Monday, 20 February 2012, 2:45-3:45 p.m.
CS 3.6

SLO Down! How Observation and Reflection can improve assessment of course-level Student Learning Outcomes

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Published Program Abstract (page 29):
Discover how to use the inquiry process, observation of student behaviors, and reflection to strengthen assessment and achievement of course Student Learning Outcomes.

1. What should the student be able to do?
2. What does the student have to know in order to do #1 above?
3. How do course readings/activities help with these goals?

- It was said that Barbara Brown used observation and reflection to make deliberate decisions on changes in a course (on English composition).
- On a daily or weekly basis, reassess on a deliberate basis.
- The basis for assessment is shifted from the teacher to the student.
- Skillful teaching is required.
- Some observations are not obvious—take careful notice.
- What does student mastery look like?
- Expertise—The teacher's definition of this objective defines how we teach.
- The speakers characterized students as being either novices or experts. These two states look different.
- Through feedback from the audience, a "novice" was characterized as being inexperienced, confused, quiet, apprehensive. Also through feedback from those in attendance, an "expert" was characterized as having experience, having a structure for organizing information, being comfortable when they don't know something, being willing to share. There was a handout on "The Habits of Experts."
- We should realize that more often than not, our students are novices.
- Students do have a textbook.
- How do we read? (See handout on a student's perspective on reading an article on garlic mustard or AMF.)
- What are the hard parts of a course?

The speakers gave out photocopied pages from two textbooks and asked those in attendance to analyze these (using a handout). One of the passages was from a Political Science textbook, and the other was from an Anatomy and Physiology textbook. The point was that students may find textbooks difficult to read, for a variety of reasons—e.g., technical and non-technical vocabulary, context, background. A faculty person, on the other hand, may not readily see the potential areas of difficulty.
With regard to the Anatomy and Physiology textbook piece, the speakers then played a video called "Bone Rap" from YouTube to show another way to get across ideas in the classroom.

Two other handouts—one on SLOs and the other on a Reference list.

The Habits of Experts

- ☐ Experts ask good questions.
- ☐ Experts break problems into parts.
- ☐ Experts rely on evidence.
- ☐ Experts look for patterns.
- ☐ Experts consider other perspectives.
- ☐ Experts follow hunches.
- ☐ Experts use familiar ideas in new ways.
- ☐ Experts collaborate.
- ☐ Experts welcome critique.
- ☐ Experts revise repeatedly.
- ☐ Experts persist.
- ☐ Experts seek out new challenges.
- ☐ Experts know their own best work styles.

◆ Reprinted by permission from *Fires in the Mind: What Kids Can Tell Us About Motivation and Mastery*, by Kathleen Cushman and the students of What Kids Can Do. San Francisco: Jossey-Bass Publishers, 2008. For more information, go to www.firesinthemind.org

Thinking About my Reading Process

The strategies I used throughout this reading assignment were pretty basic. I read the questions first then read the article. During my reading I frequently highlighted things I felt were important and underlined words I was unsure of. I felt the most difficult thing for me to understand was the terminology. I did feel like the materials and methods section of the article was especially difficult to read for me perhaps because of all the steps. I felt myself continually having to look up words and then having to read and reread often because of the confusion. Since I did not have any prior knowledge about garlic mustard or AMF I found the article quite strange during the first read through. However, once I had read the article and got down most of the vocabulary I seemed to put things together a bit easier. Looking up the terminology and researching definitely helped me to understand the experiment better. I believe the graphs helped out a lot as far as a complete understanding. Although the article was challenging I felt that after I looked up the terms I had difficulty understanding it helped to comprehend the overall findings.

CHAPTER 7

Politics and Society in the New Republic

1787–1820

The power of the people, if uncontroverted, is licentious and mobbish.

—Fisher Ames, Massachusetts Federalist, 1794

Like an earthquake, the American Revolution shook the European monarchical order, and its aftershocks reverberated for decades. By "creating a new republic based on the rights of the individual, the North Americans introduced a new force into the world," the eminent German historian Leopold von Ranke warned the king of Bavaria in 1854, a force that might cost the monarch his throne. Before 1776, "a king who ruled by the grace of God had been the center around which everything turned. Now the idea emerged that power should come from below [from the people]."

Other republican-inspired upheavals — England's Puritan Revolution of the 1640s and the French Revolution of 1789 — ended in political chaos and military rule. Similar fates befell many Latin American republics that won independence from Spain in the early nineteenth century. But the American states escaped both social anarchy and military dictatorship. Having been raised in a Radical Whig political culture that viewed standing armies and powerful generals as instruments of tyranny, General George Washington left public life in 1783 to manage his plantation, astonishing European observers but bolstering the authority of elected Patriot leaders. "'Tis a Conduct so novel," American painter John Trumbull reported from London, that it is "inconceivable to People [here]."

The great task of fashioning representative republican governments absorbed the energy and intellect of an entire generation and was rife with conflict. Seeking to perpetuate the elite-led polity of the colonial era, Federalists celebrated "natural aristocrats" such as Washington and condemned the radical republicanism of the French Revolution. In response, Jefferson and his Republican followers claimed the Fourth of July as their holiday and "we the people" as their political language. "There was a grand democrat procession in Town on the 4th of July," came a report from Baltimore: "All the farmers, tanners, black-smiths, shoemakers, etc. were there . . . and afterwards they went to a grand feast."

Many people of high status worried that the new state governments were too attentive to the demands of such ordinary workers and their families. When considering a bill, Connecticut conservative Ezra Stiles grumbled, every elected official "instantly thinks how it will affect his constituents" rather than how it would enhance the general welfare. What Stiles criticized as irresponsible, however, most Americans welcomed. The concerns of ordinary citizens were now paramount, and traditional elites trembled.

The Political Crisis of the 1790s

The final decade of the eighteenth century brought fresh challenges for American politics. The Federalists split into two factions over financial policy and the French Revolution, and their leaders, Alexander Hamilton and Thomas Jefferson, offered contrasting visions of the future. Would the United States remain an agricultural nation governed by local officials, as Jefferson hoped? Or would Hamilton's vision of a strong national government and an economy based on manufacturing become reality?

The Federalists Implement the Constitution

The Constitution expanded the dimensions of political life by allowing voters to choose national leaders as well as local and state officials. The Federalists swept the election of 1788, winning forty-four seats in the House of Representatives; only eight Antifederalists won election. As expected, members of the Electoral College chose George Washington as president. John Adams received the second-highest number of electoral votes and became vice president.

Devising the New Government

Once the military savior of his country, Washington now became its political father. At age fifty-seven, the first president possessed great personal dignity and a cautious personality. To maintain continuity, he adopted many of the administrative practices of the Confederation and asked Congress to reestablish the existing executive departments: Foreign Affairs (State), Finance (Treasury), and War. He initiated one important practice: The Constitution required the Senate's approval for the appointment of major officials, but Washington insisted that the president had sole authority to remove them, thereby ensuring the executive's control of the bureaucracy. To head the Department of State, Washington chose Thomas Jefferson, a fellow Virginian and an experienced diplomat. For secretary of the treasury, he turned to Alexander Hamilton, a lawyer and his former military aide. The president designated Jefferson, Hamilton, and Secretary of War Henry Knox as his cabinet, or advisory body.

The Constitution mandated a supreme court, but the Philadelphia convention gave Congress the task of creating a national court system. The Federalists wanted strong national institutions, and the Judiciary Act of 1789 reflected their vision. The act established a federal district court in each state and three circuit courts to hear appeals from the districts, with the Supreme Court having the final say. The Judiciary Act also specified that cases arising in state courts that involved federal laws could be appealed to the Supreme Court. This provision ensured that federal judges would have the final say on the meaning of the Constitution.

The Bill of Rights

The Federalists kept their promise to add a declaration of rights to the Constitution. James Madison, now a member of the House of Representatives, submitted nineteen amendments to the First Congress; by 1791, ten had been approved by Congress and ratified by the states. These ten amendments, known as the Bill of Rights, safeguard fundamental personal rights, including freedom of speech and religion, and mandate legal procedures, such as trial by jury. By protecting individual citizens, the amendments eased Antifederalists' fears of an oppressive national government and secured the legitimacy of the Constitution. They also addressed the issue of federalism: the proper balance between the authority of the national and state governments. But that question was constantly contested until the Civil War and remains important today.

Hamilton's Financial Program

George Washington's most important decision was choosing Alexander Hamilton as secretary of the treasury. An ambitious self-made man of great intelligence, Hamilton married into the Schuyler family, influential Hudson River Valley landowners, and was a prominent lawyer in New York City. At the Philadelphia convention, he condemned the "democratic spirit" and called for an authoritarian government and a president with near-monarchical powers.

As treasury secretary, Hamilton devised bold policies to enhance national authority and to assist financiers and merchants. He outlined his plans in three path-breaking reports to Congress: on public credit (January 1790), on a national bank (December 1790), and on manufactures (December 1791). These reports outlined a coherent program of national mercantilism — government-assisted economic development.

Public Credit: Redemption and Assumption

The financial and social implications of Hamilton's "Report on the Public Credit" made it instantly controversial. Hamilton asked Congress to redeem at face value the $55 million in Confederation securities held by foreign and domestic investors (Figure 7.1). His reasons were simple: As an underdeveloped nation, the United States needed good credit to secure loans from Dutch and British financiers. However, Hamilton's redemption plan would give enormous profits to speculators, who had bought up depreciated securities. For example, the Massachusetts firm of Burrell & Burrell had paid $600 for Confederation notes with a face value of $2,500; it stood to reap a profit of $1,900. Such windfall gains offended a majority of Americans, who condemned the speculative practices of capitalist financiers. Equally controversial was Hamilton's proposal to pay the Burrells and other note holders with new interest-bearing securities, thereby creating a permanent **national debt**.

Hamilton's plan for a national debt owned mostly by the wealthy reawakened the fears of Radical Whigs and "Old Republicans." Speaking for the Virginia House of Burgesses, Patrick Henry condemned this plan "to erect, and concentrate, and perpetuate a large monied interest" and warned that it would prove "fatal to the existence of American liberty." James Madison challenged the morality of Hamilton's plan. He demanded that Congress recompense those who originally owned Confederation securities: the thousands of shopkeepers, farmers, and soldiers who had bought or accepted them during the dark days of the war. However, it would have been difficult to trace the original owners; moreover, nearly half the members of the House of Representatives owned Confederation securities and would profit personally from Hamilton's plan. Melding practicality with self-interest, the House rejected Madison's suggestion.

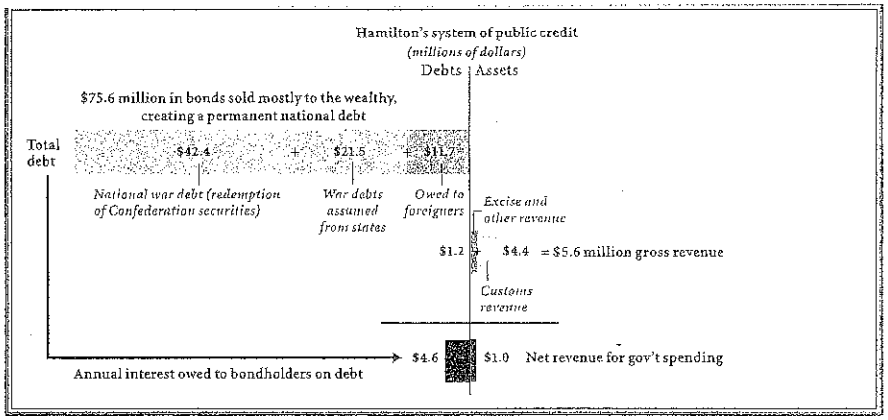


FIGURE 7.1 Hamilton's Fiscal Structure, 1792

As treasury secretary, Alexander Hamilton established a national debt by issuing government bonds and using the proceeds to redeem Confederation securities and assume the war debts of the states. To pay the annual interest due on the bonds, he used the revenue from excise taxes and customs duties. Hamilton deliberately did not attempt to redeem the bonds because he wanted to tie the interests of the wealthy Americans who owned them to the new national government.

Hamilton then proposed that the national government further enhance public credit by assuming the war debts of the states. This assumption plan, costing $22 million, also favored well-to-do creditors such as Abigail Adams, who had bought depreciated Massachusetts government bonds with a face value of $2,400 for only a few hundred dollars and would reap a windfall profit. Still, Adams was a long-term investor, not a speculator like Assistant Secretary of the Treasury William Duer. Knowing Hamilton's intentions in advance, Duer and his associates secretly bought up $4.6 million of the war bonds of southern states at bargain rates. Congressional critics condemned Duer's speculation. They also pointed out that some states had already paid off their war debts; in response, Hamilton promised to reimburse those states. To win the votes of congressmen from Virginia and Maryland, the treasury chief arranged another deal: He agreed that the permanent national capital would be built along the Potomac River, where suspicious southerners could easily watch its operations. Such astute bargaining gave Hamilton the votes he needed to enact his redemption and assumption plans.

Creating a National Bank

In December 1790, Hamilton issued a second report asking Congress to charter the Bank of the United States, which would be jointly owned by private stockholders and the national government. Hamilton argued that the bank would provide stability to the specie-starved American economy by making loans to merchants, handling government funds, and issuing bills of credit. These

Tortora, G. and Derrickson, B. Principles of Anatomy and Physiology, 13th ed. John Wiley and Sons, Inc. 2012.

TABLE 2.3

Percentage and Molarity

DEFINITION	EXAMPLE
Percentage (mass per volume)	
Number of grams of a substance per 100 milliliters (mL) of solution	To make a 10% NaCl solution, take 10 g of NaCl and add enough water to make a total of 100 mL of solution.
Molarity: 5 moles (mol) per liter	
A 1 molar (1 M) solution = 1 mole of a solute in 1 liter of solution	To make a 1 molar (1 M) solution of NaCl, dissolve 1 mole of NaCl (58.44 g) in enough water to make a total of 1 liter of solution.

atoms of specific elements. Table 2.3 describes these ways of expressing concentration.

Inorganic Acids, Bases, and Salts

When inorganic acids, bases, or salts dissolve in water, they **dissociate** (dis′-sō-sē-ĀT); that is, they separate into ions and become surrounded by water molecules. An **acid** (Figure 2.11a) is a substance that dissociates into one or more **hydrogen ions (H^+)** and one or more anions. Because H^+ is a single proton with one positive charge, an acid is also referred to as a **proton donor.** A **base,** by contrast (Figure 2.11b), removes H^+ from a solution and is therefore a **proton acceptor.** Many bases dissociate into one or more **hydroxide ions (OH^-)** and one or more cations.

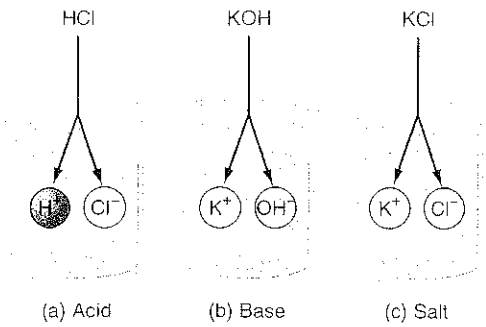
A **salt,** when dissolved in water, dissociates into cations and anions, neither of which is H^+ or OH^- (Figure 2.11c). In the body, salts such as potassium chloride are electrolytes that are important for carrying electrical currents (ions flowing from one place to another), especially in nerve and muscular tissues. The ions of salts also provide many essential chemical elements in intracellular and extracellular fluids such as blood, lymph, and the interstitial fluid of tissues.

Acids and bases react with one another to form salts. For example, the reaction of hydrochloric acid (HCl) and potassium hydroxide (KOH), a base, produces the salt potassium chloride (KCl) and water (H_2O). This exchange reaction can be written as follows:

$$\underset{\text{Acid}}{HCl} + \underset{\text{Base}}{KOH} \longrightarrow \underset{\text{Dissociated ions}}{H^+ + Cl^- + K^+ + OH^-} \longrightarrow \underset{\text{Salt}}{KCl} + \underset{\text{Water}}{H_2O}$$

Figure 2.11 Dissociation of inorganic acids, bases, and salts.

⑥ Dissociation is the separation of inorganic acids, bases, and salts into ions in a solution.



? The compound $CaCO_3$ (calcium carbonate) dissociates into a calcium ion (Ca^{2+}) and a carbonate ion (CO_3^{2-}). Is it an acid, a base, or a salt? What about H_2SO_4, which dissociates into two H^+ and one SO_4^{2-}?

Acid–Base Balance: The Concept of pH

To ensure homeostasis, intracellular and extracellular fluids must contain almost balanced quantities of acids and bases. The more hydrogen ions (H^+) dissolved in a solution, the more acidic the solution; the more hydroxide ions (OH^-), the more basic (alkaline) the solution. The chemical reactions that take place in the body are very sensitive to even small changes in the acidity or alkalinity of the body fluids in which they occur. Any departure from the narrow limits of normal H^+ and OH^- concentrations greatly disrupts body functions.

A solution's acidity or alkalinity is expressed on the **pH scale,** which extends from 0 to 14 (Figure 2.12). This scale is based on the concentration of H^+ in moles per liter. A pH of 7 means that a solution contains one ten-millionth (0.0000001) of a mole of hydrogen ions per liter. The number 0.0000001 is written as 1×10^{-7} in scientific notation, which indicates that the number is 1 with the decimal point moved seven places to the left. To convert this value to pH, the negative exponent (–7) is changed to a positive number (7). A solution with a H^+ concentration of 0.0001 (10^{-4}) moles per liter has a pH of 4; a solution with a H^+ concentration of 0.000000001 (10^{-9}) moles per liter has a pH of 9; and so on. It is important to realize that a change of one whole number on the pH scale represents a *tenfold* change in the number of H^+. A pH of 6 denotes 10 times more H^+ than a pH of 7, and a pH of 8 indicates 10 times fewer H^+ than a pH of 7 and 100 times fewer H^+ than a pH of 6.

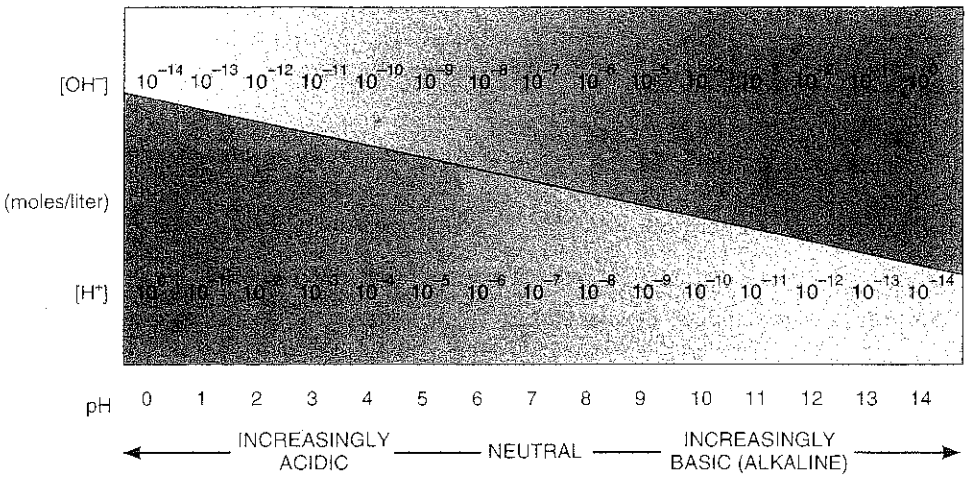
The midpoint of the pH scale is 7, where the concentrations of H^+ and OH^- are equal. A substance with a pH of 7, such as pure water, is neutral. A solution that has more H^+ than OH^- is an **acidic solution** and has a pH below 7. A solution that has more OH^- than H^+ is a **basic (alkaline) solution** and has a pH above 7.

Maintaining pH: Buffer Systems

Although the pH of body fluids may differ, as we have discussed, the normal limits for each fluid are quite narrow. Table 2.4 shows the pH values for certain body fluids along with those of some common substances outside the body. Homeostatic mechanisms maintain the pH of blood between 7.35 and 7.45, which is slightly more basic than pure water. You will learn in Chapter 27 that if the

Figure 2.12 The pH scale. A pH below 7 indicates an acidic solution—more H^+ than OH^-. A pH above 7 indicates a basic (alkaline) solution; that is, there are more OH^- than H^+.

The lower the numerical value of the pH, the more acidic is the solution because the H^+ concentration becomes progressively greater. The higher the pH, the more basic the solution.



At pH 7 (neutrality), the concentrations of H^+ and OH^- are equal (10^{-7} mol/liter). What are the concentrations of H^+ and OH^- at pH 6? Which pH is more acidic, 6.82 or 6.91? Which pH is closer to neutral, 8.41 or 5.59?

TABLE 2.4

pH Values of Selected Substances

SUBSTANCE*	pH VALUE
• Gastric juice (found in the stomach)	1.2–3.0
Lemon juice	2.3
Vinegar	3.0
Carbonated soft drink	3.0–3.5
Orange juice	3.5
• Vaginal fluid	3.5–4.5
Tomato juice	4.2
Coffee	5.0
• Urine	4.6–8.0
• Saliva	6.35–6.85
Milk	6.8
Distilled (pure) water	7.0
• Blood	7.35–7.45
• Semen (fluid containing sperm)	7.20–7.60
• Cerebrospinal fluid (fluid associated with nervous system)	7.4
• Pancreatic juice (digestive juice of the pancreas)	7.1–8.2
• Bile (liver secretion that aids fat digestion)	7.6–8.6
Milk of magnesia	10.5
Lye (sodium hydroxide)	14.0

*Bullets (•) denote substances in the human body.

pH of blood falls below 7.35, a condition called *acidosis* occurs, and if the pH rises above 7.45, it results in a condition called *alkalosis;* both conditions can seriously compromise homeostasis. Saliva is slightly acidic, and semen is slightly basic. Because the kidneys help remove excess acid from the body, urine can be quite acidic.

Even though strong acids and bases are continually taken into and formed by the body, the pH of fluids inside and outside cells remains almost constant. One important reason is the presence of **buffer systems,** which function to convert strong acids or bases into weak acids or bases. Strong acids (or bases) ionize easily and contribute many H^+ (or OH^-) to a solution. Therefore, they can change pH drastically, which can disrupt the body's metabolism. Weak acids (or bases) do not ionize as much and contribute fewer H^+ (or OH^-). Hence, they have less effect on the pH. The chemical compounds that can convert strong acids or bases into weak ones are called **buffers.** They do so by removing or adding protons (H^+).

One important buffer system in the body is the **carbonic acid–bicarbonate buffer system.** Carbonic acid (H_2CO_3) can act as a weak acid, and the bicarbonate ion (HCO_3^-) can act as a weak base. Hence, this buffer system can compensate for either an excess or a shortage of H^+. For example, if there is an excess of H^+ (an acidic condition), HCO_3^- can function as a weak base and remove the excess H^+, as follows:

$$\underset{\text{Hydrogen ion}}{H^+} + \underset{\text{Bicarbonate ion (weak base)}}{HCO_3^-} \longrightarrow \underset{\text{Carbonic acid}}{H_2CO_3}$$

Text and Task Analysis

Text Structures and Features (hierarchy of headings, text boxes, columns, headers, side bars, etc.)	Skill Sets (Student ability as reader to analyze content, manage organization of content, recognize tone and point of view etc.)	World Knowledge	Discipline Knowledge
Difficult to read	definitions of the words	places in the world - geography	

SLO: Name and describe organic molecules based on structural formulas.

Is there evidence of student mastery of the SLO?
Is there evidence of real-time assessment by the instructor?

Evidence	Interpretation

References

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