

Lessons Learned From Excellent Teachers: Ten Powerful Instructional Principles

**"Not only is there an art in knowing a thing,
but also an art in teaching it"
Cicero**

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Introduction

Purposes:

To remind you, to make you aware, or to inform you of some basic instructional principles and

To show you how these principles can be converted to practical procedures.

These principles of excellent instruction may help you in

1. understanding the reasons for teaching a certain way,
2. designing new instruction in a creative and flexible manner,
3. redesigning existing instruction, and
4. providing a vocabulary and a simplified checklist for instruction.

Goal:

You will be able to observe the use of instructional principles in teaching.

Objective:

Given a portion of a lesson, you will state which procedures were applications of the ten principles.

Agenda:

1. Listen to an explanation of several (3-3-3-1) of the ten principles at a time.
2. Observe a portion of a lesson and identify applications of the principles using guiding questions.

Principle 1: Meaningfulness

An instructor helps students make connection between a topic and the students'

- past experiences
- present situations, needs interests, values
- future goals and aspirations

so they will want to learn to meet their needs.

Procedure: Relate each topic to students' motives

Questions:

1. What if students don't make the connection between what's taught and their

past experiences,

present interests and

future situations?

2. How do you help students make the connections?

a. Find their interests, needs, aspirations and fears

b. Find a relationship between the topic and their motives.

c. Appeal to those motives.

Principle 2: Prerequisites

An instructor finds what students know and helps them build upon what they know, so students will be mentally ready to learn.

Procedure: Check for and adjust to students' knowledge

Questions:**1. What are the dangers in not finding out what students know?**

Students are unprepared

Students are frustrated

Instructor and students waste time

2. What are the dangers in finding out what students know?

Time consuming

Students feel dumb

Instructors feel they have to act

Difficult to analyze prerequisites

3. How to can you find out what a student knows while limiting the dangers?

a. Choose a safe efficient assessment that gains enough information worth the time spent pretesting.

b. Choose a strategy to deal with the differences found, a strategy worth doing for the gain in learning.

1) Individualize (If you have \$ & time)

2) Group (If group level materials and assistants)

3) Whole group: bring all the same level for a few key prerequisite ideas or skills.

Principle 3 : Open communication

An instructor tells or guides students to know what they need to learn so they can proceed efficiently.

Procedure: State learning expectations.

1. What does open communication imply that you tell students?
2. What is the most critical information students need at the start of a new learning segment to build trust and positive expectations?
 - a. Uses: Why learn this content?
Exactly how they will use the content in some referent system, e.g.,
How does this relate to their daily lives and to their possible vocations?
What are consequences of those uses?
 - b. Objectives: What students are to learn to do
 - c. Tests: How students will be tested
Sample test instructions and criteria &/or sample test questions.
 - d. Overviews of the content
 - e. Agendas of the activities in the segment

Principles 4: Give priority to organized, essential ideas
5: Use learning aids
6: Provide novelty

An instructor assigns most instructional time to well-structured, important content to promote recall.

An instructor uses aids to ease learning and teaching.

An instructor varies actions and activities to keep attention.

Procedure: Explain the essentials of the subject, or have students acquire the knowledge, in an organized, efficient and attention-getting manner.

Principle 4: Give priority to organized, essential ideas

Questions:

1. What questions should you ask to choose essential content?

a. Ask:

What would people have to do to demonstrate to you that they knew an idea or skill?

What steps are needed to do that performance?

(That's your instructional objective and task description.)

b. Ask:

What should definitely be taught so students are able to demonstrate the idea or the skill?

List the ideas related to the task.

(That's your essential knowledge.)

2. How to use organization to teach essentials efficiently?

Principle 5: Use learning aids

Save time and make learning easy by using aids.

Questions:

1. What are some learning aids?

- a. Flow diagrams
- b. Outlines
- c. Charts and pictures
- d. Decision aids and decision trees
- e. Narrative task descriptions
- f. Checklists
- g. Annotated models

2. How to use learning aids to ...

- a. save time?
- b. help recall?
- c. make important ideas salient and easy to note?
- d. increase the number of people taught?

Principle 6: Provide novelty

Grab and keep attention.

Questions:

1. How does attention work?

2. How can you keep attention?

a. Be dynamic in voice and movement

**(using the right amount and
not in a distracting way.)**

b. Use

questions,

puzzles,

cases,

concrete analogies, and

unexpected events.

c. Break up explanations with

examples,

demonstrations,

practice and

feedback.

Principle 7: Modeling

An instructor arranges for students to see a demonstration so they will learn easily and quickly.

An instructor provides an enthusiastic, professional appearance to be imitated.

Procedure: Demonstrate mental, interpersonal and physical skills to be practiced, with clarity and enthusiasm.

Questions:

1. Is it easy to demonstrate?

2. How do you design a demonstration so students will learn in the least time and effort?

a. Four steps (WASDM)

1) "You Will do it."

2) "Here's what to Attend to and observe..."

3) Say and then Do.

4) "Memorize the steps you are to do."

3. How should you act as a model of professional behavior?

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- Principles 8: Active, appropriate practice
 9: Encouraging conditions and consequences

An instructor makes sure students practice what is required on "tests" and in the real world to foster recall, understanding and transfer.

(This produces competence)

An instructor arranges encouraging conditions, to produce enjoyment of subject matter and positive student self esteem

(This produces confidence)

Procedure: Provide realistic and individual practice for the test and complete, encouraging feedback in a psychologically-safe atmosphere.

Principle 8: Active, appropriate practice

Questions

1. Why active practice?

- a. so students recall
- b. so teachers know if participants are learning

2. How to provide active practice?

- a. Insure that each individual gets practice, e.g.,
 - 1) Programmed lecture
 - 2) Think-pair-share

3. What is appropriate practice?

- a. Practice conditions and performance match the test.
- b. The test matches the "real world."

4. How to provide objective-oriented practice?

- a Use high fidelity simulations - "real problems" ASAP
- b. Require advanced supervised practice using many, varied and progressively more difficult experiences.

Principle 9: Encouraging conditions and consequences

Questions**1. Why encouraging conditions and consequences?**

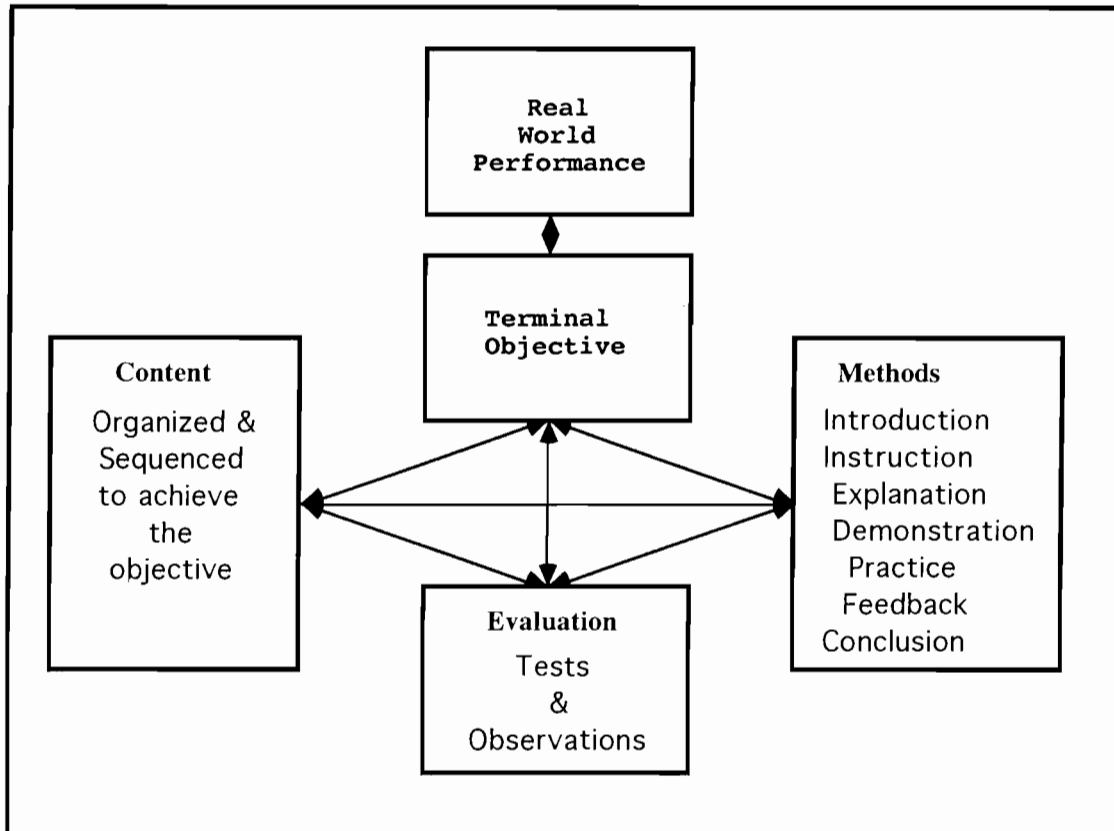
- a. How do students learn to hate a subject?
- b. We can counteract neutral and negative attitudes by avoiding the association of displeasure with the subject and with learning.

2. How to provide encouraging conditions and consequences?

- a. Make the learning environment psychologically safe.
- b. Give psychologically safe feedback.
 - 1) State complete feedback
What's right,
what's wrong,
what should have been done, and
what to do next,
to be complete.
 - 2) On skills and reports,
use checklists to be objective.
 - 3) Student checks self first,
for self assessment and
to provide control.
 - 4) Reward with a "reward sandwich" including
comments about performance, not personality,
to enhance confidence and
to attribute success to effort.

Principle 10: Consistency of instructional elements

The secret of instructional design: All instructional elements are consistent



I call the thinking that underlies the structure of instruction the **Secret of Instructional Design**. It is based on the work of Ralph Tyler, a curriculum specialist from the 1940's. The idea is simple: there are certain components we need in an effective piece of instruction, and each component has to be consistent with the others.

Cruz, B.J. "Measuring the transfer of training," *Performance Improvement Quarterly*, 1997, 10 (2) 83-97

Tyler, R.W., *Basic Principles of Curriculum and Instruction*. Chicago: University of Chicago Press, 1950.

Yelon, S. L. and Berge, Z. L. "The Secret of Instructional Design," *Performance and Instruction Journal*, 1988, 27, 11-13.

Yelon, S. L. *Powerful Principles of Instruction*. New York: Addison Wesley/Longman, 1996.

Summary: Here's one way to teach a lesson using the principles:

1. **Motivation**

Help students perceive the meaningfulness of the topic.

2. **Objective**

Communicate openly or help students find what is to be learned and what is "on the test."

3. **Review**

Go over the prerequisites so students are up to par.

4. **Overview**

Show the organization of the essential content to come.

5. **Agenda**

Tell students the schedule for instruction.

6. **Explanation**

With aids, explain the essential information enthusiastically.

7. **Demonstration**

Show students how to do what they will have to do on the practice, the test and in the real world.

8. **Practice**

Have each student perform what he or she will do on the test and in the real world.

9. **Feedback & remediation**

Tell students openly what they did well, poorly and what they should do. Include more practice as needed.

10. **Test**

Check the students' performance as called for in the objective, as demonstrated and as practiced.

Therefore, one version of a complete outline of a lesson might contain:

1. Introduction (Note: For starting Courses, Units and Lessons.)

- a. Motivation - Why learn to achieve this objective – uses and payoffs.
- b. Objective - What they will learn to do. What's on the "test."
- c. Overview/Advance Organizer – Main ideas/ parts of the subject, how the parts are related to each other and the objective. Where this lesson fits overall.
- d. Review of past - What students have learned that they must recall and use now to learn.
- e. Agenda - The order of the activities in the segment, i.e., the schedule.

2. Instruction Core

- a. Explanation - The essential information that students need so as to perform.
- b. Demonstration - How to do the practice, the test and the real action.
- c. Practice - Each student performs what's on the test and in the real world.
- d. Feedback and remediation - Tell students openly what they did well, what they did poorly and what they should do. Include more practice as needed.

3. Conclusion (Note: For ending Courses, Units and Lessons.)

- a. Summary of main ideas - The main parts of the subject matter and how the parts are related to each other and the objective.
- b. Integration with other segments - How the segment they learned relates to other segments.
- c. Objectives - What students have learned to do.
- d. Motivation - Why use in the real world what they have learned .
- e. Test - Assess what students have learned.

*N.B.: Any element can be carried out by asking students to fulfill the instructional function, rather than having the teacher do it. Teachers may use statements or activities to fulfill any function. Functions may last seconds or hours. The order of functions may vary.

Activity

1. In what ways are meaningfulness, prerequisites and open communication used in the instruction?
2. In what ways are organized essential content, providing aids and novelty used in the instruction?
3. In what ways are modeling, active, appropriate practice and encouraging conditions and consequences used in instruction?
4. In what ways is the "Secret of Instructional Design" used in the whole lesson?

Selected References

Davis, R., Alexander, L. & Yelon, S. (1974)

Learning System Design

McGraw Hill

Gagne, R. (1985)

The Conditions of Learning and Theory of Instruction

Holt Rinehart and Winston

Mager, R. (1997)

Making Instruction Work

Center for Effective Performance

Reigeluth, C. (1984)

Instructional Design Theories and Models

Lawrence Erlbaum Associates

Yelon, S. (1992) Classroom Instruction

Chapter In: Human Performance Technology Handbook

Jossey Bass

Yelon, S. (1996)

Powerful Principles of Instruction

Longman Publishers USA

Yelon, S. (2002)

Goal-oriented Instructional Design

SLY Publishers (yelons@msu.edu)

How to Tie a Bowline Knot

Why learn to tie a bowline knot?

Have you ever gone boating or sailing?

Imagine self, child in water
(squash - slip)

Imagine rigging coming loose...

Have you ever gone hiking or climbing?

Imagine self, child on ledge
(squash - slip)

Imagine tent ties or packs coming loose...

Have you ever tied a package to mail or carry on a trip?

Imagine a package
(gradually slips and spills)

What you will learn to do ?

When given or thrown a rope during the day or the night, in a "safe" or simulated rescue situation, in any position on a ledge or in the water,

Tie a bowline knot

- around yourself (today)
- another person
- a package
- an object

- * according to the instructions
- * So that the knot does not slip
- * 2 times, each in less than 10 seconds

Here is what we will do today:

1. Why learn to tie the bowline knot? (Done)
2. What you will learn to do? (Done)
3. What are the main steps for tying a bowline?
4. Preview of the whole skill.
5. What you know that you will need today.
6. I will explain how to tie the bowline knot.
7. I will show you how to tie the bowline knot.
8. You will tie the knot.
 - With guidance
 - Independently
 - In advanced and varied situations
9. Wrap up for today and a final check.

Next time at the boat dock more advanced practice combined with other skills.

What are the
main steps
for
tying a bowline knot?

" H-L-A "

1. Hold the rope so you can tie it easily
2. Make a loop
3. Attach the loose end to the loop

Preview of the whole skill

Here's the whole skill to get the general idea.

What you know that you will need today.

1. Follow these instructions

Hold the two ends of the rope

- left end over right end
- make a simple knot
- right end over left end
- make a simple knot
- pull tight

2. Make a loop

("a tree coming from under the ground")

- put into the loop the loose end
from the bottom
- go around the " tree "
- put into the loop the loose end
from the top

3. Which is your dominant hand?

Now, how to tie a bowline knot.

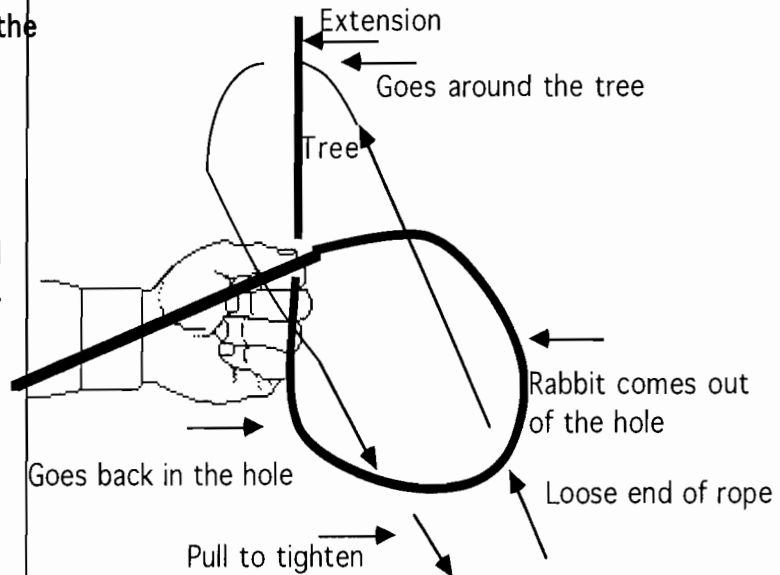
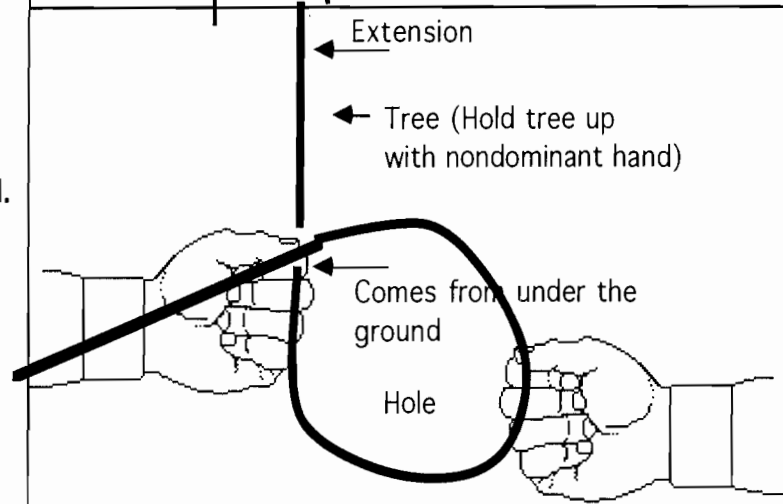
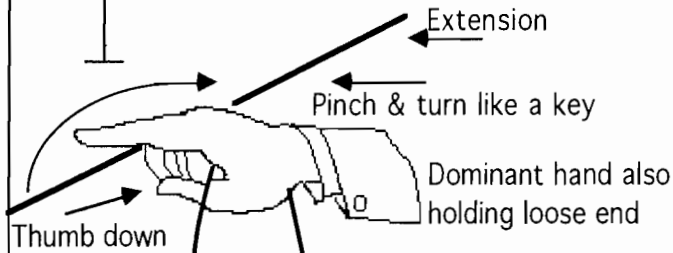
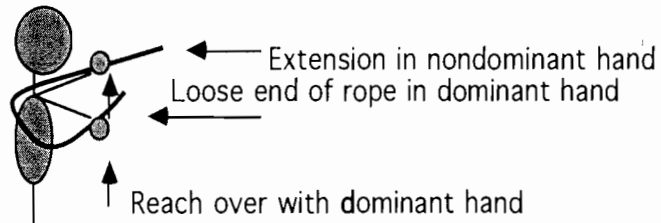
After I explain and demonstrate you will try it.

I will explain the steps first. Watch for these steps when I show you how to tie the knot.

Then when I show you how, I will say and do each step with you watching over my shoulder.

How to tie a bowline

1. Put rope around body.
2. Hold loose end in dominant hand, extension in other.
3. Reach over with dominant hand.
4. With thumb down, holding loose end, pinch and turn extension like a key.
5. Form a loop with a "tree," coming out of the ground.
6. Make loose end, the "rabbit", come out of the hole, go around the tree, and back in the hole.
7. Pull the loose end to make the knot.



Before you try the knot, what are the steps ?

Now you try it.

Ledges by day:

You tie the knot standing.

You tie the knot sitting.

You tie the knot lying.

Ledges at night:

Standing, eyes closed.

Sitting, eyes closed.

Lying, eyes closed.

Now let's go down to the pool...

Water by day:

Water at night:

Wrap up

1. What were the main steps ?
2. How does this relate to other units on boating ?
3. What did you learn to do ?
4. Why learn this skill ?

Final Check

Tie a bowline knot
around yourself
as if on a ledge & in pool (day/night)
2 times
each in less than ten seconds,
so the knot does not slip,
according to the task description.

Next time with simulated injuries to you,
tying the knot around others,
packages and rigging
in varied weather.