

Guide for Peer Assisted Learning (PAL) Group Facilitators

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<http://www.tc.umn.edu/~arend011/FacilitatorToolkit.pdf>

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Acknowledgments

The following individuals and organizations are important sources of information directly or indirectly for the development of these training materials. You are encouraged to consult these sources for more information on peer assisted learning programs.

College Readings and Learning Association

(The International Tutor Training Certification Program)

<http://crla.net/tutorcert.htm>

H&H Publishing Company

(NADE self-evaluation guides: Models for assessing learning assistance/developmental education programs)

<http://www.hhpublishing.com>

National Association for Developmental Education

(Course-based Learning Assistance and Tutor Program Certification Program)

<http://nade.net/G.%20certification.htm>

Peer Cooperative Learning Program Bibliography

(Annotated Bibliography)

<http://www.tc.umn.edu/~arend011/Peerbib03.pdf>

Peer-Led Team Learning (PLTL)

(Articles, Web Links to Other PLTL Programs, Training Programs)

<http://www.pltl.org>

Structured Learning Assistance (SLA)

(Articles)

<http://www.ferris.edu/sla/>

Supplemental Instruction (National Center)

(Articles, Web Links to Other SI Programs, Training Programs)

<http://www.umkc.edu/cad/si/>

Supplemental Instruction (Special Professional Interest Network)

(SI Leader Training Materials)

<http://www.iup.edu/lec/AcadAssist/SI/SI%20Help.htm>

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Peer Assisted Learning (PAL) Program Overview

Underline the key words or concepts in this summary of PAL programs.

PAL programs focus on serving historically difficult college courses. These are courses that have a high rate of D or F final course grades or withdrawals. The PAL does not focus on high-risk students, but rather on very difficult and challenging courses. These same courses are commonly listed across the U.S. by other PAL programs.

To meet this need of students, the PAL program offers a regular schedule of out-of-class sessions that are facilitated generally by a fellow student. This student, called a facilitator, has often already taken the same class by the instructor and has earned a high final course grade and are competent in the subject matter.

The PAL sessions are offered throughout the academic term, beginning with the first week of class. The sessions occur in classrooms in the same area as where students attend the class. These sessions are free and open to any student in the class. While an attendance roster is gathered of those who participate, the course instructor does not know who attends and who does not.

Since the PAL program is open to anyone in the class who wants to improve their grades, there is not a general perception that the program is remedial. PAL sessions attract students of various academic abilities. Regardless of their ability level, students discover new skills and knowledge.

The PAL facilitators receive extensive training both before and during the academic term. Topics for training include peer cooperative learning strategies, study strategies, and study group management. Professional staff from the PAL program periodically observe the PAL sessions and provide helpful feedback to the facilitators. Periodic team meetings are held of the PAL facilitators and staff.

PAL facilitators attend all class sessions, take notes, read all assigned readings. They prepare for their sessions and conduct three or more of them each week.

PAL sessions integrate “what to learn” with “how to learn it.” Students who attend the sessions discover new learning strategies, connect ideas in the class, review key concepts from lecture and text, and increase their confidence. These

sessions are highly interactive with the PAL facilitator managing the discussion and not providing answers. Instead the questions are redirected back to the group and answers sought in each other's lecture notes along with review of the textbook and assigned readings.

The PAL professional staff is responsible for the administration of the program. These individuals identify the targeted courses, gain instructor approval, select and train PAL facilitators, observe PAL sessions, coach and supervise the PAL facilitators, and evaluate the program.

In a review of national studies of PAL programs, participants earn higher final course grades and withdraw at a lower rate than non-participants. Data also suggests higher persistence rates towards graduation. Surveys of PAL participants and facilitators report both personal and professional growth as a result of their involvement.

Questions:

1. What are the key features of PAL programs?

2. What is the difference between being a facilitator and an instructor?

3. What happens during PAL sessions?

4. Why would students be interested in participating in PAL sessions?

Peer Assisted Learning (PAL) Session Principles

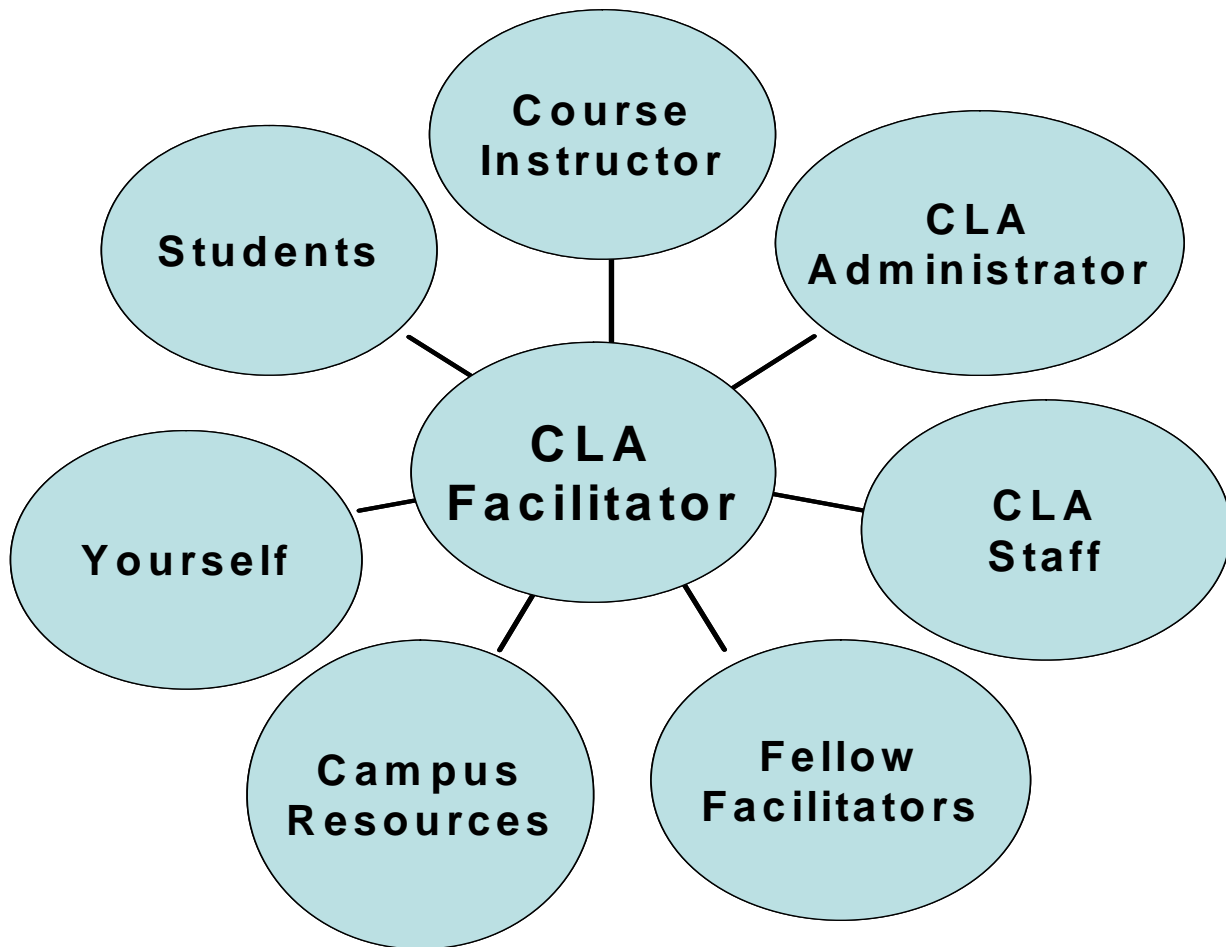
While there are a wide variety of activities that occur during PAL sessions, it is critical to focus on the basic principles that guide the activities and the decisions that the PAL Facilitator makes before, during, and after the PAL sessions.

Individual Principles	Sample of How the Principles Are Operational
<p>1. A blend of session activities are preplanned by the PAL Facilitator and requested by the student participants during the session.</p>	<p>A. Facilitator completes a session planning form beforehand. Session <u>activities</u> are based on individual needs and student's current understanding of content, number of participants, group dynamics, and Facilitator's best judgment.</p> <p>B. <i>(If applicable)</i> PAL Facilitator prepares worksheets prior to the session. Session <u>content and information</u> is based on homework problems, guidance from the course instructor and best judgment.</p> <p>C. Students co-create the session agenda by listing items on the marker board in the room.</p> <p>D. Identify concepts and vocabulary not understood by a majority of students attending the PAL session. If only one student has an issue, PAL Facilitator can elect to meet privately with the student and/or direct them to the campus tutorial program for individual attention.</p>
<p>2. While the PAL Facilitator remains an authority within the sessions, their visibility in this role shifts throughout the academic term with more power and responsibility shared with students.</p>	<p>A. Power and responsibility is gradually shifted to students throughout the term.</p> <p>B. Students become proactive in identify essential tasks for the group to complete during PAL sessions.</p> <p>C. The PAL Facilitator gradually decreases their talking and modeling of problem solving.</p> <p>D. Students are given opportunities to talk more during both small group cooperative learning activities and large group discussions.</p> <p>E. Students increasingly take ownership of identifying the steps needed to solve problems.</p> <p>F. Students go to the marker board and serve as scribe when solving problems for the group.</p> <p>G. Due to the high engagement by all members of the student group, by the end of the term it is difficult for outside observers to detect who is the PAL Facilitator.</p>

Individual Principles	Sample of How the Principles Are Operational
3. PAL Facilitator and participating students model productive learning behaviors that students adopt and adapt.	<ul style="list-style-type: none"> A. Both PAL Facilitator and session participants share strategies that are personally helpful.. B. Relate learning strategy directly to content and materials. C. Connections are made between the current course and the next one in the sequence or other courses within the major. D. Identify the most important information and concepts in the course. E. Look for “<i>teachable moments</i>” within the session to use a learning strategy in connection with course material. F. Preplan the use of a rotating set of learning strategies on the PAL session planning form. G. Keep these activities short and directly tied to the course material.
4. Sessions in various academic content areas are different based on the academic requirements unique to them.	<ul style="list-style-type: none"> A. PAL sessions appear and operate different in various academic content areas. B. Review PAL strategies from the manual and customize for use in the particular course. C. Factors that require different approaches for various academic disciplines: problem-solving, vocabulary, reading requirements, memorization, concept learning and synthesis among concepts.
5. There is high emphasis on understanding the process of solving a problem.	<ul style="list-style-type: none"> A. In problem-solving courses, the PAL Facilitator pre-selects a representative set of problems to work during the session. B. Worksheets emphasize different components of the problem-solving process. C. PAL Facilitator works through and solves all problems on the worksheet so that they can facilitate others <u>in the process</u> and avoid potential errors. D. During the session, students generate the steps to solving a problem and discuss their approach on the marker board <i>before</i> beginning with the problem set. E. Students work individually and in groups to solve problems in the textbook, notes, or worksheets. F. Students direct the scribe at the marker board on solving the stated problem.
6. Students develop skill in self-monitoring their comprehension of course material and adapt to the learning task.	<ul style="list-style-type: none"> A. Informal classroom assessment techniques are used to measure student understanding, help guide PAL session activities, and assess student learning. B. Students acquire strategies to self-test their own comprehension level with course material.

Individual Principles	Sample of How the Principles Are Operational
7. Multicultural sensitivity is expressed by the PAL Facilitator and the students.	<p>A. PAL Facilitator self-monitors their choices of content material, reading selections, and words spoken</p> <p>B. Session room is arranged so that students can see one another and converse easily.</p>
8. Students are actively engaged with the course material and with each other.	<p>A. Students express behaviors that indicate involvement: taking notes, reading material, solving problems.</p> <p>B. Students work with one another through cooperative learning activities created by the PAL Facilitator</p> <p>C. PAL Facilitator preplans a variety of learning activities to use in their sessions.</p> <p>D. (If applicable) Roles and responsibilities for each member of peer group are clearly stated by the PAL Facilitator.</p> <p>E. PAL Facilitator circulates around the room to monitor the small group sessions, provide help when needed and monitor when to bring the large group back together.</p> <p>F. PAL Facilitator debriefs the peer group learning activity and checks for correct information by leading a discussion of what the purpose/focus of the activity was, and what information was learned as a result of the activity.</p>
9. Good educational theory always guides effective learning practices.	<p>A. Carefully consider how individual PAL session activities and decisions made by the PAL Facilitator are guided by learning theories.</p>

Relationships of the PAL Facilitator



Relationships of the PAL Facilitator

1. Course instructor

- Serves as your academic mentor.
- Responsible for approving finalists for the facilitator position.
- Meet with course instructor weekly (*preferably during their office hours*) to discuss PAL activities and allow them to review handouts, worksheets, and mock exams.
- Some PAL programs have heavy involvement of the course instructor with designing PAL session worksheets and recommending session activities.
- Provides permission for access to ancillary instructor materials (*e.g., teacher's guide to textbook, test bank, study guides, and other materials*).
- Always supported during PAL sessions when students complain.
- Provides permission for facilitator to make class announcements.
- Be helpful for course instructor with minor class activities such as helping with distributing handouts, but do not become involved with grading or delivering lectures when instructor is absent.
- Course instructors are welcome to drop by for a short visit to a PAL session. However, they do not attend on a regular basis since it inhibits the dynamic of PAL sessions which differ from traditional activities that occur during class.
- Facilitator avoids being placed into a role of the instructor by delivering class lectures, grading examinations, or helping with examination preparation.
- Upon request by the course instructor, the facilitator provides anonymous feedback concerning student comprehension of course material and reaction to class lectures.

2. PAL program administrator

- The administrator is your ultimate supervisor.
- When experiencing potential conflicts between the instructor and the PAL program staff, this person is the ultimate authority.

3. PAL program staff

- These individuals are your coach, mentor, supervisor, and trainer.

4. Fellow PAL facilitators

- Seek out their advice on how they are conducting their PAL sessions.

- Visit one another's PAL sessions occasionally throughout the academic term to gain ideas to adopt and share feedback about the session upon request.

5. PAL student participants

- Seek to be a mentor and not an instructor or evaluator.
- Seek to share and model rather than lecturing.
- Treat all with respect and dignity.
- Encourage student participation and sharing of strategies that worked for them.
- Look for opportunities to make referrals to other campus and community resources based on student needs. With confidential matters, this communication should be made privately. Follow protocols regarding your supervisor in case of detecting significant student issues (*i.e., student in crisis*).

6. Campus and community resources

- Be familiar with resources from the campus and community that might be of use for students.
- Watch for opportunities to refer students to appropriate campus and community resources. Meet with the student privately if the issue is confidential.
- Keep PAL staff informed of students in crisis. Consult with them concerning referrals and interventions of a serious nature.

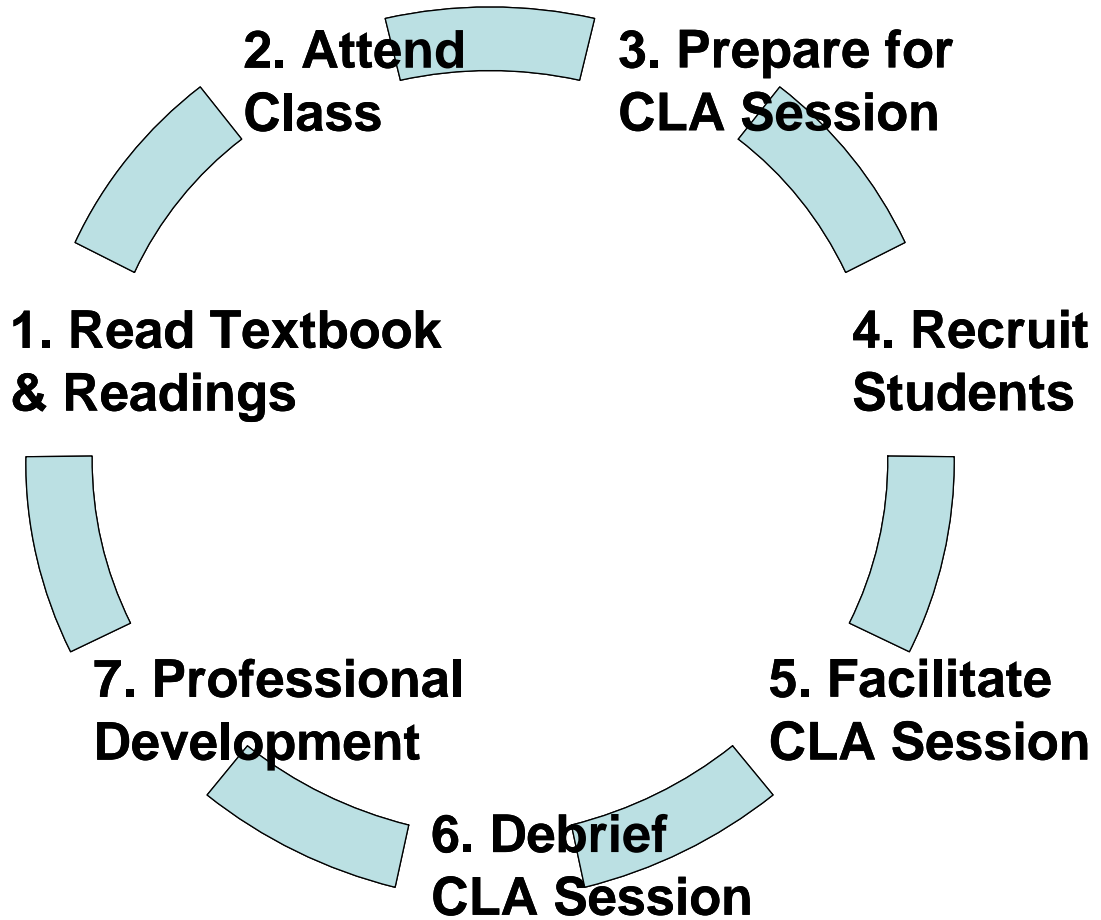
7. Taking care of yourself

- Establish a realistic time schedule for all activities.
- Ask for help from the PAL staff and fellow facilitators.

Principle One
Blend of PAL Session Activities

<p>1. A blend of session activities are preplanned by the PAL Facilitator and requested by the student participants during the session.</p>	<p>A. Facilitator completes a session planning form beforehand. Session <u>activities</u> are based on individual needs and student's current understanding of content, number of participants, group dynamics, and Facilitator's best judgment.</p> <p>B. (<i>If applicable</i>) PAL Facilitator prepares worksheets prior to the session. Session <u>content and information</u> is based on homework problems, guidance from the course instructor and best judgment.</p> <p>C. Students co-create the session agenda by listing items on the marker board in the room.</p> <p>D. Identify concepts and vocabulary not understood by a majority of students attending the PAL session. If only one student has an issue, PAL Facilitator can elect to meet privately with the student and/or direct them to the campus tutorial program for individual attention.</p>
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Tasks of the PAL Facilitator



Tasks of the PAL Facilitator

1. Read textbook and assigned readings

- Read the textbook and assigned readings before the material is covered during class sessions.
- With the permission of the class instructor, obtain the teacher's guide for the textbook, test bank, and other ancillary support materials.

2. Attend all class sessions in the targeted course

- Exhibit model student behaviors in class (*e.g., attend all class sessions, arrive early, take new lecture notes*).
- Do not answer questions during class since this may encourage other students to remain silent and inactive.

3. Prepare for PAL session

- Develop preliminary PAL session agenda and plan of action.
- Prepare handouts and worksheets as appropriate.
- Meet with class instructor and PAL staff for help with preparations.

4. Recruit students for the PAL sessions

- Make formal announcement to the students on the first day of class.
- Work with the class instructor and the PAL program staff to promote the program (*see separate handout for detailed description of various activities*).

5. Facilitate the PAL session

- Note the difference between instructing and facilitating.
- See following page for detailed discussion of how to facilitate PAL sessions.

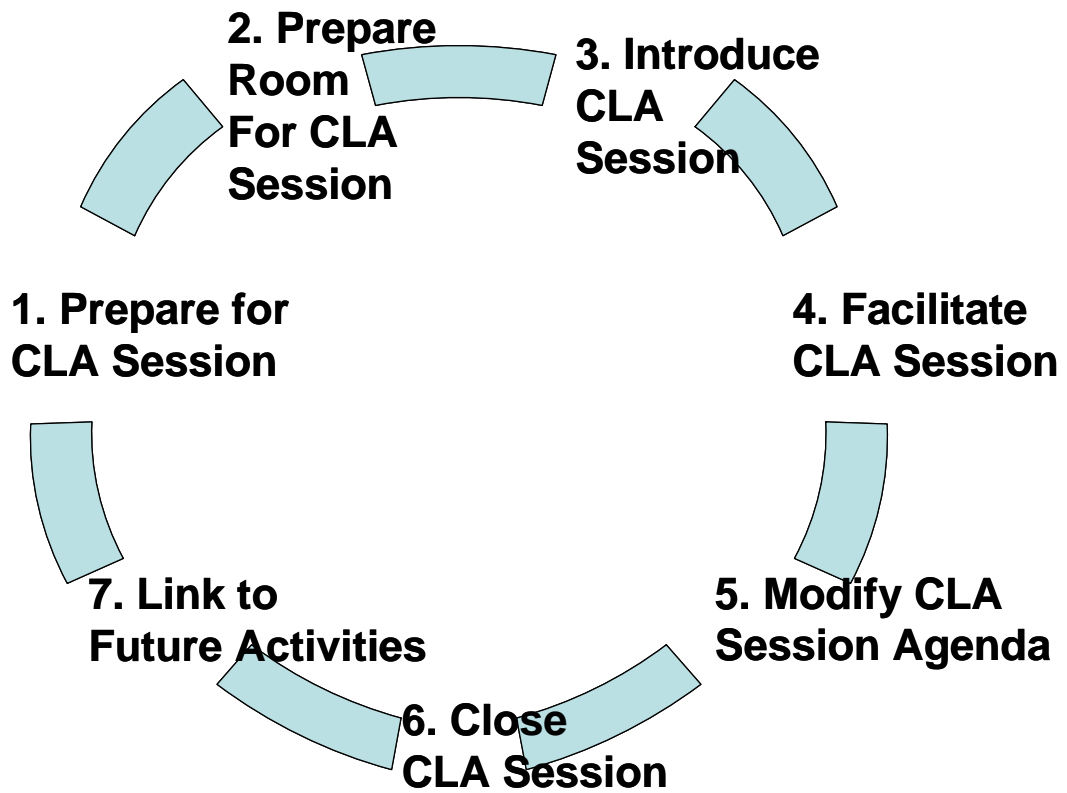
6. Debrief the PAL session

- Meet with PAL staff to discuss results of PAL sessions.
- Note difference between the preliminary agenda and action plan and what actually occurred during the PAL session.

7. Participate in professional developmental activities

- Participate in training workshop before beginning of the academic term.
- Attend periodic PAL team meetings and training updates during the academic term.
- Meet with the PAL staff frequently during the academic term.
- Visit other PAL facilitator sessions several times each academic term to gain ideas to implement and provide feedback upon request.

PAL Session Process



PAL Session Process

1. Prepare for PAL session

- Read the textbook and assigned readings before the material is covered during class sessions.
- With the permission of the class instructor, obtain the teacher's guide for the textbook, test bank, and other ancillary support materials.
- Develop preliminary PAL session agenda and plan of action.
- Prepare handouts and worksheets as appropriate.
- Only select most important concepts to review.
- Meet with class instructor and PAL staff for help with preparations.
- Customize PAL sessions for the type of academic content.

2. Prepare the room for the PAL session

- Arrange chairs in a circle or semi-circle.
- Have supplies needed to record discussion or do work on marker board.
- Choose where the facilitator will sit during the session. Be careful not to sit behind the teacher's desk as this creates an impression of you as a teacher and not a session facilitator.

3. Introduce the PAL session

- Develop a welcoming atmosphere during the session.
- Quickly remind all of the purpose of the PAL session and the role of the facilitator.
- Develop session agenda in collaboration with students.
- Collect attendance in session and remind participants that roster is used by the PAL program staff and not revealed to the course instructor.

4. Facilitate the PAL session

- Facilitate and do not instruct.
- Use the PAL session agenda as a guide for activities.
- Integrate "*what to learn*" with "*how to learn it.*". Employ wide variety of learning strategies and study skills during the PAL sessions.
- Redirect questions back to the group. Establish authority of the group members, group member lecture notes, textbook, and other reference materials.

- Make connections with what the students are learning (e.g., *previous and current PAL sessions, class sessions, textbook readings*).
- Correctly use the language of the academic discipline.
- Employ peer cooperative learning activities.
- Employ “*wait time*” during group discussions to encourage others to answer questions.
- Use the course syllabus, textbook, and assigned readings frequently during the session activities.
- Support the course instructor when students potentially complain during sessions.
- Monitor facilitator behaviors to avoid those that inhibit group members (e.g., *talking too much, answering questions, standing and talking, sitting behind school desk*).

5. Modify the CLA session agenda as needed

- Watch for “teachable moments” to share learning strategies.
- Shift to other activities if planned ones are not appropriate or do not work.

6. Close the PAL session

- Summarize what occurred during the PAL session (e.g., *informal quiz*).
- Help prepare students for upcoming exams (e.g., *predict exam questions*).
- Focus students on the main ideas of the class, PAL session, and/or readings (e.g., *one minute paper on the main point*).

7. Link the current PAL session to future activities

- Predict content of next class lecture.
- Refer to upcoming textbook and other reading assignments.
- Refer to syllabus to remind of upcoming academic events and assignments.
- Remind of upcoming schedule and location of PAL sessions.

Principle Two
Shift of PAL Facilitator Visibility

<p>2. While the PAL Facilitator remains an authority within the sessions, their visibility in this role shifts throughout the academic term with more power and responsibility shared with students.</p>	<ul style="list-style-type: none">A. Power and responsibility is gradually shifted to students throughout the term.B. Students become proactive in identify essential tasks for the group to complete during PAL sessions.C. The PAL Facilitator gradually decreases their talking and modeling of problem solving.D. Students are given opportunities to talk more during both small group cooperative learning activities and large group discussions.E. Students increasingly take ownership of identifying the steps needed to solve problems.F. Students go to the marker board and serve as scribe when solving problems for the group.G. Due to the high engagement by all members of the student group, by the end of the term it is difficult for outside observers to detect who is the PAL Facilitator.
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Planning the PAL Session

Course Name: _____ Date of Session: _____

PAL Facilitator Name: _____ Course Instructor: _____

What are the objective(s) of the PAL session? _____

What materials are needed for potential session activities?: _____

Academic Content to be Reviewed	Learning and Study Strategies Employed to Process Content	Cooperative Learning Activity Used
1.		
2.		
3.		
4.		
5.		
6.		
7.		

What strategies will be used to assess student learning in the PAL session?

How will the PAL session be concluded? _____

Expanding the Authority Within the Group to Answer Questions and Solve Problems

A major issue for students who attend PAL sessions is understanding the role of the PAL facilitator. The natural belief is that participants ask questions and facilitators provide answers. Changing this dynamic is one of the most challenging and important actions that the PAL facilitator will take.

Establishing Authority within the Group

Rather than focusing solely upon the PAL facilitator, it is essential to broaden the expertise and authority base within the group much broader. This is especially important for individuals to do well academically in classes which are not supported by the PAL program. The authority within the PAL sessions should include:

- Textbook
- Assigned supplemental readings
- Reference books, Internet sites, dictionaries, and other materials
- Lecture notes of individual students
- Lecture notes generated and revised by the entire group of PAL participants
- Prior knowledge by the PAL participants
- Course instructor
- PAL facilitator

Redirecting Questions Back to the Group

To empower PAL participants to do well in courses where no PAL facilitator is available, it is important to redirect questions posed to the facilitator back to the group. The PAL facilitator does not need to pretend to be ignorant, but rather to be part of the team that answers questions and solves problems. Following are suggested phrases to use in redirecting the discussion and questions back to the group:

- Does anyone think that they know the answer to that question? (*The PAL facilitator should carefully observe the nonverbal behavior of participants to see if anyone may have a clue to the question or wish to participate.*)
- Let's look in our lecture notes (*or textbook*) and see if there is information there that can help answer that question.
- Tell me more of what you are trying to find out by your question.
- What do you mean by that question?
- What do we need to know or do next to help solve the problem?

- ❑ Let's define some of the key words and phrases in that question to see if that will help us to answer the question or solve the problem.
- ❑ Who could volunteer to ask this question of the course instructor either during their office hours or ask at the beginning of the next class? (*Use this question only if the PAL facilitator is unsure of the answer to the question.*)
- ❑ Let's break into small groups to work on this question. (*PAL facilitator uses this as an opportunity to engage in small group cooperative learning activity. See elsewhere in this workbook for suggested cooperative learning activities.*)

Improving Higher Order Thinking through More Challenging Questions

While engaging in discussions of the course material, the PAL facilitator can help students to engage at higher levels of cognitive thinking. Not only should the discussion be aimed at a level to prepare students for upcoming unit exams, but also to encourage more rigorous thinking that may be at a higher level.

Bloom's Taxonomy of Educational Objectives (1973) identifies six increasing levels of thinking. With each level, key words are provided to help target questions at that stage of thinking. PAL facilitators are encouraged to help push higher levels of thinking by carefully integrating these words into discussion questions.

Level one: Knowledge (*define, repeat, record, list, recall, name, relate, underline*)

Level two: Comprehension (*translate, apply, employ, use, demonstrate, dramatize, practice, illustrate, operate, schedule, shop, sketch*)

Level three: Application (*interpret, apply, employ, use, demonstrate, dramatize, practice, illustrate, operate, schedule, shop, sketch*)

Level four: Analysis (*distinguish, analyze, differentiate, appraise, calculate, experiment, test, compare, contrast, criticize, diagram, inspect, debate, relate, solve, examine, categorize*)

Level five: Synthesis (*compose, plan, propose, design, formulate, arrange, assemble, collect, construct, create, set up, organize, manage, prepare*)

Level six: Evaluation (*judge, appraise, evaluate, rate, compare, value, revise, score, select, choose, assess, estimate, measure*)

Before the First Class Period

1. Develop your relationship with the course instructor::

- Meet with the instructor to discuss your role as PAL facilitator.
- Identify the expectations of the course instructor for the PAL facilitator.
- Agree on the time and manner to introduce the PAL program on the first day of class.

2. Prepare for the PAL program introduction on the first day of class. The speech should talk between five and seven minutes.

- Make an outline of the speech on large note cards (*i.e., 4"x6" note card*)
- Include key elements to the speech that answer basic questions that students will have: What is the PAL program? What kinds of people come to the sessions? What is your role as PAL facilitator? Why should students be confident in you for facilitating the PAL sessions? What sorts of results occur for students who come to the sessions? What is your role as PAL facilitator?
- Practice giving the speech out loud several times.

3. Obtain handouts needs for the first day of class:

- If necessary, prepare a handout to give to all students about the PAL program
- Obtain from the PAL program administrator the survey to determine student preferences for PAL sessions.

4. Attend training workshops and meet with the PAL program administrator.

Worksheet for Developing First Day of Class Introduction of PAL Program

Develop a speech that takes between five and seven minutes to deliver in front of the class on the first day. Refer to the overview of PAL at the beginning of this workbook or other materials provided by your PAL program administrator to prepare an outline for the talk. Take a few minutes and sketch some ideas that help to answer each of the following questions. Then, break into groups of three and practice answering one or more of the following questions with each other.

1. What is the PAL program? Is this program used at any other colleges in the U.S.?

2. What kinds of people come to the sessions?

3. What is your role as PAL facilitator?

4. Why should students be confident in you for facilitating the PAL sessions?

5. What sorts of results occur for students who come to the sessions? What is your role as PAL facilitator?

First Day of Class

1. Arrive early to class and meet the instructor and find a seat in the front.

2. Distribute the handout about the PAL program to the students. Negotiate with the course instructor when to do this activity (*e.g. as students arrive in class, at same time as oral announcement about the PAL program*).

3. Distribute the survey of students to determine their preferences for PAL sessions during the academic term.

- The PAL program administrator will design the survey to meet the reporting needs of the program.
- Only questions that are essential will be collected. The survey on the following page is only a sample to be customized for local campus needs and the time periods that coincide with the normal times that classes are offered.
- Time sections of the survey would be marked out due to the following reasons: times that the class lectures or labs are offered, times that the PAL facilitator has other unavoidable time conflicts (*e.g., other classes, jobs*).
- Students are asked to only indicate the times that they have unavoidable time conflicts. Otherwise, if students only indicated their preferences, there would be little consensus on when to offer the PAL sessions.

4. Introduce the PAL program to the students in the class.

- Be sure to have previously practiced giving the presentation out loud several times.
- Use large note cards with an outline of your points of the talk as a reminder.
- Make a great first impression with the students. Act in a confident fashion. speak clearly, speak loudly so that everyone can hear you.

5. Collect the survey at the end of the class. Return to the PAL program administrator for scoring and decision making.

PAL Program Survey

Student Name: _____ Date: _____

Course Name: _____ Section #: _____

Weekly PAL program sessions will be offered for students enrolled in this course. This survey determines the most convenient times to schedule these sessions. Responses will be kept confidential and used by the PAL program only. The course instructor will not see these surveys and will in no way be used to influence grading for this course.

Directions: Please fill out this survey whether you think you will attend the PAL sessions or not. Thanks for your participation.

1. On a scale of 1 to 5 (1=no interested, 5=very interested) please indicate your interest in attending PAL sessions for this course.

Circle one: 1 2 3 4 5

2. Have you enrolled in this course before?

Circle one: Yes No

3. Have you ever attending a PAL session before (in this or another class)?

Circle one: Yes No

Directions: Mark with an "X" the hours that you are NOT available to attend.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8 am							
9 am							
10 am							
11 am							
Noon							
1 pm							
2 pm							
3 pm							
4 pm							
5 pm							
6 pm							
7 pm							
8 pm							

Attracting Attendance at Voluntary PAL Sessions

Because of the often voluntary nature of PAL program attendance outside the course lectures, the issue of session attendance will be a continuing issue. A variety of factors can influence the participation rates: academic difficulty perception by enrolled students, percent of students from previous academic terms receiving D and F final course grades and withdrawals, class size, knowledge-level of the PAL program by other students, percent of students living on or near the campus, percent of full-time/part-time students.

While the historic participation rate at many colleges that have implemented a voluntary PAL program has been around one-third of students within the class, there could be wide variances within individual courses. Also, another issue is the number of times that students choose to attend the PAL program. It is important not only to have high total participation rates -- students attending at least one session -- but also that they come regularly. Research suggests that there is a positive relationship between increased PAL program session attendance and higher final course grades.

An exception to this finding is for students who attend 20 or more times per academic term. Research suggests that these students generally would have dropped the course, but persist to the end of the academic term and earn grades of C. With non-math/science majors taking college algebra, occasionally these students may be satisfied with a grade of D since this may be a passing grade for these majors. It appears that these students work hard enough to get the grade they need in this course and then devote their energies to other courses.

Getting off to a good start on the first day. It is assumed that the PAL facilitator has delivered a well-planned and rehearsed first day announcement to the students in the course. While the presentation may be short -- ten minutes -- it will establish the credibility of the PAL facilitator and the program in the minds of the enrolled students. Using data from previous academic terms, it is helpful to report the positive difference in grades for PAL program participants compared with the non-participants. If this is the first time that PAL will be offered in connection with this course, use data from other courses. If this is the first time that PAL has ever been offered on campus, use data from the data base maintained national PAL programs such as the Supplemental Instruction at the University of Missouri-Kansas City (www.umke.edu/cad/si/). It is critical that the first-day presentation goes very well. The SI leader ought to have an outline of the speech on large note cards that they hold as they deliver their short talk. Many SI programs report that also having a one-page overview handout that contains many points made during the presentation is very helpful. A few programs have even developed a short three to five minute video tape with former PAL participant testimonials to help make this first-day presentation even more effective. It might be possible to do a mock PAL session that lasts five minutes or so in the class with the instructor's permission.

Suggested topics for the PAL overview talk with the students during class: what is PAL, why this class has PAL, how PAL works, why PAL works, research on outcomes of C:A attendance (using data from the campus as well as the national PAL data studies), who should attend PAL sessions, what PAL can and can not do, how often students should attend PAL sessions, what happens during PAL sessions, among other possible topics and issues.

Suggestions from other PAL programs. The following suggestions have been contributed by staff from the PAL network from across the globe. The PAL administrator should discuss these strategies with the course instructor ahead of time. Sometimes the course instructor would need to spend additional time or give permission for the activities to occur. The UMKC program uses many of these strategies. Feel free to contribute successful strategies that you develop at your institution. Please send them to UMKC so that they can include them with future editions of this list. Send suggestions to David Arendale, arendaled@umkc.edu

Activities before the beginning of the academic term by the PAL administrator:

1. Give announcements about the PAL program during new student orientation programs. Include information in orientation print literature. This develops an awareness of PAL and they will be more receptive to the first-day announcement given in courses that have PAL.
2. Give announcements about the PAL program during parent orientation programs. They can advocate students to attend PAL sessions during telephone calls during the academic term, especially if students mention challenges with the academic course material.
3. Be sure that all academic advisors are aware of the PAL courses so they can encourage students to enroll in their courses. Provide a schedule of classes that will have PAL support for the academic term.
4. Provide information in the course listing registration booklet concerning the PAL courses and basic information about the program.
5. Some PAL programs report that they preschedule one PAL session meeting time for these courses and list this information in the registration booklet. This gives students an opportunity to schedule their other courses around the PAL meeting time. Often the prescheduled PAL session time is just before or after the course lectures. These times are historically popular with students. The rest of the PAL session times would be scheduled after enrolled students completed the PAL survey on the first day of class.
6. Gain the support of academic tutors, student lab assistants, lab instructors, recitation leaders, graduate teaching assistants, and others to encourage students to attend PAL sessions. Work with them to differentiate the service available through PAL sessions and how it complements and enhances the services provided by the others.
7. Establish an Internet web page that provides information about the PAL program. This can provide times and places for PAL sessions, a forum for on-line chat room PAL sessions, descriptive material about PAL, and a location for interested PAL facilitators to post information about the course (e.g., handouts, text questions predicted).

Activities by the course instructor during the academic term:

1. To encourage attendance, ask the course instructor to prepare mock examination questions and announce to the students that these worksheets -- while available to everyone in the course -- will only be discussed during the PAL sessions. Make copies of the mock examination available in the back of the classroom.
2. The course instructor could post one difficult problem or concept on the blackboard in class and state that this will be discussed during PAL this week.
3. The course instructor regularly (i.e., weekly) gives verbal encouragement for ALL students in the course to attend PAL. It is critical that the instructor not just invites students who are receiving poor grades. If the reputation for PAL develops that it is only for poor students, students will not come to avoid the remedial stigma.
4. Let it be known that the mock examinations developed by the PAL facilitator have been reviewed by the course instructor and that they fairly reflect the types of questions to be expected on the upcoming examination.
5. The instructor could attach a small handout or bookmark to all exam papers to encourage everyone to attend PAL sessions. The PAL Administrator should work with the instructor to design and copy the materials.
6. The instructor could select one or more of the quality examination questions predicted during PAL sessions by the participants to be used on the upcoming examination.

Activities by the PAL facilitator during the academic term:

1. The first day PAL handout should include a comparison of final course grades for PAL and non-PAL participants from previous academic terms for this or similar courses. This handout could be updated throughout the academic term with comparisons of the groups on unit exams.
2. During the second week of class, distribute a short one page handout that summarizes PAL. This can help inform the students who have recently added the course.
3. In PAL sessions, especially during the first two weeks, the PAL facilitator should reiterate how PAL sessions work, the role of the students, and role of the PAL facilitator. As the number of returnees increase, the announcements may be briefer. If new PAL participants attend, the PAL facilitator should share this information briefly again. This helps to reduce unrealistic expectations about PAL sessions that might lead to some discontinuing attendance at further sessions.
4. PAL facilitators frequently create a worksheet for PAL sessions. It could be an empty matrix box, sample problems, etc. The students in the PAL sessions would create the information to put in the worksheet. This is especially helpful in problem-solving courses (e.g., math, science). PAL participants report that they like to have a tangible “take-away” from the PAL sessions. This helps to fulfill that perceived need.
5. Throughout the academic term the PAL facilitator could distribute reminder handouts to encourage attendance and remind students of the meeting

times/locations. These could also give the differences in mean test scores for the PAL and non-PAL participants.

6. Report the number/percent of examination questions (objective or essay) covered during the PAL sessions to the entire class.
7. Include quotations from past PAL participants on how PAL helped them with promotion handouts.
8. Write the PAL schedule on a corner of the black board at before every class session.
9. At the end of each PAL session, remind participants of the next PAL session time and location.
10. As PAL facilitators sit in different locations throughout the room over the academic term, they could take the initiative to personally invite students to attend the PAL sessions.
11. PAL facilitators could announce in class that relevant study strategies will be emphasized at strategic times during the academic term, for example, test taking skills before a major examination.
12. When permissible, use old unit tests in PAL sessions to help students formulate possible test questions for upcoming exams.
13. Provide book marks for the students in the class throughout the academic term. The book marks should include the PAL schedule.
14. PAL facilitators should sit in different places in the classroom to meet new students and be more accessible for questions about the PAL program. This also allows the PAL facilitator to model good lecture note taking strategies for more students in the class who may observe him or her during the class.
15. With the instructor's permission, the PAL facilitator could place a difficult problem or concept on the blackboard and announce to the class that it will be discussed during the next PAL session. The PAL participants would then work to providing an accurate and complete answer to the question.
16. Copies of handouts and mock exams could be made available during class. The PAL facilitator could explain that these were samples of the types of activities that are accomplished during PAL sessions.
17. Create large posters to put on bulletin boards in the classroom and place some in the hallways outside the classroom that remind students of PAL benefits, PAL session times, and PAL session locations.

Activities by the PAL Administrator during the academic term:

1. After the first major examination, the PAL Administrator gather test scores and prepare a one-page report concerning PAL vs. non-PAL test differences back to the class: test score mean, A and B percent rate, and the D, F or course withdrawal rate. The PAL facilitator would distribute the finished handout to the course.
2. If attendance is very low, have the PAL Administrator meet with the class for the last five minutes of a class session. During this time the course instructor leaves the room and the PAL Administrator solicits comments from the students on reasons for low attendance. The PAL Administrator informs the class that if attendance does not improve the PAL sessions will be canceled.
3. With permission from the book store director, one PAL Administrator printed book marks with PAL information and the prescheduled PAL session. The book mark was placed at the end of the first chapter inside the required textbook for the course. At their institution one PAL session is preplanned before the beginning of the academic term. [Usually just before or after a class sessions.]
4. Resurvey the class to see if the initial assignment of PAL sessions is still the best times for the class.
5. If the class has graduate teaching assistants, student lab assistants or the like, solicit their assistance in encouraging student attendance.
6. Create an PAL awareness video tape of three to five minutes to play during the first or second class period of the course. Include comments from former PAL participants.
7. If PAL is offered in several courses each academic term, place an advertisement in the student newspaper listing the PAL schedule. Also, include a short description of PAL or provide comments from PAL participants.
8. If the PAL sessions have not been viewed recently, observe several PAL sessions. While not a pleasant thought to consider, the students may be "voting with their feet" and are not attending the PAL sessions because of something that the PAL facilitator is doing. With the intense time pressures facing many students, they will make quick judgements regarding the value of the PAL sessions. These students will express their views to others enrolled in the course. Research with customer service reveals that when a person has a bad experience, they tell their friends about the incident. Then these people will tell others. Research suggests that each incident of bad service is shared with ninety-seven other people. This reinforces the need for clinical supervision of the PAL program. Is the PAL administrator attending the first six PAL sessions for the academic term? Is the PAL administrator spot checking every week or two throughout the rest of the term?
9. Meet with the faculty member once or twice during the academic term. The more clearly the instructor understand the PAL model, the easier it is for them to see it as something that is worthy of their time and support. They will be more likely to say positive things about the program in class.

10. Ask for a few minutes to share about the PAL program during an academic department meeting. This provides a public forum to share about the PAL program and build more support from the academic department.
11. Advertise the PAL program in the campus newspaper. This helps to build a public support for the PAL program and that it can be beneficial for all students.

Activities after the academic term:

1. Review the criteria for selecting this course originally. Sometimes the reason for low attendance is that students do not perceive this course as difficult. Check to see if about 30 percent or more of the students are receiving final course grades of D and F or are withdrawing from the course. If the general impression by enrolled students is that most students receive passing grades, even academically under prepared students may think that they may survive the course since nearly everyone else is passing. While the course may be perceived to be difficult by faculty members, academic advisors or department chair persons, the most important perception is the one held by the students enrolled in the course. While the 30 percent D/F/W guideline is not mandatory for success in all courses where PAL is offered -- perhaps PAL is being offered for only a subpopulation of students in the course -- this guideline has often identified courses that enrolled students would also identify as historically difficult for any student who is in the course.
2. If the class has graduate teaching assistants, student lab assistants or the like, see if students attended their sessions instead of attending PAL sessions. On a few rare occasions, these individuals have offered activities that looked similar to PAL sessions. If they do -- which is a pleasant compliment -- you may need to discontinue PAL in this course due to duplication of service. When given a choice, students may go to graduate teaching assistants instead of PAL sessions -- especially if the GTAs also serve as graders for the course instructor.

Principle Three
Modeling Productive Learning Behaviors

These cognitive learning strategies are used during PAL sessions so that individual students adopt them for use by themselves at a later date.

<p>3. PAL Facilitator and participating students model productive learning behaviors that students adopt and adapt.</p>	<p>A. Both PAL Facilitator and session participants share strategies that are personally helpful..</p> <p>B. Relate learning strategy directly to content and materials.</p> <p>C. Connections are made between the current course and the next one in the sequence or other courses within the major.</p> <p>D. Identify the most important information and concepts in the course.</p> <p>E. Look for “<i>teachable moments</i>” within the session to use a learning strategy in connection with course material.</p> <p>F. Preplan the use of a rotating set of learning strategies on the PAL session planning form.</p> <p>G. Keep these activities short and directly tied to the course material.</p>
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List of activities:

1. Lecture Review
2. Oral Reading of Lecture Notes
3. Building Readiness for Learning
4. Examination Preparation
5. Visual Strategies
 - a. Mind Map
 - b. Outline Map
 - c. Continuum Line Map
 - d. Matric Map
 - e. Time Line
6. Vocabulary Development
7. Reading Textbooks and Assigned Materials
8. Modeled Study Skills
 - a. Note Taking
 - b. Note Cards
 - c. Mnemonic Devices

Lecture Review

Description: A review of one or more of the lectures delivered by the instructor in the past week. This does not necessarily need to be the last lecture if the review session occurs immediately afterwards to provide

Purposes:

1. Review the instructor's recent lecture.
2. Help students to separate the lecture material: important concepts, illustrations, and other material. Some students act like stenographers in class and record everything equally, but have difficulty sorting out the most important material to study for future examinations.
3. Expose students to different methods of note taking (e.g., *Cornell Method, mind mapping*).
4. Through the group discussion, allow students to self-discover their level of note taking in comparison with others. This provides an encouragement to modify academic behavior regarding taking better notes since some are recording material missed by the student.
5. Provide opportunity to see linkage of the lecture with the textbook, outside readings, previous lectures, student prior knowledge, and anticipated future lectures. This leads to higher comprehension of the new material.
6. Help students to discover the organization pattern for the lecture and therefore make it easier to learn the material.

Procedures and Examples: *(After the facilitator has directed the students to quickly silently read their lecture notes of the designated day in class, choose one of more of the following activities. Rotate their use throughout the academic term.)*

1. Ask the group to generate a list of the main topics from the lecture. Then ask students to take several minutes to review their lecture notes concerning the topic. Following that, the group facilitator leads the group in a more in-depth discussion of the topic.
2. Facilitator asks for a volunteer to go to the board and serve as recorder for a list of new vocabulary words and terms contributed by the group. Suggest that students record the list in their lecture notes.
3. Group discussion that establishes connections between the current lecture with previous lectures, previous and current assigned readings, and student prior knowledge.
4. When the facilitator notices that someone is employing some unique note taking systems, ask them to share their strategy with the group. The group facilitator throughout the term should employ different methods (e.g., *Cornell, mind mapping*) of note taking and share them as a model as well.

5. Especially after a lecture early in the academic term that was very challenging, the facilitator could photocopy one or more pages of their notes to share with the group as a sample. This is especially helpful in math classes where some students have great difficulty in taking effective notes over both the lecture as well as material copied onto the board by the instructor. *Cautionary note: group facilitators should never regularly copy their notes for students or loan them out for others. Instead, redirect the request back to the group and ask for a volunteer. If necessary, tell the student that you are prohibited from distributing your lecture notes.*
6. Share with students an incomplete outline handout of the lecture. The handout would have the major and some of secondary points in the lecture with space to add more information. This is a useful activity sometimes at the beginning of the academic term to help students see patterns in the instructor's lecture.
7. Have students create for themselves an outline of the lecture. Ask a member of the group to go to the board and serve as recorder for the group. This is especially helpful after an especially challenging lecture.
8. Facilitator asks students to summarize the lecture at the end of the review session. This could be done through by asking each to write one paragraph in their notes and asking for several volunteers to share what they wrote with the group.

References and Suggestions for Further Investigation:

Oral Reading of Lecture Notes

Description:

Each student is asked to read aloud a portion of their lecture notes for other members of the group.

Purposes:

1. Through the group activity, allow students to self-discover their level of note taking in comparison with others. This provides an encouragement to modify academic behavior regarding better note taking since some group members are recording material missed by some students.
2. Increases awareness of the amount of information communicated throughout the class session, important announcements at the beginning and end of class, and various means that information is communicated (*e.g., oral lecture, board work, audiovisual presentations, handouts, group discussion*).
3. Students can fill in gaps of their lecture notes by listening to contributions by others in the group.

Procedures and Examples:

1. The facilitator reminds the group about the procedures for the activity. One of them is that group members are given permission to “pass” and not read aloud. Gently encourage everyone to participate, but recognize that some will choose not to read aloud due to different reasons: fear of revealing their academic weakness regarding note taking; missing class that day; cultural sensitivity issues regarding speaking in front of people of other cultures and genders; speech disabilities; or other personal reasons.
2. The facilitator models the activity by being the first to read from their lecture notes. The facilitator’s lecture notes should have recorded all announcements given by the instructor at the beginning of class, all material written on the board or presented through other audio-visual means, the lecture itself, through final announcements given during the last minutes of class. Read for about a minute or two and then pause and ask the group if anything needs to be added to the notes.
3. Then the next person to read is located immediately to the left or right of the facilitator. The person begins at the next place in the lecture notes and continues for several minutes.
4. The group is then asked if anything needs to be added. Group members are encouraged to add new material from their lecture notes that was not read by the student. To encourage others to share, the facilitator should be the last one to make a contribution.
5. After a student has read their notes and said something which is incorrect from the facilitator’s notes, wait for a moment to see if another student challenges. If no one else responds, the facilitator should not directly challenge the student but gently state that, “I didn’t have that in my lecture notes.” The facilitator would then ask if

anyone else in the group had written similar material in their notes. To resolve the difference of opinion, consult the textbook, outside readings, and the lecture notes of the group. To support increased autonomy and self confidence of the group members, the authority for the discussion cannot be the expertise and prior knowledge of the facilitator, but rather the individual student, knowledge gained through the group and use of the textbook. It may be necessary to resolve the issue by one of two means: (1) asking a group member to ask the instructor privately and to report the resulting conversation back to the group; (2) ask a group member to ask the instructor during the next class period. Facilitators should not be placed in a position of acting on behalf of the group to talk with the instructor.

6. The next person seated beside the student is encouraged to continue in a like fashion.

References and Suggestions for Further Investigation:

Building Readiness for Learning

Description:

Students engage in activities to prepare them for future lectures and reading assignments.

Purposes:

1. Helps to activate prior knowledge about the upcoming topic, making it easier to learn the new material since they can connect it with information they already understand.
2. Future lectures and textbook readings are easier to learn if students are familiar with the new vocabulary terms that will be introduced at that time.

Procedures and Examples (*select one or more of the following. Rotate use of the strategies throughout the academic term*):

1. At the end of a session, the group facilitator asks students to make predictions about the topic and direction of the next lecture and material in assigned readings.
2. Ask for students to share what they already know about the upcoming topic. This helps to build a bridge to the new material by connecting with prior knowledge of the student.
3. Take a minute or so at the end of a session to skim the upcoming chapter to identify the main topics (*generally in bold type*) and key vocabulary words (*sometimes noted in a list at the beginning or end of the chapter*).

References and Suggestions for Further Investigation:

Examination Preparation

Description:

Activities to prepare students for major unit examinations.

Purposes:

1. Help students to see that effort and time invested in preparation can enable them to earn higher grades on examinations.
2. Potential questions on the examination can be reasonably predicted from review of the lecture notes and assigned readings.
3. Students can begin to think like instructors' think concerning what academic content from the course is most important.

Procedures and Examples:

1. Identify the calendar for all course assessments from the course syllabus. The calendar of upcoming examinations and homework assignments is regularly noted in review sessions.
2. Review whether the instructor has placed past examinations on file at the campus library. If so, copies of the examination could be reviewed during the review session.
3. Identify the types of questions that will appear on the examinations and discuss strategies to deal with each type of question: essay, multi-choice, true/false.
4. Take a few minutes at the end of each review session for the students to generate two or three potential examination questions based on the lecture. Encourage students to leave extra room at the end of their lecture notes so that there is space for a summary paragraph and potential examination questions to be added by the student later. The facilitator could keep a running list of these potential questions generated by the group and distribute them before the next major unit exam.
5. During each review session the group identifies the new vocabulary words that are introduced during the lecture. The facilitator could then compile the list and distribute it before the next major unit exam.
6. A mock examination is administered before one or more of the major unit examinations:
 - a. The mock exam is created by the facilitator. Questions could be those generated by the group (*see #4 above*) and the facilitator.
 - b. The mock exam has representative question types that may appear.
 - c. Time should be split in the review session so that the mock exam can be completed and then time provided to debrief and discuss the exam. Suggestions can be provided concerning strategies for test taking.

- d. So that students can preview the time pressure on the real examination, the number of questions that appear on the mock exam push students to complete them within the time provided.
- e. Following the mock exam, the facilitator leads the group in debriefing the experience by describing the strategies used to read and respond to the questions, strategies for dealing with test anxiety.

The following information about examinations might be used by the facilitator during the debrief of the mock exam or the post exam review. It could be printed as a handout for distribution or posting to a web page.

General Test Strategies:

1. Carefully read the directions for the exam before beginning.
2. Make a plan to budget time for each part of the exam.
3. Carefully read each question. Mistakes are often made by rushing through exams. If you have permission to mark on the exam, underline key words in the directions and questions if it helps you to focus on the statements.
4. Use the information provided in one part of the exam to help answer questions in another part. For example, use vocabulary words, definitions, and answers to multi-choice questions when providing additional supporting information with essay questions.
5. When making an educated guess at a question that you are unsure, do not go back and change it later.
6. Be sure to respond to all questions unless points are deducted for incorrect responses.
7. Allow time at the end of the exam to check for completion of all questions.
8. Take the entire test taking time to complete the exam, extend essay responses, and check your answers.
9. If you have a diagnosed learning disability that has an impact upon your test taking skills, request an accommodation from the school to take the exam under alternate conditions. This is not seeking an advantage, rather to assure that all students have an equal opportunity to do well on an exam.

Multiple-Choice Exams:

1. Carefully read the question stem (*keep potential answers covered with hand*).
2. Identify what the question is asking. (*underline key words or phases if it helps you*).
3. Focus on understanding the question, not just identifying the correct answer.
4. Restate the question into your own words and interpret its meaning.
5. Predict an answer without looking at keyed responses.
6. Look at the potential responses and notice if any of the options permit selecting more than one correct answer (*e.g., all of the above, b and c, all except answer a*). This is especially important in case the first answer option is correct and you are tempted to select it immediately and then stop reading the options and go on to the next question.
7. Pay attention for special question words (*e.g., not, all except*). If question has this format, write a T for true and F for false beside each answer option to make question easier. Then select the answer option with the F beside it. Watch for multiple answer options (*see suggestion #6 above*).
8. Never be afraid to use common sense in determining your answer. Most instructors do not design questions to be intentionally difficult and confusing.
9. Unless there is a strong and logical reason, do not change answers.
10. If all of the above suggestions do not help and you are still clueless, guess at an answer and move on to the next question. Budget your time and do not waste time on only a few questions.

Matching Exams:

1. Determine the pattern of the matching questions (e.g., people with quotes, words with definitions, events with descriptions)
2. Choose the longest column to read first. It will provide the largest amount of information and clues for matching with the shorter column.
3. Make it easier to complete the questions by eliminating items already answered. Cross out the items used from both columns as you complete them.

Essay Exams:

1. Quickly scan through the whole test first to allow you to budget your time for each section.
2. Answer the questions you know best first.
3. Read the instructions to each question carefully.
4. Take time to structure your answer if it is an essay question. Take 15 to 30 seconds to outline your answer on the back of the exam page.
5. Come straight to the point in your answer and provide supporting detail and evidence to support your conclusions. Build a case with supporting information.
6. Use the information provided in other parts of the exam to help answer the essay questions. For example, use vocabulary words, definitions, and answers to multi-choice questions when providing additional supporting information with essay questions.
7. Take time at the end to reread the exam to check for unanswered questions or to add more detail for essay questions. Never leave an essay question blank. If you miscalculated on time, write an outline of your answer and indicate that you ran out of time. Perhaps you will receive partial credit for the question.
8. Qualify answers when in doubt. Show the instructor why you are taking the position on the answer.

Key words on exams:

1. *Compare*: examine qualities, or characteristics, in order to determine resemblances.
2. *Contrast*: stress dissimilarities, differences, or unlikeness of associated things.
3. *Criticize*: express your judgement with respect to the correctness or merit of the factors under consideration
4. *Define*: write concise, clear, authoritative meanings.
5. *Discuss*: examine, analyze carefully, and present considerations pro and con regarding the problem or item.
6. *Enumerate*: a list or outline form of reply. Recount, one by one, in concise form, the points required.
7. *Evaluate*: present a careful appraisal, stressing both advantages and limitations.
8. *Explain*: clarify, elucidate, and interpret the material you present.
9. *Illustrate*: present a figure, diagram, or concrete example.
10. *Interpret*: translate, exemplify, solve or comment upon the subject, and, usually, give your judgment or reaction.
11. *Justify*: prove your thesis or show grounds for decision.
12. *List*: present an itemized series or a tabulation.
13. *Outline*: give main points and essential supplementary materials in a systematic manner.
14. *Prove*: establish something with certainty by citing evidence or by logical reasoning.
15. *Relate*: emphasize connections and associations.
16. *Review*: analyze and comment briefly, in organized sequence the major points.
17. *State*: express the high points in brief, clear form.
18. *Summarize*: give in condensed form the main points or facts.
19. *Trace*: give a description of progress, sequence, or development from the point of origin

References and Suggestions for Further Investigation:

Visual Strategies

Description:

Employing visual organizers with academic content material.

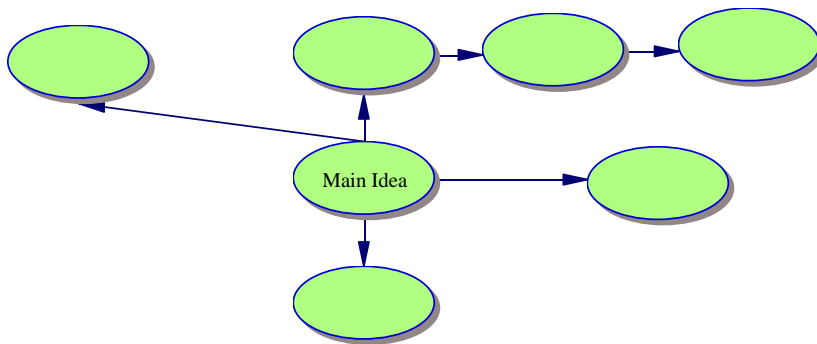
Purposes:

1. Students retain information longer if they can see visual relationships among separate pieces of information by developing a schema, an overarching organizational device.
2. Provide easier method for studying academic content before major examinations.

Procedures and Examples:

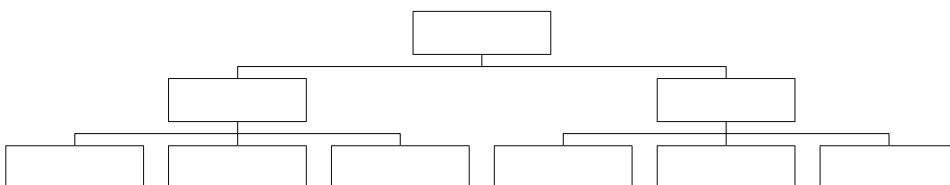
1. A **mind map** is an organizer in which the central concept of the lecture is placed in the middle of the page. Like a spider web, each point made during the lecture is arranged on the page based on its relative relationship with the central concept.

Sample Mind Map:



2. An **outline map** arranges information into an organization that descends in a logical sequence from primary, secondary, and tertiary information.

Sample Outline Map



3. A **continuum line map** arranges information into a sequence. Rather than a time line that displays information chronically, this map displays items in their relative relationship to one another.

Sample Continuum Line Map: Positions of Theorists on Basic Human Nature Assumptions

[Freedom] ----- Maslow —Rogers -----Freud ----- Skinner -- [Determinism]
 [Good Nature] -----Rogers ---Maslow ---- Freud ----- [Evil Nature]
 [Environment Controls] -- Skinner ---Erickson --- Freud ---- Jung ----- [Heredity Controls]

4. A **matrix map** is useful when there are several categories of information that can be compared among multiple topics. In addition to allowing for more rapid learning of the material, matrix charts can be used for to prepare for examinations. Much like the television game show, Jeopardy, each box of information can be turned around into a question. Also, the creation of comparison and contrasts in the matrix box provides structure that often makes more powerful essay question responses. At the beginning of the academic term the facilitator can take more guidance in helping the group to create matrix boxes to organize lecture or textbook information. The facilitator may suggest the organization of the rows and columns and help the group locate the needed information to complete the matrix in the lecture notes and textbook. At the academic term progresses, it is better for the facilitator to sometimes prompt the group to create a matrix, but to let the group struggle with how to create the matrix. This leads to independence for group members when they must create such structures by themselves.

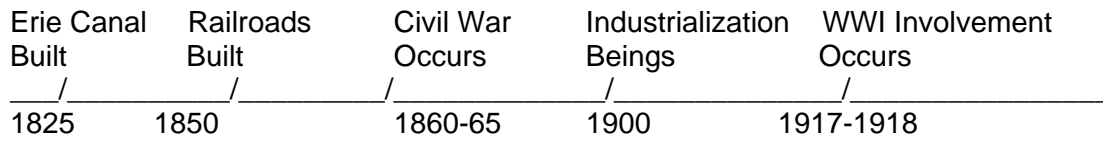
Sample Matrix Box: Examining the Muslim Empires

	Ottoman Empire	Savavid Empire	Mughal Empire
<i>Political Organization</i>			
<i>Religious Toleration</i>			
<i>Foreign Relations</i>			
<i>Economic Policies</i>			

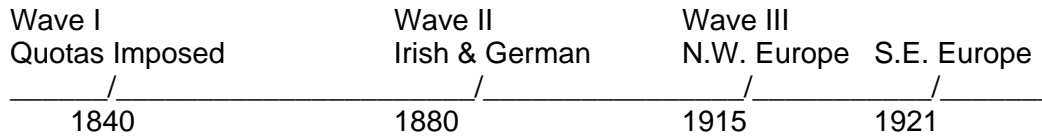
5. A **time line** can display a continuum of events or ideas over a period of time. This activity should only be employed in review sessions when it is certain that this level of detail is necessary for exam preparation or for more deep mastery of the academic content. On the board in the room someone can draw a line along the top end of the board and important dates and short descriptions of events can be contributed by the group. To show comparisons, two or more horizontal lines might be drawn next to each other with each representing events within another country. Time lines can also be helpful for connecting with previous course material and predicted future events to cover in the course.

Sample Time Line: Comparing U.S. Events and Immigration Policy

Time Line #1. U.S. Events



Time Line #2. European Immigration to the U.S.



References and Suggestions for Further Investigation:

Vocabulary Development

Description:

Developing mastery of the technical language used in the course.

Purposes:

1. Identify the key technical terms in the lecture notes and assigned readings.
2. Understand the relationships among key terms.
3. Use the technical terms appropriately and precisely during review sessions rather than paraphrasing them in other words.

Procedures and Examples (*Select one or more of the following activities*):

1. At the beginning of the review session, the group identifies the new vocabulary terms in the lecture. The facilitator writes the words on the board.
2. The facilitator ensures that the group uses their lecture notes or the textbook to provide a short definition for each of the new words written on the board. This could be done in one of several ways:
 - a. group activity where each word is defined;
 - b. break group into smaller units to answer part of the word list and then report back to the large group;
 - c. each student is given one word to define and then report back to the large group;
 - d. the words are defined as they are encountered throughout the review session.
3. The facilitator monitors the group discussion and prompts group members to precisely use the technical language presented during the lecture or contained in the textbook.

References and Suggestions for Further Investigation:

Reading Textbooks and Assigned Readings

Description:

Strategies to increase comprehension and mastery learning of topics in textbooks and assigned readings.

Purposes:

1. Facilitator can demonstrate value of the readings by referring to and using them during review sessions.
2. Explore textbook elements that can be used to increase comprehension and prepare for examinations.
3. Strategies for identifying the most important material to review for examinations.
4. Connect reading assignments to lectures and activities in the classroom.
5. Increase readiness for lectures by encouraging students to read ahead in their assigned readings.

Procedures and Examples (select one or more of the following. Rotate use of the strategies throughout the academic term):

1. The facilitator always brings the textbook and assigned readings to both use for group activities as well as to demonstrate that the materials are valuable.
2. Early in the academic term, the facilitator surveys the textbook to point the group to sections that may answer specific questions.
 - a. Chapter elements: topical outline, vocabulary lists, headings embedded within the text, listed potential essay questions
 - b. Book elements: table of contents, vocabulary glossary of key terms, topical index of key words with page numbers (*to more quickly locate information*)
 - c. Web-based resources: flash cards, study guides
3. Preview upcoming course topics by skimming the assigned readings before the lecture that is connected to it. Make predictions of what topics will be covered by the upcoming lecture.
4. Early in the academic term the facilitator can lead the group to create a study guide for the assigned reading. Using elements from the textbook as the guide, identify key vocabulary terms, create an outline of the topics, and predict some potential examination questions.
5. Discuss the connections between the assigned readings and the lecture notes.
6. Compare notes taken over the assigned readings. (*See the note taking section for suggestions.*)
7. Analyze selected charts, graphs, and diagrams in the readings. Many students skip these elements when quickly reading. Often the instructor will assume that students

have read and understood these elements in addition to the reading narrative section.

References and Suggestions for Further Investigation:

Modeled Study Skills

Procedures:

1. The facilitator watches for “*teachable moments*” when they can quickly share a study skill that has worked for them. This could take anywhere from 15 seconds to perhaps a minute.
2. The facilitator needs to intentionally plan to use as many of the study skills throughout the academic term, even though some have not been used before. It is important that the facilitator have personal experience with using the study skill in the same class along with the other students. Other students are more likely to experiment with the specific study skill if they see that the facilitator has successfully used the skill themselves and can validate its usefulness from personal experience.
3. After the facilitator has shared about use of a specific study skill, the facilitator should also encourage others in the group to share their experiences with this or other study skills. This encourages them to see that there is a wide variety of study skills available for use. The key is matching the study skill or strategy to the demands of the specific learning task.

List of activities:

1. Note Taking (*Lecture or Assigned Readings*)
 - a. General Procedures
 - b. Cornell Method
 - c. Mind Map Method
 - d. Method for Courses With Extensive Board Work
2. Note Cards
3. Mnemonic Devices

Note Taking (*Lecture or Assigned Readings*)

Description:

There are several different note taking systems that can be employed.

Purposes:

1. Provide different note taking models for students to adopt and use, depending upon the organization and presentation style of the lecture or assigned reading.
2. Encourage students to take notes over assigned readings as well as lectures.
3. See the utility of using note taking strategies to prepare for examinations.

Procedures and Examples:

There are several major styles of note taking. Following a general overview, the procedures for each of several note taking strategies is shared. The facilitator is encouraged to employ each strategy throughout the academic term so that they can show students what the written notes look like during sharing opportunities.

General procedures:

1. Use a full-sized, three-ring notebook to contain the notes since other course materials can be three-hole punched and integrated together (*e.g., syllabus, lecture handouts, notes over textbook with notes from lectures*). In case a lecture or handout is missed, it can be easily integrated into the appropriate location in the notebook.
2. Date and number the note pages to make it easier to locate material.
3. Provide lots of blank spaces (*one to two inches*) between major points in the lecture to allow for adding more material after a review session, writing potential exam questions, notes from the textbook, or adding visual organizers later.
4. Begin taking lecture notes as soon as the instructor begins to speak in class until the instructor ends the session. Sometimes important material is given in the first and last minute of class.
5. Take lecture notes on both what the instructor says as well as what is written on the board.
6. Use only one side of the page when writing notes. When reviewing the notes later in the notebook, the back of the previous page (*left side*) will be blank. Additional notes and diagrams can be easily added to this blank page to accompany the notes on the right hand side.
7. Review notes within one or two hours afterwards. This gives an opportunity to fill in missing information and to reinforce learning of the material. Review notes again on a weekly basis to increase retention of the material.
8. When reviewing lecture notes, predict potential examination questions. Write potential questions in either the left hand side of the page (*e.g., Cornell Method*) or at the end of the lecture notes for the day. See strategy on "*Examination Preparation*" for more suggestions.

Cornell Method of Note Taking:

1. With regular note paper, draw a vertical line three inches from the left margin. Sometimes you can purchase note paper already printed in this fashion. Sometimes it is called “law-ruled” paper due to its popularity for students in law school.
2. Write notes only on the right hand side of the page. See “*general procedures*” above for more suggestions.
3. After taking notes (*from class or over the assigned reading*), use the left hand side of the page to record key words or phrases about the notes located directly to the right.
4. When reviewing the notes, cover up the right hand side of the page and try to remember the meaning of the word or phrase located on the left hand side. Then uncover the right side. If the prediction was correct, move down to the next word or phrase. If the prediction was incorrect, study the material on the right hand side more before proceeding to the next item.

Mind Map Method of Note Taking:

This strategy is especially effective for students who are very visual learners. It is also helpful for lectures or reading material that does not have an apparent organization structure.

1. Write the main point of the lecture or reading material in the middle of the page.
2. Like spokes on a wheel or a spider web, arrange all other information from the main point.
3. Each major supporting item is drawn on a line from the central point.
4. Illustrating information for each point is drawn as lines for that particular point.

Lecture Notes When Board Material Not the Same as Spoken by Instructor:

There is a temptation for some students in classes, especially mathematics, to only take notes on what the instructor writes on the board and not on the oral material delivered which may be different (*i.e., problems are written on the board but the oral presentation is on the procedures and other content material.*)

1. Employ any of the previous methods of note taking. Take notes on the page located on the right hand side of the notebook.
2. Reserve the page located on the left hand side of the notebook for all board work by the instructor.
3. Draw lines or arrows to show connections between material written on the left and right hand pages.

References and Suggestions for Further Investigation:

Note Cards

Description:

Recording key course information on small cards that can be frequently carried and reviewed by the student.

Purposes:

1. Provide an effective and portable method to remember key words or phrases with their accompanying definitions, explanations, and examples.
2. Maximize wait time by using easy to carry note cards to review material.
3. Increase retention of material by frequently reviewing and studying throughout the week when the course notebook is not available.

Procedures and Examples:

1. Using 3 x 5 cards, on one side write the question or the key word/phrase, and on the other side write the definition, explanation, and or example.
2. Carry the cards throughout the academic term. File cards that are unneeded after examinations.
3. Use wait time (*e.g., riding, waiting for the next class to begin, breaks at work*) to review the material.

References and Suggestions for Further Investigation:

Mnemonic Devices

Description:

A memory aid for making to remember information or steps to a process.

Purposes:

1. Mnemonic devices are more efficient than rote memory techniques (*learning by simple and frequent repetition*).
2. More quickly memorize the information since a pattern is presented to attach the new information.

Procedures and Examples:

1. **Jingles** are created by remembering information that is attached to part of a melody or song. For example: (1) days in the month, “*thirty days hath September, April, June, and November.*”
2. **Acronym (catchword)**: a single word that prompts memory of a series. For example, “*HOMES*” represents the Great Lakes: Huron, Ontario, Michigan, Erie, and Superior.
 - a. Identify the information to be learned.
 - b. Underline the first letter of each word.
 - c. Create a word or phrase that uses each letter underlined above.
 - d. Memorize the acronym or acrostic created.
3. **Acrostics (catchphrase)**: a phrase that prompts memory of a series of words. For example, “*my very educated mother just served us nine pickles*” represents Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto.

References and Suggestions for Further Investigation:

Principle Four
PAL Sessions in the Content Areas

The unique demands of each academic discipline often requires different approaches to learning.

4. Sessions in various academic content areas are different based on the academic requirements unique to them.	A. PAL sessions appear and operate different in various academic content areas. B. Review PAL strategies from the manual and customize for use in the particular course. C. Factors that require different approaches for various academic disciplines: problem-solving, vocabulary, reading requirements, memorization, concept learning and synthesis among concepts.
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Four Major Demands:

1. Problem-Solving Courses
2. Humanities Courses
3. Writing Intensive Courses
4. Social Science Courses

Mathematics & Other Problem-Solving Classes in the Sciences

Description:

Problem-solving courses such as chemistry, physics, or mathematics share several common traits that pose challenges for students, especially those who are not pursuing an academic major in the area. One issue is that there is a well-defined process for solving for the one “correct” answer. Many students never completely understand the logic of the process for problem-solving since they are preoccupied only with discovering the correct answer through any means.

Purposes:

1. Students learn how to reduce rather than elaborate information. Humanities courses often seek to elaborate on the available information. In this situation, probing for more complexity and alternative, multiple answers is often a goal. Science classes often have a goal to reduce, simplify, or solve for the “correct” answer. Common words in problem solving courses are “*reliability, verifiability, clarity, empirical evidence, natural law, research methods.*” This difference in perspective is sometimes quite difficult for students who are not majoring in the humanities.
2. Develop reductionistic thinking processes so that students can systematically understand the problem-solving process, solve complex problems, and arrive at the correct answer.
3. Understand the demands of the problem to be solved and the ability to select the appropriate means to solve.
4. Give multiple opportunities in each review session for students to self test themselves regarding the course material so that they can immediately ask questions of the group to clarify and understand.

Procedures and Examples:

1. The facilitator should almost never go to the board to illustrate a point or to solve a problem. It is vital that the students in the group be the ones to serve as scribe for the group or to solve a problem. It is too tempting for the facilitator to “*help*” the students by solving the problem and slipping into a teacher authority mode.
2. Establish clear roles for the student who volunteers to serve as a scribe at the board: (a). The scribe can choose to say nothing and only record what the group wants written. If they want to participate, they are allowed as long as they do not begin to lecture. (b). Rotate the student scribe at the board frequently so that they have a chance to rejoin the group and edit their lecture notes as the discussion proceeds.
3. If the group is small enough, send all students to the board to work on problems and then to compare both the process and product of their work.
4. Encourage the group members to share their thinking process that they used in solving the problem.

5. Spend several minutes at the beginning of the review session on key vocabulary terms essential for solving the problems. Some students do not readily acknowledge their lack of understanding. The facilitator may want to model use of note cards (described elsewhere in this manual) to help memorize key definitions and problem-solving procedures.
6. At the beginning of the academic term, it may be useful to talk about note taking strategies in classes which the instructor may write on the board the problems to be solved but no written material is on the board concerning the detailed oral lecture delivery. (*See note taking strategies in this manual.*)
7. Be clear about following rules concerning not working on assigned homework problems that are graded.
8. Rather than allowing students to focus on solving obscure home work problems that they may request solving during the review session, it is generally best for the facilitator to develop ahead of time a work sheet with a good selection of problems that represent the different areas that need to be mastered by the students. (*See item below for more ideas about worksheets.*)
9. The facilitator should work out solutions to the problems on any review session distributed worksheets ahead of time. This will help them guide students in solving the problems. It also reduces the potential stress on the facilitator and potential for losing credibility with the students if solved incorrectly in front of the group. This is why it is best for the facilitator to obtain volunteers to go to the board and have the group work together on solving problems.
10. A systematic chalk board model for solving problems can provide the structure that some students need to have a clear visual understanding. The selection of problems is generally selected ahead of time by the facilitator to ensure that they are representative and also that the facilitator has already solved them. The focus is on the deep mastery understanding of the process of solving problems, not the quick repetition of identifying correct answers to a large number of problems.

Chalk Board Model of Problem Solving

Examples Problem to Solve: $x + 2x = 16$			
Prerequisite Information	Steps in the Solution Process	Rules for the Steps	Similar Problems
This first step includes relevant equations, formulas, chart, and general information for solving this type of problem.	The facilitator and the group identifies the step by step method to solve the problem.	A narrative description is written on how to solve the problem.	Students check for understanding by solving similar problem types.

11. While worksheets are a common activity in problem-solving classes, sometimes it is overwhelming for students to focus on all the elements of solving the problem. The following suggested worksheets focus on one element of the problem-solving process. Rather than only working on three to five problems in the review session, these worksheets are designed for students to complete one task with five to ten problems. Following completion of this type of worksheet activity, then the group may be better prepared for solving complex problems.
- First Step Worksheet.* These worksheets list five or ten equations to solve. The student is asked to write down the first step to take in solving the problem that might require three to eight total steps. Sometimes this is the barrier for students solving equations, selecting the first step.
 - Converting Word Problems to an Equation.* The student is asked to simply write down the numerical equation that needs to be solved based on the word problem. The group then shares the equation that they create. In addition to this essential task to solving the equation, it also provides a reading comprehension activity to help students self-discover if they are inaccurately reading the narrative.
 - Converting Equations to Narrative.* Just as in the above example, the translation process between numbers and words can be very difficult for some students. Having students take a list of equation problems and having them write out in words what is required provides insight to them whether they really understand what is being required, or if they are trying to only imitate the process without understanding.
 - Writing the Procedure and Formulas.* In this worksheet, students only are required to write down the steps needed to solve a list of equations. There may be more than one set of procedures needed for the list. Then, the group can discuss their list, check for completeness with each other's lecture notes and compare with the textbook. This also provides an opportunity to explore is there is more than one procedure for solving and encouraging students to see the multiple options available to them.
 - Predicting Exam Questions.* A list of problems are provided and students are asked to write down why the instructor might select them for an exam. The group discussion helps to develop an understanding of the course instructor's thought

process on question selection and helps them to see that the examination writing process is not random, but predictable.

References and Suggestions for Further Investigation:

- Ainsworth, L., Garnett, D., Phelps, D., Shannon, S., & Ripperger-Suhler, K. (1994). *Mathematics: Needs and approaches using SI*. Retrieved from <http://www.umkc.edu/centers/cad/si/sidocs/lamath94.htm>
- Congos, D. (1993). *A model for Supplemental Instruction in introductory chemistry*. Retrieved from <http://www.umkc.edu/centers/cad/si/sidocs/nlchm196.htm>
- Congos, D. (1997). *SI models for introductory chemistry and physics*. Retrieved from <http://www.umkc.edu/centers/cad/si/sidocs/dcphys97.htm>
- Lockie, N. M., & Van Lanen, J. J. (1994). *SI for college chemistry course*. Retrieved from <http://www.umkc.edu/centers/cad/si/sidocs/jbchem94.htm>
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- Kenney, P. (1990). *Suggestions for math SI sessions*. Retrieved from <http://www.umkc.edu/centers/cad/si/sidocs/pkmth197.htm>
- University of Texas-Austin. (2003). *Suggestions for peer learning groups in the natural sciences*. Retrieved from <http://www.utexas.edu/student/utlc/si/simannual14ns/simannual-tblcon-ns.html>

Humanities

Description:

Reality is viewed differently in the humanities in comparison with other academic disciplines, especially the sciences. Often the courses seek to expand knowledge and seek alternative explanations for reality. This poses challenges for many students.

Purposes:

1. Students learn how to elaborate rather than reduce information. Science classes often have a goal to reduce, simplify, or solve for the “correct” answer. Humanities courses often seek to elaborate on the available information. In this situation, probing for more complexity and alternative, multiple answers is often a goal. Common words are “*ambiguity, uncertainty, intuition, insight, self-knowledge.*” This difference in perspective is sometimes quite difficult for students who are not majoring in the humanities.
2. Develop expansive thinking processes.
3. Enhance writing skills required for essay examination questions and completion of papers.

Procedures and Examples:

1. Introduce visual organizers such as mind maps and matrix boxes. Many humanities classes and assigned readings have few illustrations and organizers. This helps visual learners who crave such tools to help see the relationships between ideas and words. (See “*visual organizers*” strategy for more detail.)
2. Vocabulary activities are very important since humanities courses focus heavily on the use of language (See “*vocabulary activities*” strategy for more detail.)
3. Writing assessments are frequently the major means for course grades and demonstrating content competence. Taking time in review sessions to work on practicing for examination essay questions and taking steps to complete research papers is an important activity. (See “*writing intensive courses*” for more detail.)
4. Discussion activities that help students explore multiple interpretations of the material and multiple solutions. This is very challenging for dualistic thinkers who look for the “*right*” and “*wrong*” answers.
5. More careful attention needs to be placed on reading assignments. Not only is it important to understand what has been said in the text, but also who said it, who they are as a person, and why they said it. Interpretation of the people, events, and interactions are important.
6. Short writing activities where students write on an issue could be useful. Graded writing assignments in humanities courses often focus not only on containing the “correct information,” but also an expectation that the student express some original thought in the assignment. Sometimes instructors will welcome controversial and opposing positions on issues if the student is able to support the ideas with strongly developed arguments with supporting information.

References and Suggestions for Further Investigation:

- University of Texas-Austin. (2003). *Suggestions for peer learning groups in the liberal arts*. Retrieved from <http://www.utexas.edu/student/utlc/si/simannual14ns/simannual-tblcon-la.html>
- Zerger, S. (1994). *Supplemental Instruction in the content areas: Humanities*. Retrieved from <http://www.umke.edu/centers/cad/si/sidocs/jbhum194.htm>

Writing Intensive

Description:

Strategies for helping students meet course expectations when demands are frequent for writing activities.

Purposes:

1. Support students in developing their writing skills required in classes with assigned papers.
2. Provide ungraded feedback regarding the writing skills.
3. Upon request of the course instructor, provide assistance with writing assignments during class time.

Procedures and Examples:

1. Facilitators are not permitted to assign grades to papers or essays.
2. Peer review of papers is an essential activity within the review sessions. Having students work in pairs or triads to exchange papers and provide verbal feedback in these small groups can be less intimidating than conducting as a large group activity. Students are sometimes more likely to receive constructive comments from peers and trust their honesty than from authority figures. Developing this habit of student peer review can be transferred to other classes where formal support systems such as the facilitators are not available or easily accessible.
3. The facilitator can make verbal recommendations to students regarding their papers with the understanding that the final authority for such commentary is with the course instructor. Facilitators are not to take home papers outside of class or review sessions for making written remarks.
4. Review sessions can focus on upcoming writing assignments periodically throughout the academic term. These review sessions may facilitate discussion on:
 - a. brainstorming of a potential writing topic,
 - b. development of a precise thesis,
 - c. time line for completing each phase of the paper (*e.g., topic identification, thesis, first draft, second draft, etc.*),
 - d. editing of drafts,
 - e. reference documentation (*e.g., what is appropriate "evidence" for the paper, what style of documentation is required such as APA or MLA, how should references be cited in the work and in the bibliography at the end of the paper*), sources of information for the paper (*e.g., Internet, journals, books*),
 - f. issues regarding plagiarism, and

- g. peer editing of papers by members of the group.
5. Facilitators need to approach their role as a “co-worker” rather than as an “expert” as they work with students. Asking lots of questions on why choices were made in the paper are more valuable for the facilitator role than marking up papers and returning them to students.
 6. An optional activity of the facilitator is to schedule one or two hours each week in the tutoring lab to meet with students individually for appointments of 15 to 20 minutes each. This activity would be coordinated by the course instructor and the coordinator of the tutoring or writing laboratory.
 7. Invite students to read aloud portions of their draft writing assignments. Getting students into the habit of reading aloud will help them to detect errors that might be missed if they only read the material.
 8. Using visual organizers (*described elsewhere in this manual*) may be very effective for writers who have a poorly organized paper. Often, they need to see a basic overview of their paper, the main and supporting points, and evidence used to support. The student can select the visual organizer that they find most useful.
 9. Have students complete “*microthemes*” where they have to write on a 5 x 8 card. This process requires students to be efficient and organized in answering a question in a restricted amount of space. Examples of these assignment might be: summarize an argument or topic, explain how to solve a problem, write a short essay based on a list of statements related to the topic.
 10. Rather than attempting to identify all individual problems, help students to identify error patterns that reoccur in their papers. This more global strategy will help them to detect and resolve more individual problems in the future.
 11. If the course requires essay question completion for major examinations, time may be spent during review session on practicing for this form of assessment. This might entail timed writing activities of potential essay questions (five to ten minutes each) to simulate the pressure experienced and need to budget time, vocabulary development activities to expand the technical vocabulary of the student that can be used with answering questions, and other means. (*See elsewhere in this manual for strategies concerning examination preparation and vocabulary development*).

References and Suggestions for Further Investigation:

- McCormick, J. (1983). *Writing lab adaptations of SI*. Retrieved from <http://www.umkc.edu/centers/cad/si/sidocs/jmwrit93.htm>
- McMillin, J. (1983). *Adapting SI to English composition classes*. Retrieved from <http://www.umkc.edu/centers/cad/si/sidocs/jmeng193.htm>
- Ochae, R. (1995). *Writing partners: Improving writing and learning through SI in freshman writing classrooms*. Retrieved from <http://www.umkc.edu/centers/cad/si/sidocs/rowrit95.htm>
- Zenger, S. (1999). *Discipline-specific SI strategies for writing*. Retrieved from <http://www.umkc.edu/centers/cad/si/sidocs/szxpap99.htm>

Social Science

Description:

Identifying useful strategies for studying in social science related courses.

Purposes:

1. Dealing with large amounts of assigned reading material.
2. Effectively preparing for examinations employ multiple types of assessment questions that cover numerous chapters of assigned readings and large amounts of lecture note material.
3. Moving beyond memorization of material to deeper learning mastery.

Procedures and Examples:

In addition to the learning strategies previously listed in this manual (*e.g., note review, visual organizers, reading textbooks, etc.*), the following are strategies that are especially important for social science courses.

1. Identify the categories of information for the academic discipline and create an acrostic to remember. For example in history the following six main categories are generally present in each textbook chapter: political, economic, religious, social, intellectual, and artistic. Taking the first letter from each word creates "PERSIA." Creating templates like this help students to organize the new information that they read in assigned readings or hear in the class. Refer to the categories frequently in review sessions to remind students and encourage its use as an organizer.
2. Observe common organization patterns that are required for deeper understanding of the material and are often reflected on examinations. For example in history, sequence of events/ideas and cause/effect relationships are common. For this reason, use of visual organizers such as matrix boxes and time lines are often helpful.
3. Discussions that help students to sort information from assigned readings and lecture notes is especially necessary. Students often report problems identifying and understanding "what's important."

References and Suggestions for Further Investigation:

- Heerspink, J. B. (1994). *The use of spatial representation in history courses and in courses with historical content*. Retrieved from <http://www.umkc.edu/centers/cad/si/sidocs/jhhist94.htm>

Principle Five
Understanding the Problem Solving Process

<p>5. There is high emphasis on understanding the process of solving a problem.</p>	<ul style="list-style-type: none">A. In problem-solving courses, the PAL Facilitator pre-selects a representative set of problems to work during the session.B. Worksheets emphasize different components of the problem-solving process.C. PAL Facilitator works through and solves all problems on the worksheet so that they can facilitate others <u>in the process</u> and avoid potential errors.D. During the session, students generate the steps to solving a problem and discuss their approach on the marker board <i>before</i> beginning with the problem set.E. Students work individually and in groups to solve problems in the textbook, notes, or worksheets.F. Students direct the scribe at the marker board on solving the stated problem.
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1. Read the problem individually
2. Answer the following questions in your group:
 - a) What concept(s) is the problem based upon?

 - b) What information are you given, and what new information are you asked to produce?

 - c) What mathematical, geometrical, or conceptual relationship exists between the information you know and the information you want to learn?

 - d) Restate the information in your own words.
3. Solve the problem individually.
4. Check your answer with your group members. If there is disagreement, find out where you made different choices. Come to an agreement on the correct answer and method of problem solving.
5. When you've come to an agreement, answer the following questions as a group:
 - a) Revisit your answers to question 1, would you make any changes in these answers? If you would, specify the changes.

 - b) Think of a use for the information contained in this problem

 - c) Look at the list of "Comprehensive Problems" at the end of the chapter. Which of these problems are related to this problem?

Principle Six
Self-Monitoring Comprehension

There are several ways for students to verify what they know and do not know about the academic content. This knowledge can help them select appropriate cognitive learning strategies based upon demands of the particular task required. These activities provide ungraded and informal feedback to students about their comprehension level of the material. This provides an opportunity for the student to modify their academic behavior before suffering consequences on major unit examinations.

6. Students develop skill in self-monitoring their comprehension of course material and adapt to the learning task.	A. Informal classroom assessment techniques are used to measure student understanding, help guide PAL session activities, and assess student learning. B. Students acquire strategies to self-test their own comprehension level with course material.
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List of activities:

1. Post Exam Review
2. Informal Quiz
3. Review Session Assessment Techniques

Post Exam Review

Description:

Students review what occurred during the major unit examination.

Purposes:

1. Students analyze what parts of the exam were easier or harder for them.
2. Error patterns in the examination may be identified by the students.
3. The relationship between effort and results may be seen by the students.
4. Students may be encouraged to increase effort and select more effective methods to study for future examinations.

Procedures and Examples:

The following are questions to discuss following a major unit examination in the course. This activity could either be solely an oral discussion or the following questions could be placed on a worksheet for students to complete before opening up for a general discussion.

1. What part of the exam was the easiest? Why?
2. Which part of the exam was the most difficult? Why?
3. Which of the following activities did you do before the exam?
 - a. Read all assigned textbook chapters covered by the exam once (T/F)
 - b. Reread the textbook chapters again before the exam (T/F)
 - c. Took notes about the assigned textbook readings (T/F)
 - d. Reviewed the lecture notes (T/F)
 - e. Self-tested yourself on the material to be covered by the exam. For example, made outlines of answers for the potential essay questions (T/F)
 - f. Prediction of possible questions by you prior to exam (T/F)
 - g. Studied with classmates (T/F)
 - h. Attended one of the study review sessions (T/F)
 - i. Other activities (list)
4. Which of the above activities did you find the most helpful?
5. How much time (in hours) did you spend preparing for the exam? This would include time spent reading the textbook, rereading lecture notes, attending study groups, and studying by yourself.
6. Approximately how many class sessions did you miss before the exam?
7. Did you feel prepared when you walked into the exam? Why or why not?

8. What changes might you make in the way you study for the next exam?

References and Suggestions for Further investigation:

Following is a sample of a survey that is administered by the course instructor in a world history course to help students to think about their behaviors on the exam. The survey is given to the students during the class period when they receive back their exam.

Post-Exam Survey

Do **NOT** write your name on this survey

1. The information that I **remembered best** on the exam I learned by: _____

2. Which of the following activities did you do **before** the exam? (Circle your response)

A. Studying with others

1. Attended a study session conducted by Brian (T / F) How many? ____

2. Studied with other students in the class (T / F)

3. Met with the professor outside of class (T / F)

B. Review of the textbook

1. Read all assigned textbook chapters at least once (T / F)

2. Reread the textbook chapters *again* before the exam (T / F)

3. Took written notes about the assigned textbook chapters (T / F)

4. Read the textbook chapter *before* it was discussed in class (T / F)

C. Review of class lecture notes

1. Printed off the PowerPoint slides sent to me by the professor (T / F)

2. During class I wrote additional comments about the lecture (T / F)

3. Reread the lecture notes again before the exam (T / F)

D. Examination preparation activities

1. Created written outlines for each of the potential essay questions (T / F)

2. Defined each of the vocabulary words listed on study guide (T / F)

3. Predicted potential exam questions based on my notes and readings (T / F)

4. How many hours did you spend preparing for the exam? ____ hours

This includes reading the textbook, rereading lecture notes, attending study groups, and studying by yourself.

5. Practiced writing answers to several of the potential essay questions (T / F)

E. How many class sessions did you miss (for any reason) before the exam? ____

3. Which of the following activities did you do **during** the exam? (Circle your response)

A. Took time to make an outline of my essay question before writing (T / F)

B. Marked up the exam questions by underlining or circling key words and phrases to help make them easier to understand (T / F)

C. When answering essay questions, I looked back at the vocabulary and multiple-choice questions to find more information to incorporate into answer (T / F)

D. About how much time did you take to complete the exam? ____ minutes

4. Name a couple of changes you will make preparing for the next exam: _____

5. Indicate your grade received on the exam (*checkmark one*): ____ A or B; ____ C or Below

The course instructor collects the surveys, summarizes the results of the students who either earned an A or B and those that earned a C or below. The instructor then reports the averages back to the students at the next class period.

Informal Quiz

Description:

This activity is a short, informal quiz over the previous lecture content or assigned reading material.

Purposes:

1. Provides a comprehension checkpoint for the students for them before a major unit examination occurs. Many students have difficulty with this.
2. The Informal Quiz provides a model that displays benefits of self-monitoring before major examinations.
3. A nonthreatening activity since: the quiz is only seen by the student taking it; everyone is writing, even if they do not know the answer since they are instructed to write down the question instead.
4. Students who are weaker have a safer environment to participate since they will be confident of knowing one or more answers to the questions.
5. Builds confidence in many students due to moderate level of the questions and the opportunity to answer questions with multiple correct responses.
6. The informal quiz can be used as a preview for the review session and the major topics.

Procedures and Examples:

1. The activity is often used at the beginning of the session and takes between five and fifteen minutes.
2. Facilitator asks students to write down responses on a scrap of paper to several short questions. Students retain the paper for the ensuing discussion.
3. The questions should be based on the last lecture that have multiple answer options (*e.g., give one of the three reasons for the initial success of Martin Luther*). Facilitator has developed these questions before the review session.
4. Most questions should be of moderate to easy difficulty levels to ensure that students have an opportunity to answer some correctly.
5. Remind students that if they do not know the answer that they should write down the question. This is done so as not to embarrass students who do not know enough to guess the answer.
6. After the questions have been given, the facilitator then asks the group if anyone has an answer for any of the questions. This is done to give the student who is confident of one of their responses. The facilitator should watch for the weaker student and call upon them if they raise their hand.
7. If a student gives an incorrect response, the facilitator should gently ask if the rest of the group agreed. If they do not, ask them why. If no one in the group challenges the incorrect response, the facilitator should respond that they did not have that information

in their lecture notes or the textbook. Turn the group back to the notes and textbook to discuss the difference of opinion.

References and Suggestions for Further Investigation:

Review Session Assessment Techniques

Description:

The following strategies can be used to assess learning within the review session.

Purposes:

1. Allow students to self-discover their level of comprehension of course material.
2. Provide opportunity for the student to make changes in their academic behaviors due to feedback received from the assessment techniques.
3. Provides feedback to the facilitator. If used at the beginning of a session, the planned agenda might be modified. If used at the end of the session, it provides helpful feedback on what students learned at that time.

Procedures and Examples:

More in depth information is provided about each of the strategies in the Angelo and Cross book referenced below. The page numbers for the specific activity is provided. It is intended that these assessments are relatively quick activities, lasting from one to five minutes. They can be used at any time in the review session to motivate student interest, test for comprehension, and serve as a way to summarize new information learned during a review session.

- **Misconception/Preconception Check** (pp. 132-137) This is a technique is focused on uncovering prior knowledge or beliefs that may hinder or block further learning. It is important that students connect to the correct schema.
- **Minute Paper** (pp. 148-153). This is the most popular of all the CATs. Students are asked to take one or two minutes to respond to the following two questions: “What was the most important thing you learned during this review session?” and “What important question remains unanswered?” Facilitators can use these to help guide the upcoming review session and also to see what students most valued from the session. Comments from the students can be used at the following review session as an opening activity or discussion item.
- **Muddiest Point** (pp. 154-158). Students take one minute to respond to what was the “muddiest” or most unclear point in the review session, the assigned reading, or the last class lecture. This gives feedback on what points need additional time or another approach to be taken in dealing with them.

Using assessment techniques during review sessions as a modeled study strategy. These are activities that can be done in a large group and then used by the participants when they are alone or studying with other students.

- **Focused Listing** (pp. 126-131). Students focus on a single important term, name, or concept and are directed to list several ideas that are closely related to that “focus point.” This helps the students to see the connections of the ideas. The group would then share their lists with each other.

- **Empty Outlines** (pp. 138-141). The facilitator provides a skeleton outline of the lecture. Participants use their lecture notes and textbook to complete the outline. This helps them recall and organize the main points of a lesson within an appropriate knowledge structure, making retention more likely and aiding understanding. It also provides a model of a schema for organization that could be used with other lecture material.
- **Memory Matrix** (pp. 142-147). The matrix is a two-dimensional diagram, a rectangle divided into rows and columns used to organize information and illustrate relationships. The facilitator may provide the row and column headings, or it may be a group activity to create the matrix box and name the headings as a group. In addition to the matrix, a variety of other visual organization diagrams could be used. Research suggests that most students fail to use visual organizers with review of their course material.
- **Categorizing Grid** (pp. 160-163). Somewhat opposite of the Memory Matrix, in this activity the matrix and the headings are provided by the facilitator. A list of the contents of the matrix is also provided. The group participant is then to fill the matrix with the individual items. This allows an evaluation of the students' "sorting rules." Students discuss as a group the rules that they used in sorting the information.
- **Pro and Con Grid** (pp. 168-171). This activity provides important information of students analyses and on their capacity for objectivity. Students must search for at least two sides.
- **One Sentence Summary** (pp. 183-187). Students are asked to synthesize an entire lecture into a single informative, grammatical, and long summary sentence.
- **Word Journal** (pp. 188-192). First, the student summarizes a short text in a single word. Second, the student writes a paragraph or two explaining why he or she chose that word. This helps students to write highly condensed abstracts and to "chunk" large amounts of information for more effective storage in long-term memory.
- **Concept Maps** (pp. 197-202). Students draw or diagram the mental connections between a major lecture concept and other concepts that the students already know. This helps students to see connections. It also provides feedback to the facilitator how students are connecting with the information.
- **Problem Recognition Tasks** (pp. 214-217). The students' task is to recognize and identify the particular type of problem each example represents. This strategy is very helpful in problem-solving review sessions (e.g., *math, chemistry*). Identifying the problem type and the first step to take in solving are significant hurdles for many students.
- **What's the Principle?** (pp. 218-221). This assesses students' ability to associate specific problems with the general principles used to solve them. The focus is on the general principle and not the precise individual steps taken to solve the problem.
- **Documented Problem Solutions** (pp. 222-225). Students are asked to identify the specific steps taken to solve the problem. By analyzing these detailed protocols in the review session, students can see the different steps taken by other students. The group can build a protocol for others to use in solving future problems of the same category.
- **Application Cards** (pp. 236-239). After students have dealt with an important principle, generalization, theory, or procedure, the facilitator hands out an index card and asks them to write down at least one possible, real-world application for what they have just learned.

This helps them to connect newly learned concepts with prior knowledge. This helps to increase relevance of what they are learning.

- ***Student-Generated Test Questions*** (pp. 240-243). Students are asked to generate possible examination questions. This provides feedback through seeing what students consider the most important content, what they understand as fair and useful text questions, and how well they can answer the questions that they have posed. It also empowers students to believe that they can predict and study for examinations in a proactive manner rather than believing that exams are chance events and that study is often unpredictable.

References and Suggestions for Further Investigation:

- Angelo, T. A., & Cross, K. P. (1993). *Classroom assessment techniques*. San Francisco, CA: Jossey-Bass.

Principle Seven
Multicultural Sensitivity

7. Multicultural sensitivity is expressed by the PAL Facilitator and the students.	A. PAL Facilitator self-monitors their choices of content material, reading selections, and words spoken B. Session room is arranged so that students can see one another and converse easily.
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The professional literature has a variety to suggestions to improve the effectiveness of communication in groups, especially those with multiple cultures. Culture can be defined as the framework brings to any communication. Culture is more than just race and nationality. It includes contexts regarding disabilities, self-identity which help to form a unique culture for each person.

Suggestions for improving inter-cultural communications within a group. While the following are helpful with any group of individuals, they are especially important for ideal inter-cultural communications.

1. Recognize your own culture and its multiple influences.
2. Detect the biases, ignorance, and prejudices that you are dealing with and how they could impact communication with others. Some of these are unknown to you, but may be expressed and detected by others.
3. Seek to learn about people from other cultures both formally and informally. Learn about common cultural communication and interaction styles.
4. Be consistent between the words spoken and the nonverbal messages communicated to others.
5. Create a welcoming environment within the PAL session.
 - A. Arrange furniture so that everyone can see one another.
 - B. Greet students as they enter the session room.
 - C. Develop relationships with each student who attends the session.
 - D. Seek to involve all students during the session.
6. Intellectual engagement does not always require an active voice. Based on personal culture, some students will be less vocal than others.
 - A. Carefully use peer cooperative learning activities to provide smaller learning spaces that some students may find more comfortable and safer to interact.
 - B. Some peer learning activities such as “Think-Pair-Share” are especially helpful as they give time for individuals to rehearse privately before publicly speaking.
 - C. Create some session activities that require individual action and require written responses.

Principle Eight **Students Actively Engaged**

These are different strategies to engage students in active learning strategies with intentionally structured small learning groups. It is often helpful to vary the different types of peer cooperative learning activities and also to have students work in different small groups.

<p>8. Students are actively engaged with the course material and with each other.</p>	<p>A. Students express behaviors that indicate involvement: taking notes, reading material, solving problems.</p> <p>B. Students work with one another through cooperative learning activities created by the PAL Facilitator</p> <p>C. PAL Facilitator preplans a variety of learning activities to use in their sessions.</p> <p>D. (If applicable) Roles and responsibilities for each member of peer group are clearly stated by the PAL Facilitator.</p> <p>E. PAL Facilitator circulates around the room to monitor the small group sessions, provide help when needed and monitor when to bring the large group back together.</p> <p>F. PAL Facilitator debriefs the peer group learning activity and checks for correct information by leading a discussion of what the purpose/focus of the activity was, and what information was learned as a result of the activity.</p>
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The following activities are common ones that are used to encourage active learning by students. The role of the facilitator is to assign the task, establish the amount of time for the task, assign the members to the small groups, monitor the work of the small groups by rotating around the room during their work, reconvening the large group again, and encouraging students to volunteer and share with the large group

List of Activities:

1. Large Group Discussion
2. Cluster group Discussion
3. Turn-to-a-Partner Discussion
4. Pairs-Compare Discussion
5. Think/Pair/Share Discussion
6. Jigsaw Discussion
7. Academic Controversy Discussion
8. Group Survey Discussion

Large Group Discussion

Description:

Activity that involves the entire group in a simultaneous discussion. While this appears to be the easiest and simplest of the discussion activities described in this section of the training workbook, it is actually the most difficult. This is because as the group increases in size, people are less likely to talk and be engaged with the material.

Purposes:

1. Quickly check for comprehension of material just presented or skill with a process.
2. Works best after students later in the academic term have become more comfortable with one another and with talking before a group.
3. Used sparingly since it is the most difficult discussion activity to encourage student participation and engagement.

Procedures and Examples:

1. Discussion facilitator assigns a discussion task and procedures for the group. The facilitator designates the amount of time for this discussion activity.
2. Each participant may be directed to engage in silent reading or work on a problem assigned by the facilitator. This activity may include writing a statement or working on a worksheet. The facilitator announces the amount of time for this task (*generally one or two minutes, perhaps longer if solving a problem*). Or, the facilitator may directly begin the discussion with no time for review or rehearsal.
3. The facilitator invites volunteers to explain the answer to the question or problem with the large group. The facilitator looks for opportunities to redirect discussion back to other group members and refer them to the textbook, lecture notes, and other reference materials.
4. If incorrect information is provided by group members, the facilitator redirects them back to the textbook, their own lecture notes, and lecture notes by other members of the group.
5. This activity ends by the group developing a summary of the discussion.

References and Suggestions for Further Investigation:

Cluster Group Discussion

Description:

Simultaneous discussion of the same question or material by several small groups.

Purposes:

1. Increase likelihood of individual participation in discussion by providing small group discussion environment.
2. Often is a less structured small group discussion strategy than others described in this section of the training workbook.

Procedures and Examples:

1. Discussion facilitator assigns a discussion task and procedures for the group. The facilitator designates the amount of time for this discussion activity.
2. Facilitator breaks large group down into small groups of three or four for the activity. The facilitator may also designate roles for members of the groups: facilitator, blackboard scribe, recorder, reporter (*see elsewhere in this manual for discussion of these and other roles for discussion participants*).
3. The facilitator instructs all small groups to then explain the answer to the question or problem to one another.
4. Facilitator circulates around the room as the small groups discuss with one another. The facilitator monitors groups to ensure they are on task, each member is participating, clarifies the task as needed, and monitors their progress. The time schedule for the activity is followed with announcements to the group when to move to the next phase.
5. After the small groups have completed their discussion, the large group is reformed once again. An individual from each small group is invited to share a portion of their group's discussion with the larger group. This phase of the activity seeks to provide a group summary of the discussion and correct any erroneous information shared within the small groups.

References and Suggestions for Further Investigation:

Turn to a Partner Discussion

Description:

This smallest of discussion groups provides an immediate activity to process information or a procedure. No time is provided for preparation for the activity,

Purposes:

1. Provides a quick opportunity to interact with another person to check comprehension of material or procedure to which they were just exposed.
2. Ensures that everyone participates in the discussion.
3. Increases confidence of a person to participate in a discussion since only one other person is involved.
4. By requiring each person to explain a concept or a process, each individual is more likely to remember the information.
5. Works well as an activity in rooms where furniture is in fixed position (*i.e., lecture hall*) and students cannot easily move around to face one another.
6. Can serve as a simple and relatively quick discussion activity.

Procedures and Examples:

1. Discussion facilitator assigns a discussion task and procedures for the group. The facilitator designates the amount of time for this discussion activity.
2. Facilitator breaks large group down into pairs for the activity. A group of three is formed if there is an uneven number of people participating.
3. The facilitator instructs all pairs to then explain the answer to the question or problem to one another. Immediately one member of the pair begins to explain their answer to the other. Half way through the designated time, the facilitator reminds all pairs that they should reverse their roles.
4. Facilitator circulates around the room as the pairs discuss with one another. The facilitator monitors groups to ensure they are on task, each member is participating, clarifies the task as needed, and monitors their progress. The time schedule for the activity is followed with announcements to the group when to move to the next phase.
5. After the pairs have completed their small group discussion, the large group is reformed once again. Individuals are invited to share a portion of their discussion with the group. This phase of the activity seeks to provide a group summary of the discussion and correct any erroneous information shared within the small groups.

References and Suggestions for Further Investigation:

Pairs Compare Discussion

Description:

Pairs of students compare their answers to a problem or question.

Purposes:

1. Most useful when there are multiple answers to a problem or ways to solve a problem.
2. Foster higher-level thinking skills.
3. Increase likelihood of identifying all potential answers to the question or approaches to solving a problem.
4. By requiring each person to explain a concept or a process, each individual is more likely to remember the information.

Procedures and Examples:

1. Discussion facilitator assigns a discussion task and procedures for the group. The facilitator designates the amount of time for this discussion activity.
2. Facilitator breaks large group down into groups of four for the activity. A group of five is formed if there is an uneven number of people participating.
3. Within each small group, two pairs of teams are formed.
4. The facilitator instructs all pairs to then explain the answer to the question or problem to one another with one person recording the information generated.
5. Half way through the designated time, the facilitator asks all pairs that they should explain what they learned with the other pair. One team shares one item, then the other team shares one item. This cycle continues until all information is shared from the two pairs with each other.
6. Following this cycle of sharing, the two pairs then form a group of four. This new group then identifies new information and approaches to the problem or issue.
7. Facilitator circulates around the room as the pairs discuss with one another. The facilitator monitors groups to ensure they are on task, each member is participating, clarifies the task as needed, and monitors their progress. The time schedule for the activity is followed with announcements to the group when to move to the next phase.
8. After the small group of four has completed their discussion and generated new information, the large group is reformed once again. At least one individual from each small group shares a portion of their discussion with the large group. This phase of the activity seeks to provide a group summary of the discussion and correct any erroneous information shared within the small groups.

References and Suggestions for Further Investigation:

Think/Pair/Share Discussion

Description:

This small group discussion procedure mixes activities that require silent work by each person and paired discussions.

Purposes:

1. Increase confidence of individuals with the task since they are given time to think and rehearse before sharing their comments with another person.
2. Increase competency of individuals with the task since they have time to prepare.

Procedures and Examples:

1. Discussion facilitator assigns a discussion task and procedures for the group. The facilitator designates the amount of time for this discussion activity.
2. Facilitator breaks large group down into pairs for the activity. A group of three is formed if there is an uneven number of people participating.
3. Each participant engages in silent reading or work on a problem assigned by the facilitator. This activity may include writing a statement or working on a worksheet. The facilitator announces the amount of time for this task (*generally one or two minutes, perhaps longer if solving a problem*).
4. After the silent activity phase is concluded, the facilitator instructs all pairs to then explain the answer to the question or problem to one another. Immediately one member of the pair begins to explain their answer to the other. Half way through the designated time, the facilitator reminds all pairs that they should reverse their roles.
5. Facilitator circulates around the room as the pairs discuss with one another. The facilitator monitors groups to ensure they are on task, each member is participating, clarifies the task as needed, and monitors their progress. The time schedule for the activity is followed with announcements to the group when to move to the next phase.
6. After the pairs have completed their small group discussion, the large group is reformed once again. Individuals are invited to share a portion of their discussion with the group. This phase of the activity seeks to provide a group summary of the discussion and correct any erroneous information shared within the small groups.

References and Suggestions for Further Investigation:

Jigsaw Discussion

Description:

A complicated topic or task is broken down into parts with each addresses by a small group who seek to solve their part of the jigsaw puzzle.

Purposes:

1. Useful when dealing with a large amount and perhaps complex section of academic material that could not be effectively addressed in the amount of time during the discussion session.
2. Helps individuals to see the need for breaking down complex material into its natural component parts.
3. Models a useful strategy that students could employ in classes where formal discussion group leaders and sessions are not provided.
4. Encourages students to be interdependent upon one another when completing tasks that would be difficult for an individual to complete by themselves.

Procedures and Examples:

1. Discussion facilitator assigns a discussion task and procedures for the group. The task is broken into parts for completion by separate small groups. The facilitator designates the amount of time for this discussion activity.
2. Facilitator breaks large group down into small groups for the activity. These groups are composed of three to four individuals.
3. The facilitator instructs each small group to then answer to the question or problem to the part of the activity that has been assigned to them. If there are more small groups that tasks, more than one small group may be assigned the same task. Groups are kept small to increase opportunity for each member to participate and be actively engaged in the process.
4. Facilitator circulates around the room as the pairs discuss with one another. The facilitator monitors groups to ensure they are on task, each member is participating, clarifies the task as needed, and monitors their progress. The time schedule for the activity is followed with announcements to the group when to move to the next phase.
5. After the small groups have completed their discussion, the large group is reformed once again. One individual from each small group shares a portion of their discussion with the larger group. This phase of the activity seeks to provide a group summary of the discussion, allow each small group to teach the others about the part of the topic not explored by them, and correct any erroneous information shared within the small groups.

References and Suggestions for Further Investigation:

Academic Controversy Discussion

Description:

Participants explore several potentially conflicting perspectives on the same issue.

Purposes:

1. Use with academic material of a controversial nature that has multiple perspectives.
2. Recognize that there may be multiple perspectives that appear contradictory on the same issue, but may be reconciled after discussion.
3. Better understand an issue by both defending and opposing positions associated with it.
4. Practice skills for rationally advocating for a position on an issue with others who do not share the same perspective.

Procedures and Examples:

1. Discussion facilitator assigns a discussion task and procedures for the group. The facilitator designates the amount of time for this discussion activity.
2. Facilitator breaks large group down into groups of four for the activity. A group of five is formed if there is an uneven number of people participating.
3. Each small group of four is broken into two pairs. One pair represents one side of the academic controversy (pro). The other pair represents the other side (con).
4. Outside of hearing by the other pair in their small group, each pair prepares for the debate on the issue by engaging in reading a portion of the textbook, reviewing lecture notes, or reviewing other reference materials with their partner. The facilitator announces the amount of time for this task (*generally several minutes*). To ensure that they are ready for the next phase of the activity, each pair may write a statement, organize their arguments, and complete a worksheet prepared by the facilitator.
5. After the preparation phase is concluded, the facilitator instructs all pairs to then advocate their position on the issue to the other pair. The pro side goes first, then the con side.
6. When most all the small groups have completed presentations by the con side, the facilitator instructs all pairs that they should reverse their roles. The con side now advocates the pro position. The pro position in turn must then advocate the con position. They can use material and strategies employed in the previous round, or they may add a different approach to advocating for their position.
7. Facilitator circulates around the room as the pairs discuss with one another. The facilitator monitors groups to ensure they are on task, each member is participating, clarifies the task as needed, and monitors their progress. The time schedule for the activity is followed with announcements to the group when to move to the next phase.
8. After the small groups have completed both rounds of the debate, the large group is reformed once again. At least one member of each small group shares a portion of their debate with the large group. A recorder notes all the evidence and logic used to

support either position on the black board. This phase of the activity seeks to provide a group summary of the discussion and illustrates the complex nature of the topic. The facilitator probes the students concerning their use of evidence and their logical thinking in advocating the positions.

References and Suggestions for Further Investigation:

Group Survey Discussion

Description:

Provides an opportunity for each participant to share their perspective on a question, topic, or approach to solving a problem.

Purposes:

1. Ensure that each participant has an opportunity to talk.
2. Helpful for groups where some members are reluctant to talk due to dominance by a few individuals or needing more encouragement to participate.

Procedures and Examples:

1. Discussion facilitator assigns a discussion task and procedures for the group. The facilitator designates the amount of time for this discussion activity.
2. The facilitator may instruct each participant to engage in silent reading or work on a problem assigned by the facilitator. This activity may include writing a statement or working on a worksheet. The facilitator announces the amount of time for this task (*generally one or two minutes, perhaps longer if solving a problem*). Of the facilitator may skip this step and move immediately to asking each participant to respond to the survey.
3. After the silent activity phase is concluded, the facilitator instructs all participants to then explain the answer to the question or problem to the entire group. Either the facilitator can ask for volunteers or simply begin with one member of the group and go around the circle until all have answered.
4. The facilitator carefully listens to the responses by each individual. If the answer is unclear or incomplete, the facilitator asks the person to extend their answer. A recorder may be designated to record the tally of responses and perhaps to write them on the black board.
5. If responses concerning a controversial issue from some participants seem to be unpopular with the larger group, the facilitator must provide support to the individuals with their right to their perspective.
6. If factually incorrect information is provided, the facilitator may need to ask the individual to compare their response with the textbook, lecture notes, or other reference material. This provides an opportunity for the individual to self correct their response rather than the facilitator acting as the authority figure.
7. After everyone has responded to the survey, the facilitator decides what to do with the information. This phase of the activity seeks to provide a group summary of the discussion and correct any erroneous information shared within the small groups.

References and Suggestions for Further Investigation:

Principle Nine

Theory Guides Learning

9. Good educational theory always guides effective learning practices.

A. Carefully consider how individual PAL session activities and decisions made by the PAL Facilitator are guided by learning theories.

One of the challenges for students is selecting the appropriate study strategy to fit the requirements of the learning situation. Each class and instructor present different challenges for the student. This requires the student to thinking strategically about the class and be able to self-monitor themselves whether their study plan is working and whether changes need to be made. A term used to describe this proactive approach is the “self-regulated learner” (Weinstein and Stone, 1993).

Affective Domain Issues Impacting Student Learning

One of the difficulties with advocating to students to take such a proactive approach is the student’s view of themselves. The question becomes whether they can really make a difference or not. Many students believe that they are relatively helpless regarding academic performance. A term associated with this issue is “*locus of control*” or “*attribution of efforts with results.*” Which makes the difference, the student’s inner power or the external forces acting upon them? A more extreme attitude to this is viewing the academic world as a lottery. These students see that seems to be little relationship between the effort they expend in school and the grades that they receive. Students buy their weekly lottery ticket (*e.g., show up for class, read the textbook once, take some modicum of lecture notes, study a few hours before the exam*) and hope for the best. Sometimes the strategy works and they win, receiving a passing grade. Sometimes they lose. But they do not believe that spending a lot of effort really makes a difference.

Another affective domain issue impacting student achievement is the type of motivation that drives them for higher grades. The more technical term for this is “*goal orientation.*” Do they strive for higher achievement because they want to (internal) or are they trying to please others such as parents or other significant people in their lives (external). The research is clear that most college students are not able to sustain high grade achievement is they are externally oriented. Success in college requires a personal commitment to the goal and not attempting to satisfy the aspirations of others.

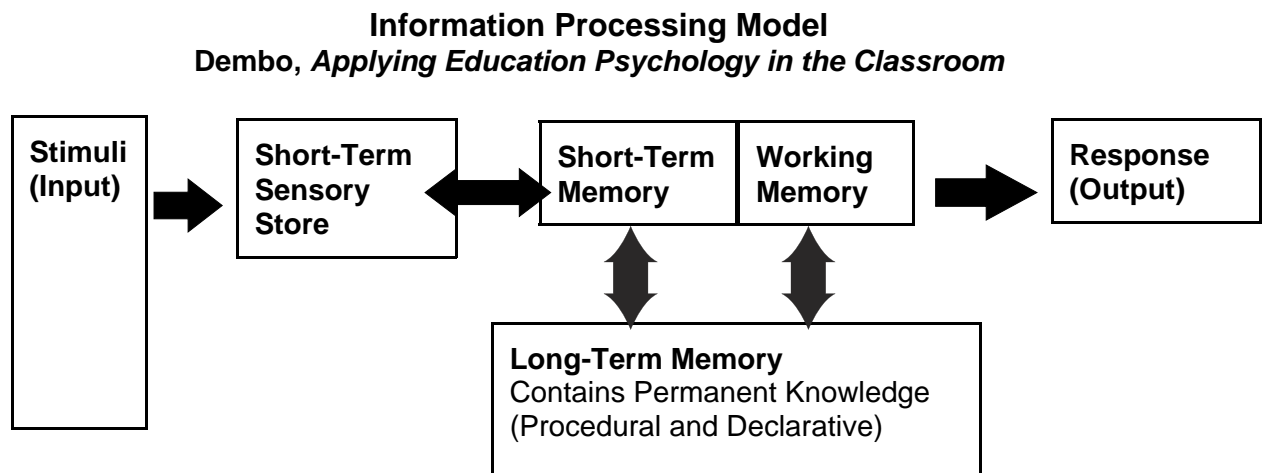
The Self-Regulated Learner

According to research from Weinstein and Stone (1993, pp. 1-2), major variables that separate expert and novice learners: experts know more; knowledge held by experts is better organized and more integrated; experts have more effective and more efficient strategies for accessing and using their knowledge; experts seems to have different motivations for acquiring and using their knowledge; experts evidence more self-regulation in both the acquisition and application of their expertise. They continue by stating that four kinds of knowledge are needed by expert learners: knowledge about themselves as learners (*e.g., their cognitive characteristics*); knowledge about the cognitive demands of the academic tasks; knowledge of a wide variety of strategies and study skills; and prior knowledge of the

content material (pp. 3-5). They conclude by sharing essential steps to establish executive control in studying: create a study plan and revise it on the basis of personal feedback and grades received throughout the academic term; select the specific strategies or methods they will use to achieve their goals; implement the methods they have selected to carry out their plan; monitor and evaluate their progress on both a formative and summative basis; if students are not reaching their goals, they must modify what they are doing; make an overall evaluation of what was done and decide if this is the best way to go about meeting similar goals in the future (pp. 10-11).

Information Processing Model of Learning

A classic model for explaining the way that many students effectively learn material is called the “*Information Processing Model*” (Dembo, 1998). It is based on making the analogy that most people learn as computers would: information is inputted, analyzed, and then can be used for a task. Information must first be received, then entered into short-term memory, moved into long-term memory, and finally recalled for use with a task (*e.g., completing examination questions*). While somewhat mechanical, it provides a basic framework to add newer theories of learning that are more sensitive to affective and cognitive learning preferences that attend to individual differences of gender and culture. These are powerful issues that have an important impact upon student achievement.



The following outline provides suggestions of study strategies that students can employ. Some of these strategies can be done alone, other work best in small groups. The strategies have been broken down into the categories defined by the Information Processing Model. The key for student success is the constant process of monitoring themselves regarding comprehension of the material. The final section provides some suggestions for this process.

I. Improve Short-Term Sensory Store or Sensory Register (*Activities to increase initial awareness of new information.*)

- Watch for verbal and visual cues from instructor regarding importance of different pieces of information presented during the lecture.
- Move to front of class to clearly hear and to see charts, graphs, and board work.
- Arrive early to class and pay attention to instructor's comments during the first minutes at beginning of class and during the final minute when many students are already stopped taking notes and preparing to depart the class.
- Preread textbook chapter and study new vocabulary words to increase receptivity to newly presented lecture information.
- Study the course syllabus to identify major concepts, schedule of upcoming topics, and other course-related information.
- Experiment with new ways to improve original lecture note taking (*e.g., mind maps, Cornell method*).

II. Methods to Improve Short-Term and Long-Term Memory by effective use of Learning Strategies

A. Improving Short-Term Memory of New Material

1). Recitation Strategies (*Reinforce the content material just exposed to by repeating it*)

- In a group with other students take turns reading lecture notes aloud so that others can contribute missing material and for students to discover that the need to improve their note taking approach since they are missing material.
- Throughout the day review new material from the class. Write material on note cards to more easily memorize information
- Use mnemonic devices to increase memorization of new material.
- Use of abbreviations while taking lecture notes to save time and keep up with both the lecture and visual images on the board by the instructor.
- Employ specific strategies when reading textbook material the first time (*e.g., SQ3R, reading with purpose, integration of lecture notes with textbook*)
- Mark and underline key concepts in the textbook.
- Keep list of new words and concepts and look up in textbook glossary.
- Recopy lecture notes quickly after class is over to increase memorization of material.

B. Improving Long-Term Memory of New Material

1). Elaboration (*Taking new material and extending it*)

- Create analogies with new information linking it with material already learned.
- Review lecture and textbook material by paraphrasing, applying, and integrating it with other material.

2). Organization (*Taking new material and reorganizing it into meaningful ways*)

- Create visual matrix to reorganize material into logical categories.
- Draw concept maps or continuum lines to show relationships among concepts.
- Create time lines to display sequences of events.
- Identify steps for solving problems (*e.g., identifying needed formulas for solving problems, identifying the steps to solve*)

III. Comprehension-Monitoring Strategies

- Approach each class as a unique learning experience and carefully employ the specific learning strategies required for the academic task. This will probably require frequent changes and modifications throughout the academic term.
- Create a time management plan to guide studying for each course. Then monitor results from examinations to assess changes to the schedule.
- Create mock exams to practice answering objective and writing questions under time pressure before the official examinations. Many textbooks have study questions at the beginning or end of the chapter. Part of the SQ3R reading strategy and the Cornell note-taking method is self-testing the material.
- Provide informal quizzes where students can test one another regarding course comprehension before major exams occur in the class.

- ❑ Conduct a post-exam survey after each major examination where students can discover relationships between the assigned grade and behavior of the student (*e.g., amount of time studied, amount of text book reading, types of questions difficult to answer on exam*).
- ❑ Take advantage of counseling and testing services on campus to discover more about the student (*e.g., academic content testing, student motivation, learning preferences*). This can provide valuable information for the student to consider about their strengths and weaknesses.

Conclusion

The Information Processing Model provides a basic framework for a student to develop a more effective plan for achieving their academic goals in college. This article suggests some learning strategies that many have found helpful. There are many more than these. The most important concept that underlies this approach to learning is that students have significant control over their academic achievement.

References and Suggestions for Further Investigation:

- ❑ Dembo, M. H. (1998). *Applying educational psychology* (5th ed.). New York: Longman
- ❑ Weinstein, C. L., & Stone, G. (1993). Broadening our conception of general education: The self-regulated learner. In N. Raisman (Ed.), *New directions for community colleges: Directing general education outcomes*. San Francisco: Jossey-Bass