Teaching Chapter 6

**Achieving Peak Levels of Academic Performance:**

***Taking Tests,* *Writing Papers*, & *Making Presentations***

Key Instructional *Goals* of this Chapter

 The primary goal of this chapter is to help students acquire effective strategies for writing, speaking, and test-taking. A collateral goal of this chapter is to promote student awareness that writing and speaking are not just communication skills; they are also *lifelong* *learning* skills.

Key Points toEmphasize When Discussing *Test-Taking*

*\* Timing* matters: Test performance and test grades depend on what is done immediately *before* a test (e.g., timely review of major points or mnemonic devices), *during* a test (using effective test-taking strategies), and *after* a test (diagnosing errors so they don’t reoccur on subsequent tests).

\* Experiencing a *moderate* amount of anxiety or stress during an exam is not a bad thing; it indicates motivation and generates adrenalin, which can improve test performance.

\* If you have your students complete the *midterm-evaluation* exercise at the end of the chapter, this may be the prime time to raise such questions as:

(a) If you put in a lot of study time for your midterm exams and still did poorly, what happened? (b) What can you do now to reduce the likelihood that this doesn’t happen again on your finals?

(c) If you have an extremely low grade in a course at this point, how should you determine

 whether or not to *drop* the course or continue with it? (This may also be a propitious time to

 discuss the advantage and disadvantages of withdrawing from courses, and remind students

 who they should consult with before making this decision.)

(d) What grade-point average would put a student on *academic probation* or *academic warning*?

 What are the consequences of being on academic probation? What does it take to get off

 academic probation?

(e) What grades qualify a student for *academic* *awards and honors*? What specific types of

 academic awards and honors does the college bestow on high-achieving students (Dean’s

 List, Honors Program, Divisional Awards, etc.)?

Key Points toEmphasize When Discussing *Writing Papers*

\* As some of the student perspectives in this chapter suggest, academic integrity violations are not always the result of intentionally unethical behavior; they also result from lack of awareness or knowledge about how to properly cite and reference information. Thus, the topic of academic integrity may be covered in a non-threatening or guilt-inducing manner if it is introduced as preparation for research that all students are expected to conduct, rather than as a warning or chastisement for unethical behavior that only miscreants commit.

\* Underscore the fact that communicating via written words is more labor intensive than communicating orally. Emphasize that high-quality writing is a *multi-stage, multi-draft* process, even for professional writers and award-winning authors. Students should know that if they do not generate a high-quality written product on their first try, it does not indicate they are a poor or struggling writer; instead, it represents the “normal” first-draft stage in the process of effective writing. Students may also need to be reminded that writing is something that is not only done in English classes for English teachers, but is something that’s done *across the curriculum* and *throughout life* to improve learning, thinking, self-awareness, and both academic and professional performance.

\* It’s likely that students will need support for the communication skills discussed in this chapter for two reasons: (a) intentional development of these skills may have been given short shrift before college, and (b) each of these skills has the potential to trigger student stress (e.g., “writer’s block,” “communication apprehension” or “fear of public speaking”) Consequently, students may need to receive proactive and intrusive professional support in order to overcome these insecurities before they can be expected to reach their full potential as writers or speakers. Rather than immersing students in the process of using these skills in a sink-or-swim fashion, their fears and anxieties may need to be addressed intentionally and proactively by exposing students to professionals with expertise in these skill-development areas. Intrusive support may be provided by inviting these professionals to class or by bringing your class to the professionals (e.g., professionals in the Writing Center or Learning Center for writing skills, and professionals in the speech department for public speaking skills).

 Another effective strategy for combating fear or anxiety with respect to writing and speaking to have students develop these skills within the supportive context of a small group of peers. In the next section, you will find a variety of exercises and assignments for research, writing, and speaking that students can do in pairs, or in 3- or 4-member teams. It may even be possible to provide a social “scaffold” by having students practice these skills first in highly interdependent, small-group settings and gradually move them toward using the skills independently, or in a large-group setting. For example, students can start practicing oral communication skills at the beginning of the term while working in pairs, then they can progress to exercises done in larger 4-member groups, and later in the term, they make presentations in front of class—either individually or as a panelist.

\* Remind that students that fear of public speaking, although an extremely common experience, it is not an enduring personality trait; instead, it’s often a temporary state of apprehension related to anxiety *not knowing what to say* or being *judged negatively* by those who are listening to what we say. Just as test anxiety can be reduced or eliminated by studying and being prepared for tests, so too, can fear of public speaking be reduced or eliminated by becoming knowledgeable and coming prepared to speak.

 *Exercises & Assignments* for Chapter 6

*Writing* Exercises

***Reciprocal Letter Writing (a.k.a., Responsive Written Exchanges)***

Steps:

1. Have students pair up and write a personal letter to their partner based on sentence stems that

 you provide them. The stem could be an incomplete sentence about some aspect of college life

 that you’d like your students to share with each other (e.g., “My first impression of this

 college is . . . ” “What I like most about this college is . . .” “What has surprised me most

 about my college experience thus far is . . .”)

2. The letter should begin with the salutation, “Dear . . . .” and end with “P.S.: One personal

 thing about me you may not know is . . .”

3. The partners exchange letters, read them independently, and then write a response to their

 partner’s letter that’s focused on the issue introduced by the sentence stem. In addition, the

 letter recipient may also elect to write a P.S. in response to the P.S. of the letter sender.

4. Students keep these letters, or you can collect them, read them informally, and return them to

 students to include in an ongoing class journal (Fulwiller, in Millis & Cottell, 1998).

***Team Journal***

 In contrast to the traditional journal, for which the target audience is either the student who is doing the writing or the course instructor, the audience for the team journal is a group of peers who comprise the writer’s learning team.

Steps:

1. Student teams create a name for their journal, record the team’s name on the outside

 cover of a notebook, and list the names of all team members on the inside cover.

2. The journal is stored in a place where all teammates can readily access it (e.g., library

 reserve).

3. Once per week, team members record their own entries to the journal and respond to

 the entries of their teammates. (As course instructor, you don’t respond to or grade

 student entries; instead, simply spot check the journals at the end of each week to

 credit the contributing student and to ensure individual accountability.) (Renfro, in

 McQuade et al., 1991)

***Dyadic Essay Confrontation (DEC)***

Steps:

1. In response to an assigned reading, students develop an essay question that integrates the

 reading with previously covered material.

2. Students write a model answer to the essay question they developed.

3. During class time, students pair up, exchange essays questions, and write a spontaneous essay

 in response to the question they receive from their partner.

4. Students compare their spontaneous answers with the model answer, noting similarities and

 differences (Millis, Sherman, & Cottell, 1993).

# *Pair Paper Swap*

# Steps:

# 1. Students write a short paper, using a checklist of criteria, such as those suggested on pp. \_\_ of

#  this manual

# 2. While in class, have students form pairs, exchange papers with their partners, and evaluate

#  them according to the checklist of criteria you’ve provided.

# 3. Ask the students to suggest to their partners how the quality of their paper might be

#  improved with respect to one or more of the criteria on the checklist (Medina,

#  1997).

Exercises Relating to Writing Papers & Research Reports

***Case Studies: Is it or is it Not Plagiarism?***

The following are four incidents that were actually brought to a judicial review board to determine if plagiarism had occurred and, if so, what the penalty should be. After you read each case, answer the questions listed below it.

Case 1. A student turned in an essay that included substantial material copied from a published source. The student admitted that he didn’t cite the sources properly, but argued that it was because he misunderstood the directions, not because he was attempting to steal someone else’s ideas.

Is this plagiarism?

How severe is it? (Rate it on a scale from 1 = low to 10 = high)

What should the consequence or penalty be for the student?

How could the suspicion of plagiarism been avoided in this case?

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Case 2. A student turned in a paper that was identical to a paper submitted by another student for a different course.

Is this plagiarism?

How severe is it? (Rate it on a scale from 1 = low to 10 = high)

What should the consequence or penalty be for the student?

How could the suspicion of plagiarism been avoided in this case?

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Case 3. A student submitted a paper he wrote in a previous course as an extra-credit paper for a course.

Is this plagiarism?

How severe is it? (Rate it on a scale from 1 = low to 10 = high)

What should the consequence or penalty be for the student?

How could the suspicion of plagiarism been avoided in this case?

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Case 4. A student submits a paper in an art history that contains some ideas from art critics that she read about and whose ideas she agrees with. The student claimed that not citing these critics’ ideas wasn’t plagiarism because their ideas were merely their own subjective judgments or opinions, not facts or findings; and, furthermore, they were opinions that she agreed with.

Is this plagiarism?

How severe is it? (Rate it on a scale from 1 = low to 10 = high)

What should the consequence or penalty be for the student?

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Looking back at these four cases, which of them do you think represents the most severe and least severe violation of academic integrity? Why?

***Workstation Jigsaw***

Steps:

1. Following a presentation on information resources presented by a library science

 professional, either in class or at the college library (preferably the latter), assign your students

 a topic to research.

2. Form 4-member teams and give all groups the same list of four information resources

 discussed by the library science professional (e.g., published books, journals,

 periodicals, and different online databases or search engines).

3. Have teammates divide their labor, such that each member assumes the role of

 resource specialist for one of these information sources.

4. Teammates leave their “home team” to join a group of students who are “resource

 specialists” for the same information source. The teams work together to locate

 information from their particular resource that relates to their assigned topic. (Depending on

 the size of your class, you may want to subdivide these resource-specialist groups so they

 do not contain more than four students per group.)

5. Specialists return to their home teams, where they share the information they gleaned

 from their respective resource areas and integrate them into a composite team

 bibliography (Kagan & Kagan, 1998).

Note: A 6th step may be added to this procedure, whereby the team actually accesses

the information obtained from the different resources and presents it to the entire class as part of a small-group report or panel presentation.

***Team Anthologies***

# This is a complex, multi-stageprocedure that involves the following steps:

Steps:

1. Four-member teams decide on a topic to research.

# 2. Working individually, teammates construct a bibliography of important sources

#  relating to the topic they have chosen and submit it to the instructor.

# 3. The instructor returns their individual bibliographies and has students rejoin their

#  original teams to construct a composite bibliography, which builds on the individual

#  research conducted by each team member.

# 4. The team breaks up and each member works individually to prepare a reflective

#  commentary on a different bibliographic source, using a double-entry format in which

#  major points identified in the reading are listed on the left and personal reactions to

#  these points are listed on the right.

# 5. Two teammates join together, read each other’s source, and add their reflective commentary to

#  their partner’s commentary.

# 6. The paired teammates read each other’s reflective commentaries on the same article and then

#  jointly construct a composite annotation that summarizes their reading.

7. Pairs reconvene in four-member teams to complete an annotated bibliography of all

 articles they’ve reviewed, and include it as part of a final team product that also includes a

 cover sheet, an introduction, and conclusion (Millis, 1994).

***Specialized Research-Paper Evaluation***

Steps:

1. Students write a research paper individually and make four copies of their paper.

3. Four-member teams are formed, and each teammate brings four copies of her

 research paper to class to share with each of her teammates.

4. The instructor provides students with four copies of a checklist of criteria they will use

 to evaluate their paper (e.g., criteria relating to mechanics, organization, clarity of

 writing style, and supporting evidence).

5. Using the checklist of criteria provided by the instructor, each team member

 assumes the role of an evaluation specialist who focuses on one criterion for

 evaluating her teammates’ papers.

6. Each evaluation specialist take turns providing feedback to teammates with

 respect to her particular evaluation criterion, first noting the paper’s strengths and then

 noting any way(s) it might be improved (Medina, 1997).

Note: Another step may be added to this procedure, in which students turn in their individual papers to be graded. Adding this step provides a stronger incentive for students to actively listen to, and actually use, the feedback they receive from their peers to improve the quality of their paper.

***Simultaneous Group Research-Paper Evaluation***

 A variation of the above “Specialized Research-Paper Evaluation” procedure, in which all team members focus simultaneously on the same criterion, then proceed to the next criterion until all criteria have been discussed and applied to the evaluation of each teammate’s research papers (Medina, 1997).

***Assembly Line Research-Paper Evaluation***

 A variation of the above procedure (“Simultaneous Group Research-Paper Evaluation”), whereby separate teams specialize in evaluating their classmates’ research papers with respect to one criterion; papers are then passed successively from one team to the next—in “assembly line” fashion—until all papers have been evaluated with respect to all criteria on the checklist (Medina, 1997).

*Oral Communication* (*Public Speaking*) Exercises

***Team Stand & Share***

Steps:

1. Form 3- or 4-member teams and have them generate ideas with respect to some topic

 or issue of your choosing (e.g., causes of stress; strategies for overcoming shyness).

2. One team stands up and a member of that team reads what he believes is the most

 important or interesting item on the team’s list of ideas. After the item is read, other

 teams add the item to their list if they don’t already have it. (If they already have the

 same or similar idea, they place a check mark by it.)

3. After the first team member reads his favorite item, the list is passed to a teammate

 who reads her favorite unmentioned idea. This process continues until all items on the

 team’s list have been shared. The team then sits down, and a new team stands and

 shares its unmentioned ideas.

4. The process continues until all teams have stood up and the distinctive ideas of all

 teams have been shared (Kagan & Kagan, 1998).

Note: In a less time-consuming version of this procedure, each team decides on

which of their ideas is the best one and only shares that idea before another team

takes its turn (Kagan, 1998).

***Stand & Share***

This is a modified version of the previous procedure (“Team Stand & Share”) in which individual members from different teams successively stand to share one idea generated by their team, being sure not to repeat an idea that was already stated by another team. This rotational process continues—with a new member from each team standing and reporting different ideas on successive turns—until all unique or distinctive ideas generated by each team have been reported to the entire class (Kagan, 1992).

# *Rapid Report Wave*

#  A slightly modified version of the above procedure (“Stand & Share”) in which students are encouraged to stand and share their ideas in rapid, round-robin fashion— simulating the “wave” displayed by spectators at sporting events (Cuseo, 2000).

***Representative Reporting Groups***

Steps:

1. Following a small-group discussion, one representative from each group volunteers (or

 is randomly selected) to share his team’s ideas as part of a panel of representative

 reporters—who occupy seats in front of class.

2. Two additional chairs may be included at the front of the room: (a) one chair for any

 student who would like to come up and ask a question or request clarification on the

 ideas presented by the panelists, and (b) one chair for the instructor—who moderates

 the panel and highlights key differences or recurrent themes expressed by the group

 representatives (Abrami, 1995).

Note: This procedure may be modified slightly to have it simulate the TV game show, *Who Wants to be a Millionaire* by allowing panelists to seek “lifeline” assistance by “phoning a friend” (asking a teammate) or polling the audience (members of the class).

Additional Material for Possible Use in Lectures or Reading Assignments Excised from the First Edition of the Textbook

Test-Preparation Strategies

\* Try to match your study environment as closely as possible to the test environment.

Athletic teams hold their last practice sessions on the field where they will actually play so that their practice environment and performance (game) situation match as closely as possible. Theatrical performers also practice their dress rehearsals on the same set where they will actually perform. Similarly, you want to make your last study (practice) session as similar to the test environment as possible in order to maximize transfer of what you’ve learned in your study situation to the test situation. For example, if you know how many essay questions you’ll need to answer and the total amount of time you’ll have to answer them, it's best to practice writing the same number of essays under the same time deadline that you'll experience in the actual test situation.

Studies show that when students take a test in the same environment they studied in, they tend to remember more of that information at test time than do students who study in one place and take the test in a different place (Smith, Glenberg, & Bjork, 1978). While it's unlikely that you’ll be able to do all your studying in the same room that you'll take your test in, it may be possible to do your final review in your classroom or in an empty classroom with similar features. This could strengthen your memory for the information you study because the features of the room in which you studied the information becomes associated with the information you studied; when you see these features again at test time, it may help trigger memory of the information you studied (Tulving, 1983).

Other studies demonstrate that if students are exposed to a distinctive or unique aroma while they are studying (e.g., the smell of chocolate) and are exposed to that same smell again during a later memory test, they display better memory for the information they studied than do students who didn’t study and take the test with the same aroma present (Schab, 1990). Perhaps one practical application of this finding is to wear a distinctively smelling cologne or perfume while studying, and use it again on the day of the test. This might improve your memory for the information you studied by matching the scent of your study environment with the scent of your test environment. Although this strategy may seem silly, keep in mind that the area of the human brain where smell is perceived has connections with the brain’s memory pathways (Jensen, 1998). This may account for why people commonly report that certain smells can trigger memories of past experiences (e.g., the smell of a summer breeze triggering memories of summer games played during childhood). Thus, don’t underestimate the sense of smell’s potential for promoting memory.

\* Use effective test preparation to reduce test anxiety

Studies show that college students who are well prepared for exams not only achieve higher test scores; they also experience lower test anxiety (Zohar, 1998). There's also evidence that college students who display greater amounts of procrastination also experience higher levels of test anxiety (Rothblum, Solomon, & Murakami, 1986). High levels of pre-test tension associated with rushing and late-night cramming are likely to carry over to the test itself, resulting in higher levels of test-taking tension. Furthermore, loss of sleep caused by previous-night cramming is likely to decrease your amount of dream (REM) sleep, which, in turn, will likely increase the level of anxiety you experience the following day--test day. Avoiding cramming for exams reduces test anxiety by eliminating pre-test anxiety created by the frantic rush to obtain and retain information in a very short period of time. Research on test anxiety also indicates that the most effective strategy for reducing high levels of test anxiety is the use of effective learning strategies prior to the exam (Benjamin, McKeachie, Lin, & Holinger, 1981; Jones & Petruzzi, 1995; Zeidner, 1995).

**\* Maintain awareness of the type of questions that you'll be asked on the exam.**

**Recall Test Questions**

Recognition test questions ask you, "Is it this one?" Recall test questions ask you, "What is it?" Falling into the recall category are essay and short-answer questions that ask you to write your own response. As you probably already know, we can usually remember information on recognition tests more easily than we can on recall tests (Gordon, 1989) because recognition just involves picking out the correct answer; it doesn't require that we pull out (retrieve) and provide the answer on our own. For instance, we remember faces more easily than names because seeing someone's face is similar to being given a recognition test--the only thing we have to do is say, "Yes, I recognize you (your face is familiar)." However, when we try to remember the name that goes with the face, it’s like taking a recall test--now we have to come up with the name on our own, which is a more difficult memory task than simply recognizing a face that’s presented to us. You have probably heard people say, "I've got a great memory for faces, but I’m terrible with names." However, you never hear them say, "I've got a great memory for names, but I'm terrible with faces!" It's also common to hear people say, "Your face is familiar, but I can't recall your name." But, you never hear them say, "Your name is familiar, but I can't recall your face!"

Since recall test questions that require you to retrieve information and generate correct answers on your own (e.g., writing essays), they require more elaborate study strategies. Recall test questions require *you* to generate or produce the correct answer, such as short-answer questions (e.g., "Explain what happens during photosynthesis") and longer essay questions (e.g., "Trace the causes and consequences of the industrial revolution").

Recall memory can be tested in three basic ways:

1. **Paired-Associate Recall:** a single piece of information that is paired or associated with another piece of information. For example, a test question that asks you to recall the Spanish word for "head," or the capital of Alaska.

2. **Free Recall:** memory for two or more pieces of information that you're free to recall in any order or sequence. For example, a test question that asks you to, "Name the countries of South America" or, "List and describe the major causes of World War I."

3. **Serial Recall:** memory for two or more pieces of information in a specific order or sequence (series). For example, a test question that asks you to recall the names of all the vertebrae in the spinal column--in their correct order, from top to bottom.

What all three of these forms of recall memory have in common is that they require you to retrieve information on your own--a task that places greater demands on your memory than recognition. Thus, effective study strategies to use when preparing for tests that require recall memory should involve practicing retrieving the information on your own without looking at it (rather than just reading over information while it is in front of you). Research shows that practicing retrieval while studying information results in better recallmemory for that information than just looking it over or re-reading it (Bjork, 1994). Simply reviewing information when studying for a recall test is similar to a football team reading the playbook or reviewing game films prior to a game, rather than actually practicing the plays. Or, imagine if actors were to prepare for their roles in a play by just looking over their lines--without practicing dress rehearsals during which they actually retrieve and say their lines without looking at the script. Obviously, these practice strategies don't match the actual performance (test) situation, so the performance results will be much weaker. Similarly, studying for essay tests by looking over your class notes and highlighted reading will not prepare you to retrieve and recall information on your own, because it does not simulate what you’ll actually be doing on the test itself.

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Knowledge Awareness Strategies

Being aware of the type of knowledge that you'll be tested on is an important element of effective test preparation. Knowledge comes in different forms and requires different learning and memory strategies. The major forms of knowledge you will acquire in college usually fall into one of the following three key categories.

**Declarative (Semantic) Knowledge:** knowing what is accurate or true and that you can *declare* or state it in words (e.g., factual information). Acquiring this type of knowledge requires studying that involves effective use of recitation or memory-improvement strategies, such as meaningful association, acrostics, or rhythm and rhyme.

**Procedural (Skill) Knowledge:** knowing *how to do* something--which usually involves procedures or skills that have multiple steps (e.g., solving math problems, conducting science experiments). Acquiring this type of knowledge requires repeated practice or rehearsal, such as practicing delivery of a speech or lines in a play. However, this repeated practice should be reflective practice, not mindless repetition. Although repetition is needed to develop certain skills, they are often developed more deeply and more rapidly if you reflect on and remain aware of the learning and thinking *process* that you are using while practicing them.

**Episodic Knowledge:** knowing where something is *located*--i.e., its place in space. The term episodic derives from "epi" meaning "on" or "at" and "odic" meaning "path." So, literally, it refers to knowing the specific place or space where something is located in relation to other things along the same path. For example, if you are taking a course in anatomy and you are learning the location of each one of the internal organs of the body or each major part of the human brain, you are acquiring episodic knowledge. Acquiring this type of knowledge requires study strategies that make effective use of visual learning techniques, such as diagrams, concept maps, and visual imagery.

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**Seeking Feedback after Tests**

When seeking feedback for from you instructor or peers after exams, try to obtain high-quality feedback that has the following features:

\* ***Specific***--it precisely identifies what you should do to improve your performance and how you should go about doing it. For example, after a test, seek feedback from your instructors that provides you with more than just information about what your grade is, or why you lost points; instead, seek specific information about what you could do to improve your performance next time.

\* Quality feedback is ***prompt***--it comes soon after completing a task, because this is the time when you are most motivated to receive it and most likely to retain it. For example, as soon as possible after completing tests or assignments, review your performance with classmates or your professor.

\* Quality feedback is ***proactive***--it comes early in the learning process when you still have plenty of time to use it to improve your performance. For example, seek feedback from instructors early in the term, which leaves you with time to use that feedback to improve your course performance and course grade before it's too late.

**MEMORY IMPROVEMENT:**

**Strategies for Remembering What You Have Learned**

Discussion of learning typically focuses on two processes: (1) getting information into the brain (attention) and (2) keeping it there (storage or retention). The process of memory focuses heavily on the processes of *accessing and retrieving* information that has already been learned. It’s possible for someone to have acquired (stored) knowledge, but not be able to remember or recall it. Memory plays a pivotal role in academic success because if students can’t remember (access and retrieve) information that they’ve learned, they can’t build on it, communicate it, or apply higher-level thinking skills to it. It’s like having great information stored on the hard drive of your PC, but not being able to call it up, use it, or communicate it to anybody else.

Studies show that the vast majority of test questions on college exams require students to recall factual information (Milton, 1982; Milton, Pollio, & Eison, 1988). While it’s true that higher-level thinking skills are valued by college professors and future employers, achieving good grades in college still requires the basic ability to remember information. The importance of memory for success in college and beyond is well illustrated by the vast number of how-to-improve-your-memory books that can be found in the self-help section of any popular bookstore.

Key Points to Make When Covering Memory

\* Students should be reminded that brute repetition should not be automatically used as the first or default strategy for remembering information. Remembering is not synonymous with memorizing or pounding information into the brain through mindless rehearsal. Although repetition and drill is essential for certain types of memory (e.g., skill memory, such as serving a tennis ball), remembering factual and conceptual material is often better accomplished through use of memory strategies that involve active thinking, meaning making, and creating mnemonic devices. The memory-enhancement techniques discussed in this supplementary section can transform the process of remembering from a dull, repetitive task into a more stimulating cognitive experience.

\* Multiple mnemonic devices and memory-improvement strategies are offered in the supplementary material. To be sure that your students don’t “lose the forest for the trees”; remind them that all the suggested techniques boil down to using one of four key memory-promoting principles: finding meaning, creating organization, visualization, or using rhythm and rhyme.

\* Research doesn’t reinforce the belief that the vast majority of people with excellent memory are not born with an extraordinary genetic gift (e.g., photographic memory); instead, good memory is developed through the consistent use of strategic memory-strengthening methods or techniques, such as those discussed in this unit.

\* Memory is displayed or demonstrated in different forms (e.g., recall vs. recognition), and different types of test questions call for different forms of memory (e.g., essays vs. multiple-choice questions). Since not all tests are created equally, remembering information for an upcoming exam requires awareness of the type of test questions that will appear on the exam and adjusting study methods to accommodate the type of memory required by the test questions.

**Supplementary Reading or Lecture Material on Memory Improvement**

Although college courses may emphasize higher-level thinking skills, there will be numerous occasions when you’ll just be asked to recall information. Memory, like any other learning skill, can be improved by using effective strategies or techniques. Contrary to popular belief, most people with good memories don't possess some extraordinary ability, such as photographic memory. Instead, the vast majority of people with outstanding memory have successfully developed a set of effective memory strategies and practiced them diligently.

If you can learn to use memory-improvement methods effectively, you'll not only reduce the risk of forgetting information you’ve studied, you’ll also reduce the amount of study time spent on memorizing information through sheer repetition; this will open-up more time for comprehension and "higher" forms of thinking. Furthermore, using memory-improvement methods, such as those discussed in the next section, are simply more stimulating and motivating than memorization through sheer repetition.

Mnemonic Devices

Mnemonic devices, also known as mnemonics (pronounced "neh-mon-iks"), are specific memory-improvement methods designed to prevent forgetting. Mnemonic devices should not be viewed as tricks or gimmicks but as legitimate strategies that are based on one or more of the following research-based, memory-improvement principles:

l meaningful association

l organization

l visualization

l rhythm and rhyme

What all mnemonic devices have in common is that they help us remember by providing us with a *cue* that triggers recall of information learned and brings It back to mind. When humans try to retrieve memories that have been stored, studies show they usually don't remember all parts or pieces of the information in one shot; instead, they build back their memory around one or two parts that they do remember (Loftus, 1979). For instance, when college students are asked to recall stories, pictures, or geometrical designs that they have been shown to them days or weeks before, they tend to organize their recall around one or two major details--for example, they'll remember one character or episode in a story and will then try to fill in the missing details. This process of building up and bringing back a memory piece-by-piece is called *reconstruction*. Retrieval works this way because different elements of a memory are stored in different parts of the brain (Pribram, 1991). You may store the place where you saw the information in the part of our brain specialized for visual memory, the words you heard your instructor speak about it in an area of the brain specialized for auditory memory, and the printed words you read about it in an area of the brain involved with reading.

The effectiveness of mnemonics for reconstructing memory has been demonstrated in many research studies. For instance, one study showed that college students using mnemonics remembered 72 percent of words they studied, compared to an average of 28 percent for students who tried to memorize these words through mere repetition (Bower, 1973). Listed below are several mnemonic devices you could use to recall hard-to-remember information in any field of study (Buzan, 1991; Higbee, 1998; Lorayne & Lucas, 1974). These mnemonics can be adapted to remember information in different subject areas, whether it may be a single piece of information, multiple ideas, or a sequence of steps in a procedure. Some of these mnemonics may work more effectively on certain types of information than others, but the variety should give you a menu to choose from, allowing you to select different ones for different learning tasks or situations. (For additional mnemonics specifically designed for remembering information in particular academic subjects, see: [www.eudesign.com](http://www.eudesign.com); to find mnemonics specifically for medical and health-related fields, see: [www.medicalmnemonics.com](http://www.medicalmnemonics.com))

Pause for Reflection

Have you ever created a mnemonic of your own for information that you were studying and trying to remember?

If yes, what was it?

If no, why do you think that you haven't?

Meaningful Association

Relating what you’re trying to remember to something you already know can be a powerful memory aid because learning is all about making connections in the brain. Thus, the first and most effective way to improve memory is to find *meaning* in what you’re trying to remember. Before starting to repeatedly pound it into your head like a hammer and nail, first look for a hook to hang it on--by relating it to something already stored in your brain. It may take a little while to discover the right hook, but once you’ve found it, the information will store in your brain quickly and remain there for a long period of time. For example, you can use a meaningful association to remember how to correctly spell one of the most frequently misspelled words in the English language, *separate* (very commonly misspelled as "seperate"), by remembering that “par” means to divide or break into parts, as in the words *par*ts, *par*tition, and se*par*ate.

"The extent to which we remember a new experience has more to do with how it relates to existing memories than with how many

times or how recently we have experienced it."

 --Morton Hunt, *The Universe Within: A New Science Explores the Human Mind*

Personal Experience

Some time ago, I had to give up running because of damage to my right hip, so I decided to start riding a stationary bike instead. My wife found an inexpensive, used stationary bike at a garage sale. It was an old and somewhat rusty bike that made a noise when I rode it that sounded like "ee-zoh" over and over again as the wheel spun. One evening I was riding it and I noticed that, after about 10 minutes, I was hearing the words "zero," "rosy," and "Rio" off and on in my head. Now that I think about it, what my brain was doing was taking a meaningless sound ("ee-zoh"), which apparently it grew bored of hearing over and over again as the wheels spun, and transformed that sound into actual words that provided it with variety and meaning. This might have been a classic example of how meaningful association is an effective mnemonic device, and how the human brain naturally seeks meaning in favor of mindless repetition.

--Joe Cuseo

There are many everyday examples of how effective meaningful associations can be for improving memory. Here are some of the most well-known uses of meaningful association as a mnemonic device to recall information accurately.

l Remembering to turn the clock one hour ahead in the spring and one hour back in the fall by associating it with: "Spring forward, fall back."

l Remembering how to spell the word "principal" (as opposed to principle) by associating it with the idea that a principal should be a "pal."

l Remembering Italy's geographic location at the bottom of Europe because it's shaped like a boot.

l Remembering dates; for example, remembering that the Magna Carta (a key historical document that led to constitutional laws designed to protect personal freedoms and rights) was written in the year 1215--by associating it with a "free lunch" given at lunchtime (12:15 p.m.).

Personal Experience

I bought a new car and it had a feature that no other car I drove ever had. In every previous car I drove, if you needed to turn on the windshield wipers on, you either pressed a button or pulled a lever toward you (to turn on the wipers) and push it away from you (to turn off the wipers). In this new car, no buttons were involved or pull-push lever system was involved. Instead, the windshield wipers worked by requiring to push a lever down (like you were shifting a gear) to turn on the wipers and pushing the lever up to turn the wipers off. After driving the car for almost three months, I still kept forgetting what direction to shift the lever whenever it was raining. Because my motor (muscle) memory kept failing me, I figured that I had to come up with some sort of mnemonic device to help me make sense of the wiper system and remember how to use it. I finally came up with a meaningful association for remembering how to do it: "If rain's coming down, pull it down; if the rain let's up, push it up." That made perfect sense to me and my memory for the wiper system has been perfect ever since.

--Joe Cuseo

**Pause for Reflection**

Think of some important information that you'll need to remember this term.

What's the information you’re attempting to learn?

What's a meaningful association that you could use to help you remember it?

Student Perspective

“I like to associate what I have to remember with something that I already know or care about.”

First-year student’s response to the question: "When you need to remember information, what strategy works best for you?"

Organization: Remembering by Classifying or Categorizing

Bits or pieces of information are more easily learned and better remembered if they are organized into categories. Studies show that if students study a list of words that fall into different categories (e.g., 12 grocery items that fall into categories like fruit or meat), their recall is much better than when they study 12 unrelated words that can't be grouped In any way (Mandler, 1967).

The memory advantage for categorized information is even greater if the items that belong to the same category are grouped or clustered together in blocked form (Bower et al., 1969). For instance, it's easier to remember "10-10-987" than it is to remember "1-0-1-0-9-8-7."

Thus, memory can often be improved by simply organizing separate pieces of information into categories and sub-categories. Index cards are a good tool for such purposes; you can use the cards as mini-files for separate categories of information, and when you bundled the cards together, you've got yourself a miniature (and portable) file cabinet. Try to create categories of no more than six items because research suggests that we can hold up to about six items in our working memory, (Cowan, 2001). If you end up with a category that contains more than six items, try to subdivide it into two smaller subcategories.

Studies show that the memory-improvement power of organization is so strong that when college students are instructed simply to organize pieces of information, they tend to remember that information equally well as students who are explicitly instructed to study or memorize the same information (Mandler, 1967; Kintsch, 1982). Although it may take a little extra time to organize the information at first, it saves study time in the long run because the information is actually being learned while it’s being organized. Furthermore, once the information has been organized, it's much less time-consuming to review at a later date because you’ve got all the parts together in a file system. In fact, if you organized the information on index cards, with each index card representing a separate category of information, you could put a rubber band around the cards and carry them with you to review at any time or any place. This not only makes studying more convenient, it also tends to reduce your level of test anxiety because you’ve "got it altogether" in a neat package, which is a lot more comforting than having it all over the place.

Personal Experience

Whenever I meet a new class of students at the start of the term, the first thing I try to do is learn their names as quickly as possible. I have found that I can learn student names more rapidly if I don't study names individually, but group them into certain categories. I first divide the names by gender, putting all the male and female students into separate groups. Then I subdivide the male and female names into two subgroups: American student names and international student names. Thus, I end up with four groups: (1) American male students, (2) American female students, (3) international male students, and (4) international female students. I have found that I can remember student names faster when I group them into these categories than by trying to study them one name at a time.

Joe Cuseo

Visualization

Visualization may be used as a mnemonic device for improving memory in the following ways:

l visualizing a mental *image* or *picture* of the information you want to remember, or

l visualizing the information you're trying to remember in a familiar *place* or *location*.

Student Perspective

"I use anything visual--usually drawings or pictures--anything visual!"

First-year student’s response to the question: "When you need to remember information, what strategy works best for you?"

Visualizing strengthens memory by transforming an abstract idea into something more tangible form that you can “see” in a concrete place or physical space Have you ever had the experience of remembering the place on a page where a certain piece of information was located (e.g., upper-right-hand corner) which then triggered your memory of the information you were trying to recall? This example points to the important role that space and place can play in improving our memory. Studies also show that learning to recall visual images takes less repetition or practice time than words and sentences (Buzan, 1991; Roediger & McDermott, 2000). Also, visual images can be created in a way that multiple pieces of information are contained in it; thus, when the image is recalled, the various pieces of information included in are recalled at the same time (Nadel & Welmer, 1980).

The power of visual memory may stem from the fact that it's the oldest form of human memory. Before humans became literate and began using words to speak and later to write, our early ancestors relied exclusively visual memory of objects, places, and directions to ensure their survival. The ability to visualize was critical to the early evolutions of humans because it enabled them to recall places where food and shelter were located, and were predators could be avoided (Milner & Goodale, 1998). Since the human brain may be biologically "hard wired" for visual memory, visualization can be an especially powerful memory-improvement technique.

You can use *visual imagery* as a mnemonic device by imagining visual scenes depicting the information you want to remember. This is illustrated by the common strategy for remembering that the mathematical symbol ">" means "greater than" by imagining it as a mouth taking a bite out of something smaller. Studies show that when students are asked to associate two words (e.g., "cow" and "ball"), they display better memory for the associated words if they visually imagine the two words interacting in some way (e.g., the cow chasing the ball). In learning foreign languages, it's been found that visual imagery improves learning word translations. For example, one student effectively learned and remembered the Spanish word caballo (pronounced "cab-eye-oh"), which means "horse," by associating it with a visual image of a horse with a huge eye (Atkinson, 1975). Visual images that are vivid, outrageous, intensely emotional, hilarious, or action-packed make the best mnemonic devices (Bower, 1972; Carney & Levin, 2001).

Another way to capitalize on the memory-improving power of visualization and organization is to create *concept maps*, which organizes all the pieces of information you’re trying to remember into a visual map. Figure 5.7 on p. 128 of the text represents a concept map that could be used to remember the parts and functions of the human nervous system. Creating concept maps help improve your memory by enabling you to become actively involved with the material you’re trying to remember and by providing you with a visual picture of that information.

**Pause for Reflection**

Think of a course you’re taking this term in which you’re learning related pieces of information that could be joined together to form a concept map. Below, make a rough sketch of this map that includes the information you need to remember.

Rhythm and Rhyme

This mnemonic device involves creating a short poem, song, or jinglethat ties together the pieces of information you’re trying to remember. Studies show that if information is arranged in a rhythmical-rhyming pattern, it's better remembered (Higbee, 1998). You may have had the experience of hearing a song or melody that you hadn’t heard in years, but as soon as you hear the melody, the song lyrics immediately come back to mind.

Well-known examples of using rhythm and rhyme to improve memory, such as the following:

l Remembering the letters of the alphabet by singing the alphabet song--"A, B, C, D, E, F, G, . . . H, I, J, K, L, M, N, O, P," etc.

l Remembering the correct number of days in each month--"Thirty days hath September, April, June, and November," etc.

l Remembering spelling rules--for example, "i" before "e" except after "c" or when sounded like "a" as in "neighbor" and "weigh."

l Remembering directions--for example, when using a screwdriver: "left-loose, right-tight" or, the more rhythmic: "lefty-loosey, righty-tighty."

l Remembering dates--for example, "In fourteen hundred and ninety-two, Columbus sailed the ocean blue."

There are many other examples that could be added to this list, which suggests that rhythm and rhyme can be applied to almost any information you’re trying to remember. Be on the lookout for how you could use this powerful mnemonic to remember course information by converting that information into a short poem or jingle.

Personal Experience

In 1993, there was a famous murder trial involving a sports celebrity in southern California. Much of the trial, including witness testimony and lawyer arguments, was covered live on national television. Today, the only thing I still remember about that trial was a poetic line used by the defense lawyer that he used to make the case that the bloody glove found near the scene of the crime didn't fit the hand of the defendant. His words were: "If the glove does not fit, you must acquit." I think that my long-term memory of this one sentence serves as clear testimony to the memory-promoting power of rhythm and rhyme.

Joe Cuseo

Acrostics

An *acrostic* is a mnemonic device that involves lining up the first letter of each item you’re trying to remember in an order that creates a word (acronym), phrase, or sentence. (The word "acrostic" stems from the same root as the words "order" and "line."

Some of the most well-known acrostics are the following:

l "HOMES"--to remember the names of the Great Lakes: Huron, Ontario, Michigan, Erie, and Superior;

l "Roy G Biv"--to remember the colors of the visual spectrum: Red, Orange, Yellow, Green, Blue, Indigo, and Violet;

l "Every Good Boy Does Fine"--to remember the notes on the musical scale's treble clef: E-G-B-D-F;

l FOIL--to remember how to multiply algebraic expressions--First Outer, Inner Last.

You can create an acrostic for any information studying that has multiple parts or pieces. For instance, to remember five major ways In which you can determine whether you're really you're learning something at a deeper level than memorization, the word "IRATE" could serve as an acrostic:

I = Illustrate (give an example of it),

R = Represent (represent it in a different form, such as an analogy or metaphor),

A = Apply (apply it to solve a problem or to something you already know),

T = Translate (transform it into your own words), and

E = Explain (explain it to a friend).

Personal Experience

I once had trouble remembering the names of the planets in their correct order of distance from the sun, so I developed the following acrostic almost 25 years ago, and I’ve never forgotten it. "Men Very Easily Make Jugs Serving Useful Nighttime Pleasures"--to remember: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto. After I shared this mnemonic in class, one student raised her hand and shared the following acrostic that she used to remember the classification system of living species in her Biology course: "Kings Play Chess on Fat Girls' Stomachs"--to remember: Kingdom, Phylum, Class, Family, Genus, and Species.

Joe Cuseo

Acrostics are especially effective for remembering multiple pieces of information in their correct order or sequence. A good strategy for creating acrostics is to list the first letters of all the items you’re trying to remember and rearrange their order until you come up with a sequence that spells out a meaningful word, just as you would rearrange the letters in a "word jumbles" that are found in newspapers. Be creative; it may take a while, but once you’ve found one, it’s likely to be an effective way to store information in long-term memory that can help you prepare for exams. On exams, write down your acrostics as soon as you receive the test so that you're less likely to forget them; then refer to them during the exam.

**Pause for Reflection**

Take a few moments and try to create an acrostic (word, phrase, or sentence) to serve as a mnemonic device for remembering the four key memory-improvement strategies that we’ve discussed thus far, namely: (1) meaningful association, (2) organization, (3) visualization, and (4) rhythm and rhyme.

You can use the questions below to guide your development of mnemonic devices.

……………………………………………………………………………………………………………………..

Key Questions to Guide Creation of Your Own Mnemonic Devices

1. Can you relate or associate what you’re trying to remember with something you already know, or can you create a short meaningful story out of it? (Meaningful Association)

2. Can you remember it by visualizing an image of it, or by visually associating the pieces of information you want to recall with familiar places or sites? (Visualization)

3. Can you represent each piece of information you’re trying to recall as a letter and string the letters together to form a word, phrase, or short sentence? (Acrostic)

4. Can you rhyme what you’re trying to remember with a word or expression you know well, or can you create a little poem, jingle, or melody out of it that contains the information? (Rhythm and Rhyme)

**Formal Mnemonic Systems**

In addition to simple mnemonic devices that you can create on your own, there are formal mnemonic systems that have been developed by memory-Improvement experts. Two of the most popular mnemonic systems, the link system and loci system, are discussed below.

**Link System**

This mnemonic device uses meaningful associations to create a *story* containing the pieces of information that need to be remembered in a set order or sequence. It consists of two basic steps:

1. Make a list of the items you want to remember, arranging them in the order that you want to recall them.

2. Make an association between each successive pair of items on the list--that is, between the first and second items, then the second and third items, then the third and fourth items.

In other words, you associate two items at a time--linking each pair of items together until you form a complete association chain, which links all the items into one logically sequenced story.

For instance, suppose your biology course requires you to remember the following taxonomy of living organisms: (1) Kingdom, (2) Phylum, (3) Class, (4) Order, (5) Family, (6) Genus, and (7) Species. You might use the link system to weave all seven of these classifications into a meaningful story sequence, such as the following: "A mad ruler wanted to take over the world and create his own intelligent kingdom, so he decided to take his people and file 'em (phylum) into different classes of intelligence. He then delivered an order requiring that only members of the brightest groups be allowed to marry and have a family because they would be more likely to have genius (genus) children, which would improve the intelligence of the human species."

By linking all seven items into a short story such as this, seven unrelated bits of information are organized into one meaningful chunk. Thus, the link or chain system capitalizes on the power of the brain-based learning principles of organization and meaningfulness to improve memory.

You can also use the link system to help you remember parts of a speech you’re planning to deliver, or the parts to a long essay answer you’re preparing. You can do this by picking out a key phrase or catchword to represent the major point of each section of your speech or essay, and then devise a link between each of these catchwords, connecting them in the order in which you want to recall them. Thus, successive catchwords serve as memory cues to help you recall the successive pieces of information in their correct order or sequence.

**Loci System**

"Loci" means place or location. This mnemonic system involves thinking of a natural sequence of places or locations along a path that you regularly travel and visually associating the items of information you’re trying to remember at each of these sites. More specifically, this method consists of the following three steps:

1. Take a familiar location you pass through quite often and note the natural sequence of various sites (loci) you see along the way. For example, the location could be your home and the typical sequence of sites might be: the flowers in your front yard, the concrete front steps, the oak front door, a narrow hallway, the numbered door leading to your room or apartment, etc.

2. Associate each of the items you want to remember with one of the sites along your route--in the order that you want to recall them. Associate the first item to be remembered with the first site on the route, the second item to be remembered with the second site, etc.

3. When you want to recall all the items in their proper sequence, just take an imaginary walk along your route, using each site as a cue to recall the item you associated with it.

This memory strategy was discovered and used by famous Greek and Roman orators who delivered their speeches as they walked through their mansions, using each successive room as a visual cue to remember each successive part of their long speeches (Lofus, 1980). One current carry-over from this old tradition is the expression, "in the first place," which we tend to say when we're about to make a number of different points.

If you were to use the loci system to remember the Ten Commandments, you would visually associate each of the commandments with each successive site along your familiar route. To briefly illustrate: For the first commandment, you could visualize a statue of a pagan god sitting in your front yard (commandment #1: Thou shalt have no other gods before me). For the second commandment, you might imagine a door-to-door salesman standing on your front steps cursing because your mother has just rejected his attempt to sell her a new cleaning agent (commandment #2: Thou shalt not take the name of the Lord in vain), etc.

The loci system can be used to remember anything that comes in a series or sequence, such as:

\* lists of information (e.g., Bill of Rights) or amendments to the Constitution,

\* parts of a speech (letting each site stand for each section of your speech), or

\* major sections of your answer to an essay question.

It's recommended that you visualize the images you want to remember as if you were seeing them with your own eyes, rather than watching yourself walking through the rooms as if you were a spectator. Also, as you go from place to place, try to feel the actual sensations you get from moving, because this will add a kinesthetic memory trace to your visual memory trace. Studies show that when people not only visualize a movement, but also imagine making the movement, it enhances their performance (Garfield, 1984). This technique is referred to as visual-motor behavior rehearsal (VMBR), and athletes have used it successfully to improve their recall of motor (muscle) memories (Suinn, 1985).

**Possible Exercises/Assignments Related to Memory & Memory Improvement**

***Mnemonic-Device Corners***

 This practice should serve to demonstrate to students the power of mnemonic devices, as well as how their production can stimulate creative thinking.

Steps:

1. Ask students to choose one corner of the room based on whether they think they’re best at

 creating mnemonic devices that involve: (a) visualization, (b) organization (e.g., acrostics), (c)

 rhythm-and rhyme, or (d) a meaningful story.

2. Have students form 3- or 4-member teams in their corner of the room, and ask them to create a

 mnemonic device for remembering some material that you present to them. (What works best

 is material that contains about 5-7 separate pieces or “bits” of information—e.g., the seven

 habits of highly effective people, or the seven deadly sins.)

3. Have one student on each team rotate clockwise to an adjacent team and share the mnemonic

 device created by her “home team.” Continue this rotation until the rotating student returns

 back to her home team.

4. At the beginning of the next class period, ask the class if they can recall the material for which

 they created a mnemonic device in the previous class.

**TEST-TAKING STATEGIES**

Reducing Test Anxiety

To minimize test anxiety, consider the following practices and strategies.

**1. Avoid cramming for exams.** There is evidence that college students who display greater amounts of procrastination experience higher levels of test anxiety (Rothblum, Solomon, & Murakami, 1986). High levels of pre-test tension associated with rushing and late-night cramming are likely to carry over to the test itself, resulting in higher levels of test-taking tension. Furthermore, loss of sleep caused by previous-night cramming is likely to decrease your amount of dream (REM) sleep, which in turn, is likely to increase the level of anxiety you experience the following day (test day).

2. Be well prepared for exams. Test-anxiety research indicates that college students who are well prepared for exams not only achieve higher test scores; they experience lower test anxiety (Zohar, 1998). Studies also show that one of the best ways to reduce high levels of test anxiety is by using effective study strategies prior to the exam (Benjamin, McKeachie, Lin, & Holinger, 1981; Jones & Petruzzi, 1995; Zeidner, 1995), such as those discussed pp. 120-132.

**3. During the exam, concentrate on the here and now**. Devote your attention fully to answering the test question that you’re currently working on; don't focus on the future (e.g., what your eventual test grade).

**4. Stay focused on the test in front of you, not the students around you.** Don't spend valuable test time looking at what others are doing and wondering whether they're doing better than you are. If you came to the test well prepared and are still finding the test difficult, it's very likely that other students are finding it difficult too. If you happen to notice that other students are finishing before you do, don’t assume they breezed through the test or that they’re smarter than you. Their faster finish may simply reflect the fact that they didn’t know many of the answers and decided to give up and get out, rather than prolong the agony.

**5. Don't spend a lot of time focusing on the amount of time left in the exam.** Repeatedly checking the clock during the test can distract your thought process and increase your stress level; check the time only periodically--e.g., after you finish different sections of the test. Do your time checking after you’ve completed test questions, rather than during your answers and interrupting your train of thought. (You might also consider taking off your wristwatch or taking out your cell phone and laying it on your desk during the test, so you can check the time more easily during the exam.)

**6. Control your thoughts--focus on thinking positively and showing what you know, rather than worrying about what answers you don’t know and how many points you've lost.** Thoughts can influence emotions (Ellis, 1995) and positive emotions, such as those associated with optimism and a sense of accomplishment, can improve mental performance by enhancing the brain’s ability to process, store, and retrieve information (Rosenfield, 1988). Also, keep in mind that college exams are often designed to be more difficult than high school tests, so it’s less likely that students will get 90 to 100 percent of the total points. Remember that you can achieve good grades on college exams without having to achieve near-perfect test scores.

**7**. **Remember that if you're experiencing a *moderate* amount of stress during the exam, this isn't abnormal or an indication that you're suffering from test anxiety**. If you're experiencing moderate levels of tension, this is a sign that you're motivated and want to do well. In fact, research shows that experiencing *moderate* levels of tension during tests and other performance-evaluation situations serves to maximize alertness, concentration, and memory (Sapolsky, 2004).

**8. Keep in mind that it's just a test, not a measure of your ability or character.** The exam is not measuringyour overall intelligence or your overall academic ability, and the grade you receive is not a label that brands your quality as a student or as a person. In fact, a low test-grade may not reflect lack of effort or ability on your part; instead it may reflect the complexity of the course material or the complexity of the test itself.

The Multiple Purposes & Power of Writing

The power of writing is highlighted in interviews with graduating seniors who were asked the following question: “Think of all the courses you have taken at college. Which course, or courses, had the most profound impact on you, on the way you think, about learning, about life, about the world?” When seniors answered this question, they tended to cite courses in which they had done a significant amount of writing (Light, 2001).

Your ability to write clearly, concisely, creatively, and persuasively will not only enable you to succeed academically; it will also promote your professional success. In one study, ten years after they graduation, college alumni were asked about the importance of different skills for their current work responsibilities and over 90 percent of the alumni ranked “need to write effectively” as a skill they considered to be of “great importance” to their current work (Worth, cited in Light, 2001). Surveys reveal that working professionals spend anywhere from 4 to 16 hours of their work week on writing activities alone, such as writing reports, memos, and letters (Anderson, 1985). In fact, the first contact and first impression you'll make on future employers is likely to be your letter of application or cover letter you write when applying for positions. Constructing a well-written letter of application may be your first step toward converting your college experience and college degree into a successful career.

**Remember:** Writing skills will contribute to your academic success across all subject areas throughout all years in college, and these same skills will promote your professional success in any career you may pursue beyond college.

Types of Writing

The types of written products that you can produce other than the traditional formal essay, research report, or term paper, include a host of shorter and more informal types of writing. Writing scholars have classified different forms of writing into two major classes or categories: (a) *transactional* writing and (b) *expressive* or informal writing (Britton, et al., 1976; Connolly, 1989; Tchudi, 1986). These two major types of writing are defined and illustrated below.

1.***Transactional* Writing**: public writing that is primarily intended for others to read and is most commonly used for the purposes of communicating, informing, reporting, explaining, persuading, or entertaining. This type of writing includes written products such as:

\* *Letters*--such as writing a letter to a newspaper editor, an elected official, student body president, or college administrator--to offer persuasive suggestions for improving the college experience on your campus.

\* *Manuals or “How to” Guides*, such as writing a college-success guide for beginning college students.

\* *Editorials or Feature Articles*, such as writing editorials or articles for your college newspaper.

\* *Critical Reviews*, such as writing reviews of books, films, plays, musical performances, or TV programs.

\* *Creative Writing*, such as writing poems, fictional stories, science fiction, and scripts for plays, movies, or videos.

2. **Expressive or Informal Writing**: personal writing that is intended for the writer and is used for the purpose promoting self-awareness and personal growth. This category would include written products such as:

\* *Diaries*

For example, keeping a diary of autobiographical entries that includes key past experiences and future plans.

\* *Journals*

 A journal may be defined as an ongoing series of written reactions to or reflections on personal experiences that take place over an extended period of time. In a journal, since your written entries are made over an extended period of time, you are left with a historical record of your thoughts and feelings. This record can be checked to detect patterns of consistency or change, which may give you a window of self-insight through which you can see how you are developing academically and personally. For example, you can keep a “career-exploration journal,” in which, you could record your reflections on the results of career tests and self-assessments. Your may also include in this journal any self-insights or self-discoveries you've made about your career interests, values, and abilities after experiencing different college courses subjects or from your experiences outside the classroom, such as co-curricular activities, volunteer service, and part-time employment.

 You can also use journals as a personal incentive to stimulate and motivate your use of effective learning strategies, such as keeping weekly journals in which you note how you have applied effective learning strategies that have been discussed in the textbook. In fact, it's more likely that you'll actually use learning strategies if you know that you're going to keep track of them.)

\* *Lists or Memos to Self*

 For example, you can develop the habit of listing specific advantages and disadvantages associated with difficult personal choices, along with their relative weights (strong or weak), in order to help you make important decisions in an informed and balanced way.

\* *Checklists*

 A checklist may be defined as an inventory or itemized list of all key elements or steps involved in a task, which allows you to check (and double-check) whether you've overlooked any of them. For example, the checklist of steps for college success presented in Chapter 1 (pp. 29–30) can serve this purpose (pp. 23-24). Similarly, you can write a checklist for any academic task you're asked to perform in college to ensure that you've covered all the bases (e.g., creating a checklist of criteria or factors that your instructor will use to grade your performance on a major assignment).

\* Logs

 A log may be defined as a written record of personal habits or behaviors that includes specific information about *when and where* they took place. For instance, you could keep a log of how you spend your time or your money.

**Pause for Reflection**

Do you do any writing other than that which is assigned to you in your classes?

If yes, what are the other types of writing you do and what purposes do they serve?

**Writing for Different Academic Tasks and Purposes**

*Writing-to-learn* activities can be used for a wide variety of academic purposes and tasks in college, such as those listed below. As you read the following list of different writing activities and purposes, make a short note in the margin that indicates whether you do this type of writing. If you don’t do it, e note whether you think it would be worth doing.

1. Writing to Listen

Writing can be used to ensure that you're an active listener and maintain attention and concentration on what's being said during lectures, study-group sessions, and office visits with your instructors.

You could write a “one-minute paper” immediately after each class session, which only takes a minute or less to complete, but enables you to assess whether you’ve actively listened to and grasped the most important message delivered in class that day. For example, you can write a response to the following self-posed questions: “What was the most significant concept I learned in class today?” or, “What was the most confusing thing that I experienced in today’s class that I should ask my instructor to clarify?”

2. Writing to Read

Just as writing can promote active listening, it can promote active reading. Taking notes on *what* you’re reading while you’re reading implements the effective learning principle of active involvement because it requires more mental and physical energy than merely reading and highlighting sentences.

 “I would advise you to read with a pen in your hand, and enter in a little book of short hints of what you find that is curious, or

 that might be useful; for this will be the best method of imprinting such particulars in your memory, where they will be

 ready.”

 --Benjamin Franklin, eighteenth-century inventor, politician, and co-signer of the *Declaration of Independence*

3. Writing to Remember

Writing lists or memos to yourself, such as ideas generated at a group meeting, or lists of definitions, terms, and key concepts that you need to remember, is an old-fashioned but sure-fire way not to forget them. When you’ve recorded an idea in print, you have created a permanent record of it that will enable you to review it at any time. Furthermore, the act of writing itself creates “motor (muscle) memory” that's associated with the information you're writing, which helps you retain and recall that information. Writing also improves memory by allowing you to *see* the information, which registers it in your brain as a visual memory trace.

Personal Story

Whenever I have trouble remembering the spelling of a word, I take a pen or pencil and start to write the word out. I’m surprised at how many times the correct spelling comes back to my mind once I begin to write the word. The more I think about this, it’s not surprising that my memory the spelling immediately returns when I start writing it. This memory “flashback” is probably due to the fact that when I start using the muscles in my hand to write the word, it activates the “muscle memories” in my brain that were previously formed when I wrote the word correctly.

—Joe Cuseo

4. Writing to Organize

Constructing summaries and outlines, or writing ideas on different index cards that relate to the same category or concept, are effective ways of organizing information. This type of organizational writing helps you to learn because it requires synthesis of different ideas and restatement of ideas in your own words, both of which are effective learning strategies. Studies show that the memory-improvement power of organization is so strong that when college students are instructed simply to organize pieces of information, they tend to remember that information equally well as students who are instructed to study or memorize the same information.

5. Writing to Study

Writing study guides or practice answers to potential test questions is an effective study strategy that can be used when learning alone or when preparing for study groups. This is particularly effective preparation for essay tests because it enables you to study in a way that closely matches what you will be expected to do on an essay test--which is to write.

6. Writing to Understand

Paraphrasing or restating what you’re trying to learn by writing it in your own words is an effective way to give yourself feedback about whether you’ve truly understood it, rather than memorized it, because it forces you to transform what you're learning into words that are meaningful to you.

"I write to understand as much as to be understood."

—Elie Wiesel, world-famous American novelist, Nobel Prize winner, and Holocaust survivor

Since writing requires physical action, it also implements the effective learning principle of active involvement; it essentially forces you to focus attention on your own thoughts and activate your thinking, and also by slowing it down, allowing it to think in a more careful, systematic fashion that makes you more consciously aware of specific details. Lastly, the act of writing results in a visible product you can review and use as feedback to improve the quality of your thoughts (Applebee, 1984; Langer & Applebee, 1987). In other words, writing allows you to “think out loud on paper” (Bean, 2003, p 102).

"How can I know what I think ‘til I see what I say?"

—Graham Wallas, *The Art of Thought*, 1926

7. Writing to Discuss

Prior to participating in class or group discussions, you can gather your thoughts in writing before expressing them orally. This will ensure that you’ve carefully reflected on your ideas, which, in turn, should improve the quality of the ideas you express during class discussions. Gathering your thoughts in writing before speaking is also a strategy that should also make you a less anxious, more confident speaker because you'll know what you're going to say before you start saying it. Your written notes give you a script to build on—and to fall back on—in case you experience speech anxiety or memory block while expressing your ideas.

**8. Writing for Creativity**

Writing can also stimulate your discovery of new ideas because new ideas often emerge *during* the act or process of writing). As the poet William Stafford puts it, “A writer is not so much someone who has something to say as he is someone who has found a process that will bring about new things he would not have thought of if he had not started to say [write] them” (quoted in Connolly, 1989, p. 3). Viewed from this perspective, writing is not just the end result or final product of your thinking; it's also a means or process for stimulating your thinking.

"There is in writing the constant joy of sudden discovery, of happy accident."

—H. L. Mencken, twentieth-century American journalist and social critic

You can generate creative ideas through the process of *free-writing*, whereby you quickly jot down free-floating thoughts on paper, without worrying about spelling and grammar. Free-writing can be used as a warm-up exercise to help you generate ideas for a research topic, to keep track of original ideas you may happen to discover while brainstorming, or to jot down creative ideas that suddenly pop into your mind at unexpected times--before they slip your mind).

"There are some kinds of writing that you have to do very fast, like riding a bicycle on a tightrope."

—William Faulkner, Nobel Prize-winning author

**9. Writing for Problem Solving**

Writing can be used to track the thought process and sequence you use while solving problems in math and science. By writing down the thoughts that are going through your mind at each major step in the problem-solving process, you increase awareness of how your thinking is progressing and you’re left with a written record of your train of thought. You can later review this written record of thinking steps to help you retrieve the path of thought used to solve the problem successfully so that you may use the same path again to solve similar problems in the future.

Try to get into the habit of periodically stepping back toreflect on your thinking process. Ask yourself what type of thinking you are doing (such as analysis, synthesis, evaluation) and record your personal reflections in writing. You could also keep a “thinking log” or “thinking journal” to increase self-awareness of the thinking strategies you develop across time, or how your thinking strategies may vary across different courses and academic fields.

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**Remember:** Writing is not only a method of communicating with others; it is also a means for promoting your own learning and thinking.

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All of the previously mentioned writing-to-learn strategies can be done *collaboratively* with a peer. The benefits of writing-to-learn activities are likely to be magnified if you pair-up and do them as a duet, or by teaming-up with two or three other students and doing them as a trio or quartet.

**Pause for Reflection**

Have you ever teamed up with a classmate to complete a writing assignment?

If yes, did you think it was effective?

If no, why do you think you've never done so?

**Reading and Editing Your Own Writing**

When reading your paper, you can use the following criteria to critically evaluate each of the following features:

**Higher-Level Thinking**

 Does your paper demonstrate different forms of higher-level thinking? (See p. 167, Box 7.1) For instance, are its major points and final conclusion well supported by evidence*—*such as:

\* direct quotes from authoritative sources,

\* specific examples,

\* statistical data,

\* scientific research findings, or

\* first-hand experiences?

 **Overall Organization**

 Take a *panoramic* or aerial view of your paper to see if you can clearly identify its three major parts: its beginning (introduction), middle (body), and end (conclusion). Do these three parts unite to form a connected whole? If not, try rearranging their order.

 If the paper’s key sections seem difficult to identify or distinguish, try highlighting them with headings that are underlined, capitalized, or boldfaced; this may make it clearer to the reader where different sections begin and end. Also, check to see if there is *continuity* between one paragraph to the next throughout your paper:Does your train of thought stay on track across paragraphs--from start to finish? If you find yourself getting off track at certain points in your paper, eliminate that information or rewrite it in a way that re-routes your thoughts back onto its main track (your thesis statement).

**Sentence Structure**

 Do the sentences within each paragraph make sense and flow smoothly from one to another? Check for:

 \* Sentences that are *too long*—rambling sentences that go on and on without any punctuation

 or pauses that allow readers to catch their breath. You can correct rambling sentences by:

 a) punctuating them with a comma—signaling a short pause,

 b) punctuating them with a semi-colon—signaling a longer pause than a comma (but not

 as long as a period), or

 c) dividing them into two shorter sentences (separated by a period).

 \* Sentences that are *too short*—choppy sentences that “chop up” what you’ve written into such

 short segments that they interfere with the natural flow or rhythm of reading. Correct choppy

 sentences by joining them to form a larger sentence, punctuated by a comma or semicolon.

 One strategy for helping you determine whether your written sentences flow smoothly is to read them aloud. Reading your writing out loud can help you find run-on sentences and choppy sentences. Note the places where you naturally tend to pause and where you tend to keep going. Your natural pauses may serve as cues for places where your sentences need punctuation; your natural runs may indicate sentences that are flowing smoothly and should be left alone.

**Remember:** Your writing style should not obscure or obstruct the thoughts you intend to send from your mind to the reader’s mind; instead, your writing should function as a smooth-running vehicle that “drives home” your thoughts efficiently and powerfully.

**Word Selection**

 Are certain words or phrases showing up so frequently in your paper that they sound *repetitious*? If so, try to vary your vocabulary by substituting words that have the same or similar meaning. This substitution process can be made easier by using a thesaurus, which may be conveniently available on your computer’s word processing program.

**Seeking Feedback from Other Readers**

You're always the first reader of your paper, but you don’t have to be the only reader before it's submitted to your instructor for a grade. Sometimes, no matter how honest or objective we try to be about our own work, we may still be blind to its weaknesses. All of us may have a natural tendency to see what we hope or want to see in our work, rather than what’s really there—especially after we’ve put a great deal of time, effort, and energy into the process of creating it. So, get a second opinion on your paper by asking a trusted friend or a tutor in the Writing or Learning Center to read it.

Student Perspective

“There are countless ways in which an individual can avoid academic dishonesty. An excellent idea is going to a tutor or professor to have the paper read [before turning it in].”

—First-year student reflection on a plagiarism violation

You can seek feedback at any stageof the writing process—whether it be for help with understanding the assignment, brainstorming ideas for topics, writing your first draft, or writing your final draft. The Writing or Learning Center is not limited to students experiencing writing problems or writer’s block. Help may be sought by all students who want to push the quality of their writing to a higher level. Even if you consider yourself to be a good writer, your writing can get even better by seeking and receiving feedback from others before submitting your final product. Consider pairing up with a partner to exchange papers and evaluate each other’s work, using the same criteria that your instructor will use to grade it.

Student Perspective

“Students can avoid plagiarism by getting help from someone who knows how to cite correctly. I know now that I have my citations

 double-checked.”

 —First-year student reflection on a plagiarism violation

**Peer Writing Groups**

Studies show that when students with different levels of writing ability receive feedback from others prior to submitting a paper, it improves the overall quality of their writing as well as the grades they receive on writing assignments (Dudenhyer, 1976; Thompson, 1981). Just as you form study groups, you can form writing groups, and set them up for different stages of the writing process. Scheduling regular meeting times should also provide social support and help group members to stay on schedule and meet writing deadline.

Since writing and speaking both involve communicating with words, the same benefits that students experience from participating in small-group discussions and study groups can be experienced when they participate in writing groups (Bruffee, 1993). Your peers can provide you with a unique source of feedback because they represent a live audience of readers who speak the same language as you do. Because writing is something we usually do alone and without any social support, we do not receive the immediate response or reaction to our words like we do when we’re speaking to others. Forming writing groups with your peers can provide you with feedback on your writing as we well as make the process of writing more comfortable and motivating (Elbow, 1973). Furthermore, writing groups not only help the writer who receives feedback from peers, it also benefits students who read and provide feedback because it helps them to evaluate and edit their ownwriting more effectively (Gere, 1987).

Research reveals that when individual students interact with their peers during the writing process, they tend to show higher levels of involvement and commitment to writing (Hillocks, 1986). Research also demonstrates that interaction with peers in writing groups improves the quality of student writing. For instance, in one semester-long study of 250 students’ writing in 13 different classes, it was discovered that students who worked in writing groups made better revisions in their papers and demonstrated greater gains in essay-writing performance by the end of the term than did students who worked alone (Nystrand, 1986).

Lastly, keep in mind that in the real world of work, professionals regularly seek help from co-workers when they write reports, memos, and proposals. Even professional writers share their drafts with other writers to obtain feedback at different stages in the writing process (Leahy, 1990).

**Remember:** You can form writing teams with peers at any stage in the writing process, whether it may be brainstorming possible ideas to include in your paper, reviewing your first draft, or proofreading your final draft.

**Writing the Final Draft**

The final draft of your paper is the version that includes all revisions you’ve made during your reading and editing stage, plus any back you may have received from other readers. Your final draft is only complete after you are satisfied with the quality of your paper’s *content* (ideas), *structure* (organization), and *form* (writing style). Realistically, a high-quality final draft requires completion of at least two previous drafts. Writing multiple drafts of a paper does not mean that you are a slow or ineffective writer; to the contrary, it is a sign of a good writer whose final product has been carefully reviewed, revised, and improved.

**Remember:** Do not expect to write a perfect draft of your paper on the first try. Even professional writers report that it takes them more than one draft (often three or four) before they produce their final draft. Although the final product of award-winning writers may look great, what precedes it is a messy process that includes lots of revisions in-between the first try and the final product (Bean, 2001).

"I’m not a writer; I’m a rewriter."

—James Thurber, award-winning American journalist and author

**Reviewing Your Written Work after it’s Returned to You**

Sometimes, no matter how hard you try to anticipate and demonstrate everything expected of you on a writing assignment, there are some things that can only be learned and corrected *after* you’ve received feedback from your instructor on your performance.

Review your paper closely when you get it back and pay special attention to any of your instructor's written comments. If the grade you receive is lower than you expected, try not to get emotional or defensive. Instead, learn from your mistakes and use your instructor’s comments as constructive feedback to improve your performance on future assignments. Make special note of your most common mistakes and those that resulted in the largest loss of points. If you are unclear about what went wrong or what needs correction or improvement, make an appointment to see your instructor during office hours. Receiving personalized feedback from the very person who has evaluated your work, and who will be evaluating your future work, may be the most powerful way to improve your future performance and final grade.

If your instructor is willing to meet with you during office hours and review your paper with you, take full advantage of this opportunity. Besides obtaining useful feedback, it also sends a clear message to the instructor that you are a serious student who wants to learn from mistakes and achieve excellence.

ResearchStrategies

In addition to assignments and relating to material covered in course readings and class lectures, you are likely to be assigned research projects that involve writing in response to information that require you to locate and evaluate information on your own. A key goal of the liberal arts is to help you become a self-reliant, lifelong learner. One key characteristic of independent lifelong learning is *information literacy*—the ability to locate, evaluate, and make use of information. If you are information literate, you know where and how to find information when you need it, and how to judge its quality once you've found it (National Forum on Information Literacy, 2005).

In the following section, six major strategies for searching, locating and evaluating information are discussed along with strategies for using that information to write college research papers that demonstrate higher-level thinking.

Identify Your Research Topicor Question

If your instructor does not assign you a specific topic or research question for your paper, you have a golden opportunity to select a topic that has the most interest or use to you. Just be sure that your topic is relevant to the assignment and that its scope is neither:

l too *narrow*—too little information is available (or accessible) on the topic, or

l too *broad*—too much information is available on the topic to reasonably cover within the maximum number of pages allowed in your paper.

If you have any doubts about your topic’s relevance or scope, before you go any further, seek feedback from your instructor or from a professional in your college library.

**Remember:** Librarians are information-research experts who are also out-of-class instructors. Be sure to capitalize on their expertise.

Locate Potential Sources of Information

You have two major resources you can use to search for and locate information:

1. Print resources—e.g., card catalogs, published indexes, and guidebooks; and

2. Online resources—e.g., online card catalogs, Internet search engines, and electronic databases.

Since different information-search tools are likely to generate different results, it’s best not to rely exclusively on just one research tool. For regularly updated summaries of different electronic search engines, how they work, and the type of results they produce, check the following Web sites:

searchenginewatch.com

researchbuzz.com.

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Snapshot Summary

Key Technology-Related Research Terms

As you read the following list, make a note after each item indicating:

a) whether you’ve heard of it before, and

b) whether you’ve used it before.

**Database**: a collection of data (information) that has been organized to make the information easily accessible and retrievable. A database may include:

a. *reference citations*—e.g., author, date, and publication source;

b. *abstracts*—summary of the contents of a scholarly article;

c. *full-length documents*; or

d. a combination of (a), (b), and (c).

**Subscription Database**: a database that can be accessed only through a subscription.

For instance, most of the electronic databases available in libraries are paid for through subscriptions. Subscription databases usually contain information sources that are more scholarly and closely monitored for quality than do databases that are free and accessible to you on the World Wide Web.

**Catalog**: a library database that contains information about what information sources the library owns and where they are located. Most catalogs are now in electronic form; however, a library may have some or all parts of its catalog available on cards (i.e., a *card catalog*).

**Key Word**:a word used to search multiple databases by matching the search word to items found in different databases.

Key words are very specific, so if the exact word is not found in the database, any information related to the topic you're researching that doesn't exactly match the key word will be missed. For example, if the key word is “college,” it will not pick up relevant sources that may have “university” instead of “college” in their titles.

**Wildcard**: a symbol, such as an asterisk (\*), question mark (?), or exclamation point (!) that may be used to substitute different letters into a search word or phrase, so that an electronic search will be performed on all words represented by the symbol.

For example, an asterisk at the end of the key word, *econom\**, may be used to search for all information sources containing the words “economy,” “economical,” or “economist.”

**Descriptor** (a.k.a., **Subject Heading**): a key word or phrase in the index of a database (Card or Catalog) that describes the subjects or content areas found within it, allowing you to locate relevant sources during your search.

For example, “emotional disorders” may be a descriptor for a psychology database to help researchers find information related to anxiety and depression. (Some descriptors or subject headings will be accompanied by suggestions for different words or phrases that you can use in your search.)

**Search Thesaurus**: a list of words or phrases provided by some databases that have similar meaning, allowing you to identify which of these words or phrases are used as key words, descriptors, or subject headings in the database. This feature enables researchers to choose the correct search term before beginning the search process.

Source: Adapted from “Glossary of Library and Web Terms” by Diana Hacker, 2006 (http:www.dianahacker.com).

For a complete glossary of Internet terms, see: “Matisse’s Glossary of Internet Terms” at http://www.matisse.net/files/glossary.html.

When you locate a source, your first step is to evaluate its relevance to your paper’s topic. One strategy for efficiently determining the relevance of a source is to ask if it will help you answer one or more of the following questions about your topic: Who? What? When? Where? Why? How?

"I keep six honest serving men. They taught me all I knew. Their names are what and why and when and where and how and

 who."

 —Rudyard Kipling, Indian-born English author, and winner of the Nobel Prize for Literature

However, the first important question to ask yourself about potential sources is whether they are acceptable to the instructor who assigned your research paper. Before you even begin the information-search process, be sure you know what sources your instructor requires or prefers.

Evaluate the Quality of Your Sources

The primary purpose of your sources is to provide *documentation*—to serve as references that support or reinforce the points you make in your paper. Since sources of information can vary widely in terms of their quality, you will need to think critically and make sound judgments about what are “good” sources to select and use as documentation. The Internet has made this selection process more challenging because most of its posted information is “self-published” (Academic Integrity at Princeton, 2003). This means that the posted information was not subjected to the same quality control measures as information published in journals and books—which are published only after being reviewed for acceptance by a neutral panel of experts and then carefully edited by a professional editor. Listed below are some criteria to help you critically evaluate the quality of the sources you ­locate.

l **Credibility:** Is the sourcewritten by an authority or expert in the field, such as someone with an advanced educational degree and/or professional experience related to the topic? For example, if your topic relates to an international issue, a highly credible source might be an author who has an advanced degree in international relations or professional experience in international affairs.

l **Scholarly:** Is the source a scholarly publication that has been reviewed by a panel or board of impartial scholars or professional experts in the field before it was published? If you see that the source has been “peer reviewed” or “peer refereed,” it means that it has been reviewed, evaluated, and approved for publication by other experts in the field. This is a good indication that the source represents a *scholarly* publication. For example, professional journals are peer reviewed (e.g., *New England Journal of Medicine*) but not popular magazines (e.g., *Newsweek*) or popular Web sites (e.g., Wikipedia.org).

l **Currency:** Is it an up-to-date or recently released source of information? In certain fields of study,

 such as the natural and social sciences, recent references may be strongly preferred because

 new data is generated rapidly in these fields and information can become quickly outdated. In

 other fields, such as history and philosophy, older references may be viewed as “classics,” so

 citing them may be perfectly acceptable. If you’re not sure if current references are strongly

 preferred, check with your instructor before you begin the search process.

l **Objectivity:** Is the author likely to be *impartial and unbiased* toward the subject? Consider how the professional position or personal background of the authors may influence their ideas or their interpretation of evidence. Scholarly authors should attempt to write with objectivity, minimize emotional or political involvement with the topic, and not be in a position to gain personally from favoring a certain conclusion about the topic. For instance, you are more likely to suspect that biased information may appear on Web sites whose address ends with “.com”—indicating that it’s a “com”mercial site whose primary purpose is to sell products and make money, rather than to educate the public and engage in the objective pursuit of truth. Or, suppose your topic relates to a controversial medical issue and you find an article written by medical doctors who are likely to benefit economically from taking one side on the issue. It would be reasonable to expect that this author may have a conflict of interest and will be biased toward reaching a conclusion that favors the side of the issue that will advantage them financially. In this case, the objectivity of the article may be questionable, and you may not want to use it as a source in your paper. If you think it's a well-written article with useful information and solid arguments, you can cite it in your paper, but you should demonstrate critical thinking by noting that its conclusions may have been biased by the author’s background or position.

If authors or researchers are not neutral, or have vested interest in the results, it increases the risk that they will find what they *want* to find. In scientific research, this risk is referred to as experimenter bias, and it stems from the natural tendency for people to see what theyexpect, hope, or want to see (Rosenthal, 1966, 1974).

**Remember:** **If you have any doubt about the objectivity or authenticity of a reference that you’ve located, play it safe and double-check with your instructor or a professional librarian.**

Personal Experience

Soon after my wife and I got married, we moved to a new city and tried to find a place to live. We got up early, skipped breakfast, and drove to the town where we were planning to move. We were determined to find an apartment to rent before lunch, but we found ourselves still driving around town looking for a place in the middle of the afternoon. By this time, both of us were extremely hungry because we hadn’t eaten anything all day, so we decided to stop looking for a place to live and start looking for a place to eat.

Unfortunately, we had about as much luck finding a place to eat as we did finding a place to live. It was approaching 4 p.m. and we were now beginning to hear the lion-like growls of each other’s stomach. Then, suddenly, my wife elbowed me (hard) while I was driving and said: “Joe, look—fried chicken!” She pointed to a flashing sign in the distance that I couldn’t read clearly, but I figured her long-range vision was better than me, so I put the pedal closer to the metal and sped up to get there as fast as was legally possible. As we continued down the road, I still couldn’t see any sign that clearly read “fried chicken,” but finally I did see a flashing sign and thought to myself, “Yee-hah, food!” However, as I drove closer and closer to the flashing sign, it became clearer and clearer to me that it didn’t spell FRIED CHICKEN at all. Instead, it was a sign flashing the words: FREE CHECKING! FREE CHECKING!

We had a great laugh, but my hungry wife wasn’t joking when she first saw the flashing sign in the distance; she really did think the flashing the words were “fried chicken.” That experience proved to me beyond a doubt that human beings do tend to see what they *want* to see (or *hope* to see)!

—Joe Cuseo

**Pause for Reflection**

Have you ever had the experience of seeing what you expected or wanted to see, rather than seeing it accurately or objectively? If not, have you ever observed this happen to someone else?

What was the situation?

Why do you think the situation was not viewed accurately or objectively?

Evaluate the Quantity and Variety of Your Sources

Your research is likely to be judged not only in terms of the validity or accuracy of your particular sources, but also in terms of the overall collection of references used in your paper. Your total set of references is likely to be evaluated in terms of the following criteria:

l *Quantity* of references: Are there enough references? As a general rule, it's better to use as many references as possible because this should result in a paper with more perspectives and one that is more comprehensive or complete. Using multiple references also prevents you from relying too heavily only on one or two sources and reduces the risk of being accused of plagiarism. In addition, using multiple sources provides you with the opportunity to demonstrate the higher-level thinking skill of synthesis because you can integrate ideas drawn from many different sources to create a final product that is uniquely your own. Be sure, however, to include only sources in your reference section that you actually used (cited) in the body of your paper.

l *Variety* of references: Have you used different *types* of sources? For some research papers and some professors, the diversity of resources used will matter as much as their quantity. You can intentionally vary your sources by drawing on different types of references, such as:

\* books,

\* scholarly journals—written by professionals and research scholars in the field,

\* magazine or newspaper articles—written by journalists,

\* course readings or class notes, and

\* personal interviews or personal experiences.

Sources can also vary in terms of whether they are *primary sources*—first-hand information or original documents (e.g., research experiments or novels), or *secondary sources*—publications that rely on or respond to primary sources (e.g., a textbook, or an article that critically reviews a novel or movie). Using a balanced blend of older, classic sources and newer, cutting-edge references may also be desirable because it may enable you to demonstrate how certain ideas have changed or evolved over time, and how certain ideas have withstood the test of time or continue to remain relevant.

As a general rule, it's better to include a wider variety of sources than to rely on a limited number of references. However, the best rule is to know exactly what types of references your instructor requires or prefers, and if you are unsure, find out before beginning the search process.

Use Your Sources as Stepping-Stones to Higher-Level Thinking

Your paper should represent something more than composite summaries of information obtained from your sources. Simply collecting and compiling the ideas of others will result in a final product that reads more like a high school book report than a college research paper. Remember that your sources just provide the raw material for your paper; you take and shape that raw material into a finished product by using higher-level thinking skills to analyze, synthesize, and evaluate it. Since it’s your name that appears on the front cover of the paper, *you* should be in it—it should contain *your* critical judgments and original ideas. Don't just report or describe information you’ve drawn from your sources; instead, react to them, draw conclusions from them, and use them as evidence to support your reactions and conclusions. (The questions for triggering different forms of higher-level thinking listed on pp. 181-182 may be used to help infuse higher-level thinking into your paper.)

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**Remember**: **Research involves both generating your own ideas and placing your ideas in a larger context that includes the ideas of others. You want to demonstrate that you’ve done your *research* by citing the ideas of others, but you also want to demonstrate higher-level thinking by connecting, evaluating, and expanding on those ideas to create your judgments and conclusions.**

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Cite Your Sources Accurately

Properly citing and referencing your sources is a form of academic integrity and intellectual honesty that gives credit where credit is due. It credits others whose work or "intellectual property" you've borrowed, and it credits you for the research you have done. It also credits you for your own ideas because information that’s not referenced will stand out clearly as your own thoughts and unique contributions.

Whenshould sources be cited?

You should cite the source for anythingyou *include in your paper that does not represent your own work or thoughts*. This includes other people’s words, ideas, statistics, research findings, and visual work (e.g., diagrams, pictures, or drawings). There is only one exception to this rule: **You do not need to cite sources for factual information that is *common knowledge*—information that most people already know.** For example, common knowledge includes well-known facts (e.g., the earth is the third planet from the sun) and familiar dates (e.g., the Declaration of Independence was signed in 1776). If you're not sure if a piece of information represents common knowledge, one rule of thumb is to check an encyclopedia. If you find it there, then you probably don’t need to cite its source in your paper. However, there may be exceptions to this rule (Academic Integrity at Princeton, 2003), so if you’re in doubt about whether or not to cite a reference, the best rule to follow is to consult with your instructor or a librarian.

The Internet has allowed us to gain easy access to an extraordinary amount of information and has made research much easier—that’s the good news. The bad news is that it has also made proper citation more challenging. Determining the true “owner” or original author of posted information or where it was first produced isn’t as clear-cut as it is for published books and articles. If you have any doubt, print it out and check it out—with your instructor or a professional librarian. If you don’t have the time or opportunity to consult with either one of them, then play it safe and cite the source in your paper. If you cannot find the name of an author, at least cite the Web site, the date of the posted information (if available), and the date you accessed or downloaded it.

**Remember:** As a general rule, whenever you’re unsure about whether you should cite a source, it’s better to cite it and risk being corrected for over-citing sources than to risk being accused of plagiarism—a serious violation of academic integrity that can have grave consequences (e.g., probation, suspension, or expulsion).

Where and how should sources be cited?

There are two places where you should cite your sources:

1. The body of your paper and

2. The reference section at the end of your paper (also known as a “bibliography” or “works cited” section).

Student Perspective

“Although it may seem like a pain to write a works cited page, it is something that is necessary when writing a research paper. You must acknowledge every single author of whose information you used. The authors spent much time and energy writing their book or article [so] you must give them the credit that they deserve.”

—First-year student reflection on a plagiarism violation

How you should cite your sources will depend on the referencing style of the particular academic field for which you're writing your paper. It's likely that you will be expected to use either one of two referencing styles during your first year of college:

1. *MLA* style—standing for the *M*odern *L*anguage *A*ssociation, which is the citation style commonly used in the Humanities and Fine Arts (e.g., English and theatre arts); or

2. *APA* style—standing for the *A*merican *P*sychological *A*ssociation, which is the citation style most commonly used in the social and natural sciences (e.g., sociology and ­anthropology).

It’s also possible that you may be asked to use other styles in advanced courses in specialized fields, such as *The Chicago Manual of Style* for papers in history, or the Council of Biology Editors (CBE) style for papers in the biological sciences. Thus, be sure you are aware of the referencing style that is expected or preferred by your instructor before you begin to write your paper.

When you use someone else’s *exact words* in the body of your paper, place parentheses around those words and cite the specific page number of your source. If you don't use an author's exact words, paraphrase them in your own words, and immediately after your paraphrase, cite the author’s name and the year of the publication. To ensure that you are paraphrasing and not plagiarizing your source, write your summary without looking directly at the source itself. After you’ve completed your summary, check the source to see if you accurately captured the author’s main ideas without copying the author’s actual words (Purdue University Online Writing Lab, 1995–2004). If you paraphrase several ideas from the same source within the same paragraph, you do not need to cite the author after every single sentence. Instead, cite the source only once—at the end of the paragraph.

Student Perspective

“I really had no clue I was doing anything wrong because I didn’t put it in word for word. I learned that plagiarism is not just copying it word for word, but it is also about [using] the idea.”

—First-year student reflection on a plagiarism violation

Speaking & Higher-Level Thinking

Speaking is not just a communication skill; it's also a learning strategy that keeps you actively involved in the learning process by engaging you in physical action (moving your tongue and lips). It also enables you to “hear” your thoughts, which puts you in a better position to evaluate whether or not they make sense. Just as writing provides you with a visual product that can be seen and used as feedback to improve the quality of your thoughts, speaking provides an *audible* product that can be heard and used as feedback to improve the quality of your thinking.

“Until a student hears herself expounding [explaining] or questioning, she may not know what she thinks, which is why speaking

 empowers future thinking and speaking. As soon as she hears that she has asserted [stated] something, even in the form of a

 question, she puts herself in the position of being able to criticize her own thought”

 --Margaret Gullette, former director of the Center for Teaching and Learning, Harvard University

**Speaking Strategies that Promote Higher-Level Thinking**

**Think aloud while you attempt to solve problems.**When you’re solving problems in math or science, think about the mental steps you’re taking and state them aloud. This will enable you to become more aware of the thought process you use while solving problems. Research indicates that the quality of students’ higher-level thinking is enhanced when they are asked to think out loud as they solve problems (Ahlum-Heather & DiVesta, 1986). This is probably due to the fact that thinking aloud allows you to:

l consciously attend to your thought process, and

l convert your silent (internal) thoughts into audible (external) sounds that you can hear, respond to, and use as feedback to improve your thinking (Resnick, 1986).

**Pair up with another student.** Pose higher-level thinking questions to each other, such as those suggested on pp. 181-182. One poses the question and the other uses higher-level thinking to answer it. Alternate roles so each of you has the opportunity to assume the role of both questioner and respondent. Research indicates that students who work in pairs and use this type of question-and-answer interchange are more likely to display higher levels of thinking on course examinations (King, 1995).

**Form discussion groups or learning teams.** Research consistently shows that when college students engage in group discussions about class material with their peers, they're more likely to develop critical thinking skills than by just listening to lectures and recording notes (Kulik & Kulik, 1979).

**Enroll in small seminar classes where you are expected to speak.** Small classes will provide you with opportunities to become actively involved by expressing your thoughts orally and receiving feedback on the quality of your thinking.

**Sit in the front of class.** You're more likely to respond orally to your instructor’s thought-provoking questions and ask questions of your instructor if you’re not sitting behind a large number of classmates who turn around to look at you every time you speak.

**Strategies for Rehearsing Oral Presentations**

Listed below are speech-rehearsal strategies that you may use to improve your preparation and delivery of oral presentations.

\* During rehearsal, use index cards to trigger your memory of your major points and arrange the order of the cards in a sequence that will keep your presentation on track from start to finish. If you write your major points on separate index cards, they can serve as memory cues to trigger your recall of specific details relating to the major point. Index cards are also compact and easy to handle, so you can bring them with you and use them as “cue cards” during your presentation.

\* If possible, rehearse your speech in the same place where you will be delivering it (e.g., in the same classroom or a similar classroom). When you rehearse and deliver your presentation in the very same place, you see the same visual features during delivery of your speech that you saw when rehearsing, which helps trigger your memory of the rehearsed information. Furthermore, the room’s familiarity should make you feel less anxious during the actual delivery of your presentation.

 During rehearsal, pay special attention to the following parts of your presentation:

a) The introduction should be rehearsed carefully because it sets the stage and creates a powerful first impression.

b) Statements that signal your transition between major categories of ideas (e.g., statements that move you from one index card to another). This serves to highlight your presentation’s organization, showing how its separate parts are connected.

c) Your conclusion should be carefully rehearsed because this is your chance to finish strong and create a powerful last impression.

\* Rehearse the total timeit takes to complete your presentation to see if it falls within the time range set by your instructor, making sure that it’s neither too short nor too long.

\* Practice making periodic eye contactwith an imaginary audience by periodically lifting your head from your notes or index cards to look at different chairs in the room. During your presentation, you can occasionally look at your notes or index cards and use them as cue cards to help you recall the key points you intend to make. However, your notes shouldn't be used as a script that’s read verbatim (word for word). An oral presentation is a form of public *speaking*, not a public *reading* of something that’s been written out entirely in advance.

 On the other hand, a formal presentation is not an impromptu speech that’s spontaneously delivered “off the top of your head.” Instead, your oral presentation should be *extemporaneous*—something in-between a formal reading and an impromptu speech that requires advanced preparation and use of some notes, but isn’t something written out entirely in advance and memorized (or read) word for word (Luotto, et al., 2001). Extemporaneous speaking allows some room to ad lib or improvise, particularly if you forget the exact words you intended to use. It can help keep you from getting flustered if you forget something you rehearsed, and prevents the audience from even noticing that you forgot it.

\* Get feedback on your presentation before officially delivering it.

Ask a friend or group of friends to listen to your presentation and ask for their input. Not only can peers provide valuable feedback, they can also provide a “live audience” that makes your rehearsal more realistic and effective because it more closely matches what you'll do during your actual performance. The closer the match between your practice and performance situations, the more comfortable you should feel during the actual delivery of your presentation. In fact, research indicates that fear of speaking in front of a class is reduced if students first have the opportunity to share their ideas with a small group of peers (Neer, 1987).

Another way to obtain feedback prior to your actual presentation is to have a friend videotape your delivery of it. This strategy allows you to view your presentation as if you were a member of the audience. Viewing yourself on tape is almost like having an “out-of-body experience” because it enables you to step outside of your body and view yourself as others view you. This type of feedback can dramatically increase self-awareness of your communication habits, particularly your nonverbal behavior (body language).

Similar to the way writing provides you with a visible product of your thoughts that can be reviewed and used to improve the quality of your thinking, videotapes provide a visible product of your spoken thoughts that can be reviewed and used as feedback to improve the quality of your speaking (and thinking). You may be a bit shocked when you first see how you look and hear how you sound on videotape, but this is a normal reaction. After a while, the initial shock will fade and you'll grow more comfortable viewing and reviewing your presentations.

**Pause for Reflection**

Have you ever received feedback on the quality of your speaking skills from an instructor, a peer, or by observing yourself on videotape?

If you have, what did you learn from this feedback?

If you haven’t, would you be willing to seek feedback from other on your speaking skills?

Strategies for Reducing Speech Anxiety

*Before Delivering a Speech:*

l When practicing your speech, try to match your practice situation to the actual performance situation. For instance, speak out loud and at the same volume that you’ll use during your actual speech, and try to practice delivering your presentation at least once in the same room where you will actually deliver it.

l Carefully observe presentations made by other students and note what relaxed, effective speakers do during their speeches for hints about what you could do to be equally relaxed and successful when you speak.

l Practice and learn your introduction especially well. This will enable you to get off to a smooth start and give you an early sense of confidence, which should reduce your anxiety for the remainder of your presentation.

l Prepare your body and mind for the speech by getting adequate sleep the night before your presentation and eating well on the day of the presentation. Also, avoid consuming caffeine or other stimulating substance prior to speaking because an elevated level arousal during your speech may also elevate your level of tension.

l Come prepared with all the equipment you can use to support your presentation (e.g., notes, index cards to jog your memory, and visual aids to illustrate your points). Also, try to bring backup equipment in case you encounter any unexpected technological problems. Knowing that you’re fully equipped should reduce your worries about something going wrong, and if something does go wrong, you’ll have a plan to deal with it immediately and you’ll avoid the anxiety-producing hassle of trying to figure out what to do at the spur of the moment. Simply stated, the more organized and prepared you are for a public performance of any kind, the less anxiety you’re likely to experience during the performance.

l Try to get to the site of your speech early, so you have time to settle in and settle down before delivering your presentation. In the minutes just prior to delivering your speech, relax yourself by taking deep breaths and visualizing a successful performance.

l Since thoughts can influence our emotions, and positive thoughts trigger positive emotions (Ellis, 2000), come to your speech with a positive mindset. For example:

1. Keep in mind that it’s natural to experience at least some anxiety in any performance situation, especially in a situation that involves public speaking. This isn't necessarily a bad thing; if your anxiety is kept at a moderate level, it will actually increase your enthusiasm, energy, concentration, and memory (Rosenfield, 1988; Sapolsky, 2004).

2. Don’t expect to give “the perfect speech” like a TV reporter delivering (actually reading) the nightly news. Just as some verbal mistakes or short lapses of memory can take place during normal conversations without destroying the conversation, so too can errors or slips take place during speeches without destroying the overall quality of the speech. You can still receive an excellent grade on an oral presentation without delivering a flawless performance.

3. Remember that if you happen to forget a point or two, the audience will not know that you forgot those points, only you will. Similarly, any anxiety you may feel internally during your speech will often not be externally visible to your audience and goes unnoticed.

4. Think of your speech as something similar to a normal conversation; the only difference is that you’re speaking to more than one person at a time, and it’s a conversation that you’ve had the opportunity to prepare for in advance. Since you’ve been speaking every day since you were a toddler, speaking to more than one person is just a slight extension of what you’ve done comfortably throughout your life. To help get yourself into this more informal and relaxed mindset, look at one person at a time while you’re delivering your speech. (However, periodically change your focus to a person in different sections of the room to ensure that you’re making looking in the direction of different members of the audience.)

5. Keep in mind that the audience to whom you are speaking is not made up of expert speakers. Most of them have no more public speaking experience than you do, nor are they experienced critics. These are your peers and they’re very aware how stressful it can be to get up in front of a class and deliver a public presentation. Thus, they're likely to be very understanding and accepting of any mistakes you happen to make, just as they hope you'll be for them when it’s their turn to stand and deliver.

*During Delivery of a Speech:*

l Feel free to move around a bit, rather than remaining motionless. When you’re experiencing even moderate stress, your body releases adrenaline—an energy-generating hormone. Thus, it may be natural for your body to want to move during your speech and expend its extra energy. Physical movement during the speech will help you burn up that extra energy and help burn off some anxiety. Furthermore, research shows that some movement and gesticulation on the part of the speaker helps hold the audience’s attention more effectively than standing motionless (Andersen, 1985). Remaining motionless may convey the message that you're emotionless about the topic of your speech.

 You may also move in a way that reinforces your transition from one key point to another during your speech by moving to a different position or place in the front of the room as you move conceptually from one point to the next. Naturally, however, you don't want to be running all over the place or engage in movements that interfere with audience attention to your message, such as repeated nervous movements (e.g., jiggling things in your pockets or clicking your pen). Such nervous fidgeting can distract the audience from the content of your spoken message and detract from the overall quality of your speech.

l Focus attention on the *message* you’re delivering (the content of your speech), *not the messenger* who’s delivering it—you. By remaining conscious of the ideas you’re communicating, you improve your expression of those ideas, and become less self-conscious about the impression you’re making on the audience and their impression (evaluation) of you.

l If you continue to experience high levels of speech anxiety after implementing the above-mentioned strategies, seek the advice and help from a professional in your Academic Support or Personal Counseling Center.

**Pause for Reflection**

Rate your level of speech anxiety in the following situations.

1. Large Groups (e.g., asking a question in a class of 30 or more students):

 highly anxious  somewhat nervous  fairly relaxed  very relaxed

2. Small Groups (e.g., speaking in a discussion group of 3–5 students):

 highly anxious  somewhat nervous  fairly relaxed  very relaxed

3. Pairs (e.g., talking over an assignment with a classmate):

 highly anxious  somewhat nervous  fairly relaxed  very relaxed

What strategies could you use to reduce your level of anxiety in the group situations(s) where you feel most anxious about speaking?