checkbox"/>
• move back and forth from whole to part, with increasing complexity?				<input type="checkbox"/>
• scaffold learning in “do-able” increments?				<input type="checkbox"/>
• revisit important ideas/questions and allow learners to rethink and revise earlier ideas/work?				<input type="checkbox"/>
• remain flexible (e.g., to respond to student needs; allow revisions to achieve goals)?				<input type="checkbox"/>

