Teach to Learn

A Curriculum Guide for Instructors in the Face-to-Face Classroom

NATIONAL AMERICAN UNIVERSITY
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Module 1:  
Teach to Learn – An Overview

*Teach to Learn* was designed to provide ideas and guidance – from ice breakers to assessments – for your face-2-face classroom. Consider this to be a “tool box” of ideas for you to use when designing your curriculum.

As you familiarize yourself with this document, you’ll see that each module offers ideas on classroom activities. For example, *Module 10: Classroom Assessment Techniques* [CATs] was designed to provide you with ways of getting feedback regarding student learning. Feel free to revise the CAT to best suit the learning objective and course content you are teaching. For example, asking students to complete a content map requires that students organize subject matter as a way of assessing their understanding of the material. You may find that this activity would best fit your lesson if you had students complete the in-class activity in small groups and then have students design and agree upon a “master concept map” on the board. This gives students an opportunity to challenge one another regarding their understanding of material.

Finding teaching and assessment techniques that work for you, the subject matter you are teaching, and your students is a trial-and-error process. Every class has its own “personality” – sometimes a class has students who are talkative and respond well in spontaneous class discussions. Other classes might respond better to a learning experience if you require small group interactions or written responses. An activity that worked well last quarter may bomb this quarter – and vice versa. *Teach to Learn* is here to provide options that will “fit” your class.

*Teach to Learn* was constructed with both novel and seasoned instructors in mind. As you read through the content, some of the ideas might seem obvious or basic, especially for those who have been in the classroom for a while. While we don’t want these fundamental ideas and instructions to seem patronizing, our goal was to design *Teach to Learn* to be elemental enough for new teachers who have been assigned to a class at the last minute.
Module 2: Preparing for Class – Some Considerations

The first week of class is when you set the tone and climate for the rest of the quarter. This is the time when your students get to know who you are and you define your expectations for the course. It’s a good idea to allow students a chance to decide on their own goals for the class during the first week. The manner in which you do all of this will influence the classroom atmosphere. It’s important for you to remember that the climate of your classroom is created by action – so take some time before the first day of class and decide on what you want to do and say.

It is crucial to create a class schedule that outlines your expectations. The more defined this document is, the more successful your students will be. The class schedule should describe the criteria and expectations of a successful student. Like a road map, the more detail you give students telling them where you want them to go and how you want them to get there, the better chance you have of getting students to hit that mark.

Creating a Class Schedule

Your class schedule should be welcoming, clear, and thorough. Consider the following checklist to guide you when developing your class schedule.

- Instructor’s name and contact information
- Instructor’s teaching philosophy
- Course information – include a welcome message from the instructor
- Motivational information or tips on succeeding in the class – include expected study time
- Textbook and other instructional material needed or recommended for the course (including lab supplies)
- Classroom policies – include attendance, participation in learning experiences, expectations for conduct, food and drink, cell phones, seating options, grading policy
- Assignments and Assessments – include reading assignments, grading criteria (rubrics) and weight of graded/required activities, due dates, types of exams, papers, or projects, make-up/late policies, academic integrity
- Student Support Services
- Instructional approach – writing intensive, service learning, case studies, team-based learning, peer reviews/class sharing

See Module 3 for a sample class schedule that you can use as a template.
Course Syllabus

The syllabus for your course is posted on National American University’s intranet site MyNAU. Course syllabi are developed by subject matter experts and approved by program assessment committees as well as the university’s curriculum council. System-wide syllabi are developed to ensure that NAU students learn the same course content, no matter which campus they take the class. Please remember you need to attach the master syllabus to your class schedule.

Syllabi are written using the performance-based learning approach to learning.

For more information on National American University’s curriculum philosophy, turn to Module 4: Performance-Based Learning.

Promoting Attendance & Class Participation

Multiple studies have shown that students who go to class not only get higher grades, but they are more likely to remain enrolled in school. As an instructor, you can increase attendance by doing the following:

- Learn the students’ names.
- Get students to learn the names of their classmates.
- Require a respectful atmosphere in the classroom.
- Show a positive attitude toward the students and enthusiasm for the subject matter.
- Implement interactive learning experiences in the classroom.
- Take roll and appoint class participation points.

Turn to Module 5 for a sample class participation rubric that you can use as a template.

Creating a Goal Sheet

Students need to understand the importance of commitment. A goal sheet can serve as the student’s contract with him/herself as well as with you. Goal sheets record what the student is working to achieve in this class. This record of his/her commitment and expectations can make
a significant difference and can give you, the instructor, a powerful tool in helping students get back on track.

Encourage students to fill out the Goal Sheet honestly. At mid-term, revisit the goal sheet. Let students compare how they are doing with what they committed to at the beginning of the quarter.

**Module 6 contains a sample Goal Sheet that you can modify for your students.**

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**Learning Styles**

Students often organize and study for their courses in the same way they did in high school, and often this approach is inadequate for them to be academically successful. Additionally, low-performing students frequently do not have a grasp on what study/learning techniques are ineffective or which new techniques might help them grow. College professors expect these students to find new effective and efficient ways to study on their own; however, introducing learning styles is an excellent way to encourage students to take responsibility for their own learning.

When a student becomes aware of his/her learning style, he/she can increase self-awareness and knowledge of the effectiveness of different types of learning techniques. Additionally, teaching students about learning styles empowers students to become responsible for their own learning. Consider telling students to take a learning style inventory. The *Index of Learning Styles Questionnaire*, developed by Richard Felder and Barbara Soloman, is an excellent tool and is free. [http://www.engr.ncsu.edu/learningstyles/ilsweb.html](http://www.engr.ncsu.edu/learningstyles/ilsweb.html)

After students complete the questionnaire, they instantly receive their results. Take the questionnaire and see what you think. If you are impressed with it, you will be able to honestly tell your students it is worth their time and effort to take the questionnaire and learn from their results. As an instructor, you are encouraged to design your curriculum to include a variety of activities that will teach to all types of learning styles.

**Modules 7.1 & 7.2 contain additional information about learning styles.**
Introductions

The first day of class is critical—it sets the tone and gives you the opportunity to get the quarter off on the right foot. Introductions are exciting—students are curious to learn about you and their classmates as well as talk about themselves. Use this time to get to know who is in your class. Who are your students? What do they want—from you, the class, each other, and themselves?

Module 9 has ideas for you to use for introductions.

Assessment

Does anyone have any questions? You ask the question and follow it with a pause. You search the faces looking back at you. No one asks anything. You move on.

Rarely will a student ask a question or admit he/she doesn’t understand the lecture. Some students don’t want to feel slow or stupid in front of their classmates so they don’t speak up. Other students won’t know how to phrase a question—they don’t know how to articulate that which they don’t understand. These students, too, remain quiet.

And still yet other students don’t ask questions because they think they understand the lecture material. These students leave the class period believing they “got it.” This can easily happen when the instructor is able to present the material fluently; the listeners believe that they are following along and know what the lecturer is speaking about. But, later, these students discover that they are not able to re-explain or apply the information.

Turn to Module 8 for more information about students with low metacognition skills.

As an instructor, this disconnect is evident when you are grading an exam and are disheartened at how low the scores are. There are strategies to help you bridge this disconnect—this bridge is constructed with formative assessments. Summative assessments are midterms, finals, papers, and other traditional ways of measuring student learning. Formative assessments are used between summative assessments and give the instructor feedback regarding student learning. Using formative assessments gives an instructor feedback on student learning; it lets instructors know if students understand the material.

Formative assessments include sample problems, worksheets, drafts, and other works in progress. Formative assessments provide instructors with an opportunity to give feedback to students and they give students an opportunity to rework problems, rewrite drafts, or
reanalyze their answers. When this happens, a student’s understanding of what is being taught increases. In addition, formative assessments provide an opportunity for significant student learning to take place prior to a summative assessment.

Formative assessments can also include class discussions. When instructors ask a question and the class engages in answering the question, the instructor is able to ascertain the class’ understanding of the subject matter. Classroom Assessment Techniques [referred to as CATs], also provide instructors with ways to give formative assessments.

**Module 10 has a variety of Classroom Assessment Techniques [formative assessments] and other ideas for curriculum design.**
Module 3: Class Schedule Template

**COURSE CODE / COURSE NAME**

**Quarter / Year**

Instructor’s Name: ___________________________  Work phone: ____________________

Email address: _______________________________  Cell: __________________________

*Do not hesitate to contact me. There is voice mail on both lines.*

Teaching Philosophy / Welcome:

Instructional Approach:

Administrative policies:
<table>
<thead>
<tr>
<th>Class/Date</th>
<th>Competency</th>
<th>Chapter</th>
<th>Assignments / Due Dates</th>
</tr>
</thead>
</table>
| 1 – 05/01(T) | | | Introduction, course syllabus/schedule/grades  
| | | | Critical thinking |
| 2 – 05/05 (Th) | | | |
| 3 – | | | |
| 4 – | | | |
| 5 – | | | |
| 6 – | | | |
| 7 – | | | |
| 8 – | | | DUE: |
| 9 – | | | |
| 10 – | | | |
| 11 – | | | |
| 12 – | | | DUE: |
| 13 – | | | |
| 14 – | | | |
| 15 – | | | |
| 16 – | | | |
| 17 – | | | DUE: project |
| 18 – | | | |
| 19 – | | | |
| 20 – | | | |
Grading Summary

20% Attendance/Class Participation

- Attendance and in-class participation make up 20% of your grade. So, show up and speak up. The more you invest in class discussions, the more information you will learn and retain.
- Class participation is graded primarily on the quality of your comments. I expect students to engage in classroom discussions thoughtfully – meaning you consider your comments before sharing them with the class. Are your comments about the topic being discussed – or are they about a different topic? Will your comments contribute to the discussion or will they “derail” conversation?

30% In-Class Preparation and Assignments

- Late work is not accepted. You will be allowed to skip submitting one assignment or submit one assignment late without having it affect your grade.
- You are held responsible for preparing for every class meeting. It is critical that you come to class having read the textbook and completed the assignments. When you have prepared for class in this way, the class time can be spent furthering your understanding of the material.

20% Article Review / MBTI Self-Analysis

- You will complete either an article review or the MBTI self-analysis project. Information/directions will be covered in class. Due date is posted in the table above.

10% Midterm Exam

20% Final Exam

TIPS ON HOW TO BE SUCCESSFUL IN MY CLASS:

CLASSROOM POLICIES:

STUDENT SUPPORT SERVICES:
National American University uses a *performance-based learning* approach to designing curriculum. Performance based learning is a model of teaching which requires that the learner knows in advance the knowledge, skills and attitudes he/she will be required to demonstrate upon completion of a learning experience. Performance based learning aligns how the student will learn and how he/she will be assessed with intended educational outcomes.

The performance-based learning design is based on a four stage learning cycle:
1. **Motivation** facilitates the attention process and inspires learners to learn.
2. **Comprehension** activities enable learners to process and construct the content and concepts in their working memories.
3. **Practice** applying the learned information, doing what they have been hearing about. Begins with guided practice and gradually shifts to learners performing independently. Learners extend practice by applying learning to varied contexts.
4. **Application** allows the learners to show they can use their knowledge in real-world and new-context situations. They prove to themselves, and to their teacher, that time in the first three stages was spent well. In this stage, learners complete meaningful and authentic assessment activities, using their newly developed competence, and sharing it with you and/or their classmates.

This approach holds teachers and learners both accountable for the achievement of each **competency** on the syllabus. A competency is a major skill, knowledge, or attitude that is learned during a given learning experience. Competencies are measurable and observable and can be broken down into two or more objectives.

**Active learning** techniques are employed in performance-based learning. Active learning is based on **experiences**, during which the student is doing or observing an activity which is directed by the competency, and **reflection**, during which the student thinks about what he/she is learning and how that learning is taking place.

The two key points from this description are that the curriculum is **performance-based** and that it makes extensive use of **active learning techniques**.

The performance-based approach is augmented by the following internal guidelines:

1. That individuals learn and grow, not through the internalization of disconnected experiences, but rather that individuals **construct** progressively more sophisticated knowledge through an on-going process of selectively connecting new information to what is already known [motivation];

2. That the process of constructing new knowledge is facilitated by focusing on fewer concepts in greater depth ("less is more") [comprehend];

3. That the most effective teacher is the one who **facilitates** the construction of new knowledge on the part of the learners, not the one who transmits the most factual information [comprehend];
4. That people have different learning styles and that the most effective instruction is that which uses multiple teaching/learning strategies to reach the largest number of learners [comprehend];

5. That students retain their enjoyment of, interest in and appreciation for learning when concepts are taught in the context of relevant personal, societal or environmental issues [comprehend];

6. That knowledge gained from "hands-on" experiences is retained longer than information that we only hear or read about [practice]; but

7. That "hands-on" is not sufficient; students learn more, retain longer, and maintain their inherent enjoyment of, interest in and appreciation for learning when "hands-on" activities are designed to allow students to discover answers to questions for themselves rather than only to verify what the teacher has already said [practice];

8. That students learn from each other as well as from teachers, parents, and traditional educational materials; cooperative learning through group work enhances learning as well as the acquisition of acceptable social skills [practice]; and,

9. That student learning is enhanced and greater authenticity in evaluation is achieved when evaluation procedures are authentic and accurately reflect all of our educational objectives, including students' attitudes toward learning, their ability to solve problems, and their ability to design new investigations, not just their ability to memorize factual information [apply].
Module 5: Class Participation Scoring Guide Template

Use the following criteria to guide the type of participation expected in the classroom:

5 POINTS [LETTER GRADE EQUIVALENT: A]
- Student has prepared for class.
- Student contributes to class discussion without dominating; contributions are relevant and thoughtful.
- Student is interested in and respectful of other people.

4 POINTS [LETTER GRADE EQUIVALENT: B]
- Students has prepared for class.
- Student contributes to class discussion when called upon; contributions are relevant but less developed.
- Student is interested in and respectful of other people.

3 POINTS [LETTER GRADE EQUIVALENT: C]
- Student is unprepared for class. Student attempts to bluff their way through class discussions or makes minimal contributions when called upon.
- Student participates in class discussion but in an unproductive way. Student may dominate the class or make rambling and irrelevant contributions.
- Student does not listen to or show respect for classmates.
- Despite this, these students show interest in class lectures and group activities.

2 - 1 POINTS [LETTER GRADE EQUIVALENT: D – F]
- Student is unprepared for class; student does not attempt to participate.
- Student appears to be on the outskirts of the class and is withdrawn.
- Student may be disruptive, displaying hostile or bored body language.
- Student may exhibit rude behavior toward the instructor or classmates.
Module 6: Goals/Action Plan Template

Course Code / Course Name

Student Name ____________________________________________________________

Major: __________________________________________________________________

Goal setting is a critical first step toward achievement. As you enter this class and read through the syllabus, think about what you want to accomplish by taking this course.

Before writing your goals and action plan, take time consider what you want from this course. Do you want to simply “get through it”? Do you want to enjoy the course? What are your expectations?

Write down your goals.

- Top three goals for this course:
  - _______________ ________________________________________________
  - _______________ ________________________________________________
  - _______________ ________________________________________________

- Grade I want to earn: ______________

What other courses have you taken in this subject? ____________________________________________

Setting goals will help you become motivated. Once you commit to what you want to achieve in this course, you will be more likely to take action to realize your goals.

What actions are you willing to take to fulfill your goals?

- Attendance ______________________ (20 classes total)

- Participation ____________________________

- Being prepared ____________________________

- Study time outside of class ____________________________

- Handing in my work ____________________________

- Getting help ____________________________
MID-QUARTER CHECK

The course is half over. It’s time to analyze your progress. Re-read your goals and the action plan you outlined on the front of this paper. Do you want to continue with these goals/action plans?

If you want to revise your goals/action plans, revise them below.

**Revised Goals:**

**Revised Action Plan:**

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INDEX OF LEARNING STYLES QUESTIONNAIRE

Developed by Richard Felder and Barbara Soloman – North Carolina State University
https://www.engr.ncsu.edu/learningstyles/ilswb.html

ACTIVE LEARNER STYLES AND STRATEGIES

- Discuss information – formal and informal discussions
- Apply information (especially to scenarios)
- Explain information to others
- Group activities
- Study in a group

REFLECTIVE LEARNER STYLES AND STRATEGIES

- Time to think
- Work alone
- Review course material
- Create questions/applications using course material
- Write summaries of readings and notes

SENSING LEARNER STYLES AND STRATEGIES

- Solve problems by proven methods
- Want course material in tests to be explicitly covered in class
- Patient with details
- Good at memorizing facts and hands-on work
- Careful and practical
- Want connections to be real world – connect with specific examples

INTUITIVE* LEARNER STYLES AND STRATEGIES

- Discover possibilities and relationships
- Innovative (dislikes repetition)
- Comfortable with abstractions and mathematical formulations
- Work faster
- Don’t like memorization and routine calculations
- Find theories which link the facts
- Prone to careless mistakes on tests (impatient with details)
VISUAL LEARNER STYLES AND STRATEGIES

- Remember what they see
- Look for diagrams, photos, charts, etc.
- Will use CD-ROMs with information
- Concept maps
- Color coding information

VERBAL* LEARNER STYLES AND STRATEGIES

- Written and spoken explanations
- Write summaries
- Work in groups
- Listen to others
- Create explanations

SEQUENTIAL* LEARNER STYLES AND STRATEGIES

- Follow linear steps
- Fill in “skipped steps”
- Outline lecture material in logical order
- Strengthen global skills by relating new topics to concepts students already know

GLOBAL LEARNER STYLES AND STRATEGIES

- Learn in large jumps
- Solve complex problems quickly
- Put things together in novel ways
- Need the “big picture” before can master the details
- Skim the chapter before reading it
- Immerse in a subject for longer blocks of time
- Relate material to what is already known
- Need to believe in their ability to “get it”

*Most college courses are aimed at this learning style

Module 7.2: Teaching to All Types of Learning Styles

- Teach theoretical material by first presenting phenomena and problems that relate to the theory.

- Balance conceptual information (*intuitive*) with concrete information (*sensing*).

- Make extensive use of sketches, plots, schematics, vector diagrams, computer graphics, and physical demonstrations (*visual*) in addition to oral and written explanations and derivations (*verbal*) in lectures and readings.

- To illustrate an abstract concept or problem-solving algorithm, use at least one numerical example (*sensing*) to supplement the usual algebraic example (*intuitive*).

- Use physical analogies and demonstrations to illustrate the magnitudes of calculated quantities (*sensing, global*).

- Occasionally give some experimental observations before presenting the general principle, and get the students (preferably working in groups) to see how far they can get toward inferring the latter (*inductive*).

- Provide class time for students to think about the material being presented (*reflective*) and for active student participation (*active*).

- Encourage or mandate cooperation on homework (*every style category*).

- Demonstrate the logical flow of individual course topics (*sequential*), but also point out connections between the current material and other relevant material in the same course, in other courses in the same discipline, in other disciplines, and in everyday experience (*global*).
Module 8: Metacognition

Metacognition is the knowledge or awareness of one’s own cognitive processes and the ability to monitor and control those processes. In other words, do your students understand their own strengths and weaknesses in their learning process? What makes learning “click” for them? Do they “miss the boat” on occasion? Encourage students to pay attention to their self-talk regarding their ability to learn. When students say “I can’t learn math” or “I’ll never understand this,” the odds are they won’t get it—not because of their cognitive abilities but because of their psychological stance.

Those with low metacognition skills are unaware of not comprehending new information. When a concept is difficult for them, they tend to skim over it, not noticing that they didn’t understand what they’ve just heard or read. Does this help you, as an instructor, understand why some students are surprised when they get a test back and find they did poorly on it? Think of how empowered students would be if they developed strong metacognition skills! If each of us had the ability to understand what our individual learning weaknesses were, we would become aware of these trouble spots and could develop ways of compensating for them.

Helping students build on and strengthen their metacognition skills is a residual outcome of the constructivist approach. Processing concepts and new information by using this approach helps students become more aware of what they are NOT learning, which can be as important as understanding what they are learning. This knowledge would assist any person in their journey of life-long learning.

Revising one’s approach in the classroom should be a step by step process; it is not recommended that you shift your approach in one fell swoop. There are multiple websites and books out there with wonderful and helpful information.
**Ice Breaker Activity**

To find out what your students want from your course, it can be useful to do the following activity at the start:

Give each participant a sheet of paper with 4 questions to be answered in 5 minutes:
- What made you come here to do this course?
- What do you want from this class?
- What are your concerns about attending this class?
- Where would you rather be? (This can lighten the proceedings and gives the participants "permission" to relax.)

The result of this activity can be put on a flipchart and referred to as and when needed throughout the rest of your course. It also means you are responding to the participants' needs and can tailor your activities to suit.

**Paper Planes Ice-Breaker**

You get everyone to write a couple of questions on a sheet of paper relating to the previous presentation. Then each person makes their paper into a paper plane (or screws it up into a paper ball). You divide the class into 2 teams on opposite sides of the room and encourage everyone to chuck their planes about. After a short while, everyone must pick up a plane closest to them and read aloud and answer the questions. If you have lots of people, then folk should pair up and decide which is the best question to answer from their selection.

**Scavenger Hunt Ice-Breaker**

**Required:** Just a pencil and paper

**Players:** Small to large groups

Make a list of things for teams to look for through their wallets, purses, and possibly what’s on their bodies. Divide into teams by tables, pairs, individuals, or what seems best. Here is a list of ideas of what they can look for but modify the list to your liking. [Do not list where they might find these items.]
- 1975 penny
- $2 bill
- $100 bill
- Hologram (usually found on a credit card, don’t tell them this!!!)
- A bird (usually found on a credit card)
- Pick a few states from the new quarters (Delaware, Michigan, Florida)
- Pearl (earring or ring)
- Black sock
- Roman numeral (found on a watch)
- Susan B Anthony dollar
- Picture of a tree
- Tic Tac,
- Paper clip
- Measuring tape
- Ruler
- Peppermint candy
- Toothpick
- The word Moses (if they have a bible)
- M&M
- Tums
- Children’s Tylenol
- Thermometer
- White button
- Pink nail polish
- Screw driver
- Nose ring
- Tweezers
- Mirror
- Ankle bracelet
- Red hair
- Raisin
- Triangle
- Charge slip over $200, and so on.

Make a list and copy off the list for each team. Have them check off which items they have. The team with the most checked off wins the challenge! At the end, tell them where they could have found some of the items.
NAME GAME

(For smaller classes) Students stand or sit in a circle. The first student says “hi” and his/her name and his/her favorite toy/candy as a child. Then the next person does the same and repeats what the first person said. The process continues and as you go around the room, as each student first introduces him/herself and then repeats the name and favorite toy/candy for each person who has gone before. Students have a good time with this.

FIND SOMEONE WHO...

Before class, create a handout with a list of statements (8 – 10) that have something to do with class and/or outside activities. Students take the list and move around the room, asking classmates with which statements they agree. Students sign their name under the statement that is true for them.

Example

Directions: Your task is to find a person in this class who agrees with one of the statements below. Have the classmate sign his/her name next to the statement he/she agrees with. You have 5 minutes to see how many signatures you can collect.

Find someone who

1. Likes to golf
2. Is from your home state
3. Whose major is the same as yours
4. Has read a book for pleasure in the past month
5. Owns a dog
6. Drives a blue car
7. Played a sport in high school
8. Has more than 3 brothers/sisters
9. Subscribes to at least 2 magazines a month
10. Is left handed
30 Second Introductions

On the board, list several topics [examples posted below] large enough so that it is easily seen. Explain to the class that they will have a chance to visit with several students about the topics on the board – but they will only have 30 seconds to exchange information. At the end of the thirty seconds, you will blow a whistle or signal to the class that they must find a different student with whom to talk. Blow the whistle when you are ready to begin.

Here is an example of the type of topics you can post on the board:

1. Name PLUS two of the following:
   - Where he/she graduated from high school
   - Pets, kids, both, neither
   - Home state
   - First, middle, last, or only child

2. Answer one of the following in one sentence:
   - Possible career you are considering
   - Favorite class or teacher in elementary, middle, or high school
   - What you are doing when you are not at school
   - What you wish you were doing when you are not at school
   - Something few people know about you

Every 30 seconds, blow the whistle so everyone moves to find a new person to talk. Continue with the activity for 3 – 5 minutes. At the end of the activity, students return to their seats having met students they have not met before. It’s fast, enjoyable, and provides a foundation for future interaction.
Background Knowledge Probe

List as many items within a specific category.

Example
List Shakespeare plays that you are familiar with.

Focused Listening

Quickly list and define 5 to 7 basic concepts.

Example
Quickly list and define all of the terms associated with Newton's Second Law, F=ma.

Empty Outlines

During the final ten minutes of class, students complete an empty outline of the lecture they just heard.

The Memory Matrix

“The Memory Matrix assesses students’ recall of important course content and their skill at quickly organizing that information into categories provided by the instructor. By using this technique, teachers can quickly see not only whether their students have memorized the basic information but also how well they have organized that information in their memories" (Angelo & Cross, 1993, p. 142).
The Memory Matrix is simply a two-dimensional diagram, a rectangle divided into rows and columns used to organize information and illustrate relationships. In a Memory Matrix, the row and column headings are given, but the cells, the boxes within, are left empty. When students fill in the blank cells of the Memory Matrix, they provide feedback that can be quickly scanned and easily analyzed.

Procedure for memory matrix

- Always try it yourself first. Revise as needed.
- Make the cells large, encouraging students to write more than one word or phrase in each cell. Ask for at least 3.
- Group or paired work works well with this.
- The more cells, the greater the difficulty.

To assess: see what students know well and what they need to work on. Look for patterns. Tally correct or incorrect responses.

THE MINUTE PAPER

This quick technique helps the instructor find out what students have gotten out of a given day's class and works well with both large and small classes.

Background and Purpose

No matter how beautifully prepared our classroom presentation may be, what the student hears is not always what we think we have said. The one-minute paper is a quick and easy assessment tool that helps alert us when this disjuncture occurs, while it also gives the timid student an opportunity to ask questions and seek clarification.
**Method**

In its basic format, the instructor takes the last minute (or, realistically, three minutes) of class and asks students to write down short answers to two questions:

- What was the most important point made in class today?
- What unanswered question do you still have?

Responses can be put on 3x5 cards that you hand out or on the student's own paper. Students can be allowed to respond anonymously, which encourages them to admit points of confusion, or they can be asked to write their names so that the instructor can write a brief, personal response to each question. Instructors can also encourage thoughtful answers by giving extra credit.

The questions can be modified in various ways, but they should remain open-ended. In one variation, the instructor can ask each student to name five significant points that had been made in that session. This can be especially useful in identifying the range of perceptions of what has been happening in class. By spending some time early in the quarter discussing these perceptions and how they relate to what the instructor hopes that the students will see as the central ideas of the class, students can learn how to identify the central themes in each lecture.

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**Misconception / Preconception Check**

Start by identifying some of the most troublesome misconceptions/preconceptions students bring to the course. Select a handful of these ideas and beliefs and create a simple questionnaire about students' beliefs and ideas in these areas. NOTE: This is especially useful with social/behavioral science courses that deal with controversial or sensitive issues.

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**The Muddiest Point**

The “Muddiest Point” is a teaching assessment technique developed in 1989 by Dr. Frederick Mosteller, a Harvard University professor of statistics. It is a simple classroom assessment tool that requires little preparation time for the instructor and only a few minutes of time for the students. The muddiest point is used to assess what students are having trouble understanding during a class. It provides the instructor with feedback on items that are confusing and it can be used at different intervals.

The instructor can use the muddiest point technique when covering complex or confusing information, before starting on a new subject, or at the end of a class. The technique basically consists of the instructor asking the students to write down or post on a class discussion board what they have had trouble understanding during the class – “What is the muddiest point in this session?” If asking the question during the class, the instructor can gather the papers and
discuss some of the items mentioned. Verbal answers can also be used instead of paper to facilitate discussions on the muddiest points. If the muddiest point technique is used at the end of a class, papers can be taken up, reviewed, sorted by subject, and discussed at the beginning of the next class. If an electronic form is used, students can be encouraged to respond outside of class to classmates, clarifying points they understood.

By using the muddiest point technique, the instructor helps the students to:

- Develop the ability to evaluate and integrate ideas and information;
- Improve classroom skills, such as attention and listening skills;
- Learn details, terms or concepts, and theories from the lesson; and
- Promote active participation with class content.

This whole process increases the trust between instructor and student; the instructor demonstrates concern for the student’s learning when implementing the technique and simultaneously receives information about the students’ on-going attention to the course.
**Categorizing Grid**

**Purpose:** To help the instructor determine what the student knows and doesn’t know.

**Overview:** In many disciplines, especially at an introductory level, a first step to real problem solving is learning how a variety of conceptual taxonomies work. In other words, students need to learn the rules for what goes with what. Categorizing grids can be a useful diagnostic aid in these situations. Courses in the biological and life sciences, for example, lend themselves easily to the use of this technique. To begin, you will need to identify a key taxonomy and then design a grid that represents those interrelationships. Keep it simple at first. Avoid trivial or ambiguous relationships, which tend to backfire by focusing students on superficial kinds of learning. Although probably most useful in introductory courses, this technique can also be used to help develop basic study skills for students who plan to continue in the field. The grids can be used as homework or to generate group-based online or in-class discussions. This is effective in small and large classes and useful for online adaptations.

**Example of Categorizing Grid**

<table>
<thead>
<tr>
<th>Divisions of Aorta</th>
<th>Primary Branches</th>
<th>Subdivisions</th>
<th>Region or Organ Supplies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ascending aorta</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arch of the aorta</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thoracic aorta</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abdominal aorta</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Tips:**

- Be sure categories don’t overlap.
- Look for mis-categorized items, missing items, and patterns of error.
- Use a simple grading system (0 – 1 – 2, or check +/- check -).
DEFINING FEATURES MATRIX

Works well for helping student distinguish between closely related or seemingly similar concepts or items (e.g., biology, geography, chemistry).

Example Defining Features Matrix

<table>
<thead>
<tr>
<th>Wave Concept</th>
<th>Sound Waves</th>
<th>EM Waves</th>
<th>Matter Waves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allows polarization</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Pulse or shock</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Periodic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rqrs medium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carries energy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transverse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Longitudinal</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TIPS:

- Select 2 or 3 most important concepts.
- Explain why you’re doing this.
- Sketch out your own matrix first.
- Give a time limit.

PRO AND CON GRID

- Select a decision, judgment, or dilemma.
- Write a prompt that will elicit thoughtful pros and cons.
- Identify the number of items you want in each list and whether phrases or sentences are necessary.

Example:

“For some time now, certain critics within and outside of the Roman Catholic Church have argued that priests should be allowed to marry and have children. In responding to this assessment exercise, consider the pros and cons of abolishing the requirement of celibacy from the perspective of the church as an organization. List about five important potential advantages and an equal number of disadvantages.” (Angelo & Cross, 1993. p. 170).

1. Which points are most frequently made?
2. Are any missing? Extraneous?
3. How balanced are the sides of the grid?
**Analytic Memos**

**Criminal Justice Example:** Imagine you are an officer with a department, which has just suffered a major budget cut. Write a memo to your "chief" regarding how you think the department should deal with the budget cut. Identify major stakeholders and political resources. After writing this memo, write a paragraph or two discussing how memos stand up to scrutiny from supervisors or the public.
Synthesis and Creative Thinking Assessments

One Sentence Summary
Who Does What to Whom When, Where, How, and Why?

Pathology example: How does HIV infect and affect the immune system?
Auto mechanics example: How is an engine's fuel-air mixture ignited?
____________________________________________________________________________

Word Journal
Student chooses a single word, which best summarizes an assigned reading assignment and then writes a paragraph explaining why that word is a good summary of the text.
___________________________________________________________________________

Approximate Analogies:
Students create their own analogies for concept relationships. After creating the analogies, students sort their own by quality (good/questionable/poor) or perhaps sort by other valuation such as humor. After collecting and reviewing, pick several to share with the class.

For example:
The theme is to an essay as _______ is to _______.
Mass is to weight as _______ is to _______.
Ozone depletion is to the EPA as _______ is to _______.
____________________________________________________________________________
RSQC2:
RECALL, SUMMARIZE, QUESTION, CONNECTION, CONFIDENCE

✓ Recall and list the most important ideas from the previous class.
✓ Summarize each idea in the list.
✓ Write one Question about material from the previous class that you want answered.
✓ Make one Connection between the material from the previous class and any from before that.
✓ Rate your Confidence, during the last class, with the material.

PROBLEM RECOGNITION TASKS

✓ Provide students with a few examples of common problem types.
✓ Students must recognize and identify the particular type of problem each example represents.

Example
Give five statistical word problems and ask students to indicate which statistical procedure would best solve each problem (without solving the problem).

To expand on this idea, you can ask students to:

1. Work in pairs or groups
2. Develop parallel examples
3. Justify responses using facts/evidence
4. Identify the clues an expert would use in developing a solution
**Directed Paraphrasing**

**Examples**

1. In one or two sentences, paraphrase what you have learned about hospice care to inform a dying, but still lucid, patient of its possible advantages over hospital or home care.

2. Imagine you are the city’s deputy police commissioner in charge of community relations and public affairs. For a two-minute presentation at a meeting of the police officers’ union, paraphrase the arguments in favor of creating a civilian review board. Then, for an equally short argument at the next public meeting of the city council, paraphrase the arguments against creating a civilian review board.

**Tips**

- Do it yourself before assigning to students.
- Tell them who the audience is and the purpose for doing it.
- Provide a word/time limit.
- Explain how you will grade or respond to this exercise.

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**Documented Problem Solutions**

Draw or create two columns. In the first column, the student solves a problem (or the problem is already solved). In the second column, specify the reason or principle for each step in the solution.
**Additional Assessments and Ideas**

**Application Cards**

1. After students have heard or read about an important principle, generalization, theory, or procedure, hand out an index card.

2. Ask students to write at least one possible, real-word application for what they just learned on a card. Use separate cards if asking for more than one application.

Examples:

*(Econ)* Gresham’s law basically states “good money drives out bad.” Give at least one contemporary application of Gresham’s law to something other than money.

*(Physics)* In his *Principia*, Newton set forth his Third Law, the heart of which is “To every action there is always opposed an equal reaction.” Give three applications of Newton’s Third Law to everyday life around the house.

*(Psych)* Psychologists have long noted the effects of “primary effect” and “regency effect” on recall of information. These effects have some implications for classroom teaching and learning. Suggest one or two applications of the implications for teachers using the lecture method.

3. Label cards G, A, M, N (Great, Acceptable, Marginal, Not acceptable).

4. Sort cards into piles. Share 3 good examples and one or two poor examples with students.

**Classroom Opinion Polls**

Identify questions or issues about which students may have opinions that could affect their learning. Draw up a question or prompt and the response choices.

You can encourage students to experiment with www.polleverywhere.com. This site allows polls to be taken via texting and results can be displayed in the classroom via computer. Using this software is free of charge and responses are anonymous.
**Double-entry Journals**

Students create two columns on a sheet of paper. On the left side they copy a few lines or a short passage of text that was particularly meaningful. On the right side students should write their reactions to these excerpts – their agreements, disagreements, questions, etc. Ensure that students know beforehand that the instructor will read their remarks.

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**Direct Paraphrasing**

Students paraphrase an important theory, concept, or argument that they have studied in some depth – be sure students know who the audience is, what the purpose is, and the number of sentences to paraphrase.

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**Student-generated Test Questions**

To make this strategy work, you have to be willing to include (revised) student questions in your tests, or at least to let students know what kinds of questions will be included.

Do this assignment 2-3 weeks before a major exam to allow time for feedback and adjustments in teaching/studying.

1. Decide what types of questions on what specific topics you want on the exam. Write this information down for students.

2. Decide how many questions they should generate. One or two questions of any type are usually enough, especially if you want students to supply answers.

3. Explain to students how their questions will be used. Tell them when to expect feedback, and why this will help them do better on the test.

4. Once collected, look for patterns – which topics are over-/under-represented? Well-written/poorly-written.) At what level of difficulty are questions written? (Use Bloom’s Taxonomy.) A checklist could make this task easy.

5. Select examples to provide feedback to students. Decide which questions to share as study aids. A handout could make good test review material.

6. Students might work in pairs or groups to develop/find answers to questions.
**In-Class Responding**

Using pink and green colored 3x5 cards, students vote on whether a statement is “true” or “false” by holding up green for “true” and pink for “false” on the count of three. Teachers can estimate the results (e.g., 70% voted “true”) and encourage interactive discussion. Students can debate why their answer is correct; students can discuss their answers in small groups, etc.

Variation: 4 colored cards to represent “A,” “B,” “C,” and “D” answers. The teacher can put a multiple choice question on the board/overhead projector.

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**Meta-Cognitive Moment**

After presenting information on a topic, the instructor writes down simple, analytical, and synthesizing questions on the board. Students are placed in small groups (3 – 4 students/group) and instructed to discuss what they think the answers to the questions are. If all the students in the group agree on the answer, they write down “Yes” on their answer sheet; they write “No” if they do not agree on an answer. This technique provides review of the material and decreases test anxiety.

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**Think – Pair – Share**

The instructor poses a question or problem, and students are given a specific amount of time to write down their individual answer/response. Then students are paired with a classmate to discuss their answers. After students have had a chance to talk with each other, the teacher can call on a few students to share their answers with the class. Teachers can also ask students to turn in a written answer for points.

Feel free to use the Think-Pair-Share template below.
THINK – PAIR – SHARE

Name: ______________________________________________________________

Directions
Consider the following question or problem:

Think
Write two - three answers or ideas you have about this question or problem.

1. 
2. 
3. 

Pair
Discuss your ideas with a partner. Check any of your ideas above that your partner also wrote down. Write down ideas your partner had that you did not have below.

1. 
2. 
3. 

Share
Circle the idea you think is the most important. You or your partner will share this idea with the whole class.

As you listen to the ideas of class, write down the ideas you think were best.

1. 
2. 
3. 
CONCEPT MAPS
Here students create visual representations of models, ideas, and the relationships between concepts. They draw circles containing concepts and lines, with connecting phrases on the lines, between concepts. These can be done individually or in groups, once or repeated as students acquire new information and perspectives, and can be shared, discussed, and critiqued.

To find an endless supply examples and templates of concept maps, type “Concept Map” into a search engine. Google Images is great.

REPRESENTING INFORMATION
Give students some information in a text format and, with a partner, have students re-represent the information (diagrams, pictures, and/or charts) and share it with the class.

ELABORATE / ORGANIZE
- Have students elaborate on concepts by adding details and information that connect new
- Information with prior knowledge.
- Have students organize new information into meaningful patterns that reflect the underlying structure of the concepts that are being taught.

STUDENT-LED REVIEW SESSIONS
Instead of the traditional instructor-led review session, have the students do the work. For example, in review sessions spend half the time working in small groups. Each student is to ask at least one question related to the material he or she doesn't understand, and to try to answer a question raised by another student. Students can also practice discussing, illustrating and applying difficult material or concepts, or drafting exam questions. For the second half of the review session, the whole class works together. Students may ask questions; other students volunteer to answer them. All students who ask or answer questions receive a "treat" (e.g., small candy bars, gum, etc.). Instructor will only interject if there is a problem. Be sure to explain what will be going on ahead of time so students are less frustrated when the instructor doesn’t stand up and simply review the material, give the answers, or tell them what to study!

For example: Games such as jeopardy and crossword puzzles can be adapted to course material and used for review, for assignments, or for exams. They can be used at the individual, small group, or full class levels. There are now some computer programs, for example, to help you create crossword puzzles.
COLLABORATIVE LEARNING GROUPS (CLG)
These may be formal or informal, graded or not, short-term or long-term. Generally, you assign students to heterogeneous groups of 3-6 students. They choose a leader and a scribe (note-taker). They are given a task to work on together. Often, student preparation for the CLG has been required earlier (reading or homework). The group produces a group answer, paper, or project. These work best in small to medium size classes.

ANALYSIS OR REACTIONS TO VIDEOS
Videos offer an alternative presentation mode for course material. Videos should be relatively short (5-20 minutes). Screen them to make sure they are worth showing. Prepare students ahead of time with reaction or discussion questions or a list of ideas on which to focus; this will help them pay attention. After the video, have them work alone or in pairs to answer critical questions, write a "review" or reaction, or apply a theory.

STUDENT DEBATES
These can be formal or informal, individual or group, graded or not, etc. They allow students the opportunity to take a thesis or position and gather data and logic to support that view, critically. Debates also give students experience with verbal presentations. Some faculty members ask students their personal view on an issue and then make them argue the opposite position.

MINI-RESEARCH PROPOSALS OR PROJECTS
A CLASS RESEARCH SYMPOSIUM
Have the students work on designing a research study on a topic from the class. In some situations, you may be able to have them collect data during class time (observe some situation or give out some short surveys) or you may have them doing this as part of an outside-of-class project. Either way, have students present their research in a class research symposium (similar to how faculty present at professional meetings). Invite other faculty and students.
**Analyze Case Studies**

Bring in case studies for students to read. Have students discuss and analyze the case, applying concepts, data, and theory from the class. They can work as individuals or in groups or do this as a think-pair-share. Consider combining this with a brief in-class writing assignment.

**Write and Produce a Newsletter**

Have small groups of students produce a brief newsletter on a specific topic related to class. Students should include articles with relevant research, post information on upcoming related public events, and so on. Share these with faculty and students in related courses or in the major.

**Role Playing**

Role playing introduces problem situations dramatically. It provides opportunity for people to assume roles of others and thus appreciate another point of view, allows for exploration of solutions, and provides opportunity to practice skills. The instructor must clearly define the problem or situation and roles as well as give very clear instructions.

**Worksheets**

Worksheets allow students to think for themselves without being influenced by others. Individual thoughts can then be shared in large groups.

**NOTE:** Having students complete low-stake worksheets based on the reading assignment has a tremendous impact on motivating students to complete the assignment before coming to class.

**Guest Speaker**

Having a guest speaker personalizes the topic and can break down stereotypes. The instructor has to contact speakers, coordinate appearance, and introduce the speaker.
PROBLEM-BASED LEARNING—CASES
Students use knowledge, concepts, and skills relevant to a course to solve realistic business problems.

PROBLEM-BASED LEARNING—GUIDED DESIGN
A student team attacks a problem by dividing it into a series of prescribed steps (e.g. identify the problem, state the goal, list constraints, etc.). The problem is then resolved following the prescribed order. After each step, the instructor provides written "expert" analysis elaborating on the various alternatives the students had available during the previous step.

GROUP LEARNING—TEAMWORK
Students work together in teams, collaborating to complete a problem or project.

DEVELOPING A NEW PRODUCT OR ARTIFACT
Instructors can create activities for students to use digital or technological tools. Examples include web page editing, using e-mail and other communication tools, using digital drop boxes for file sharing, utilizing server space to post projects online, and employing tools that allow for voting on or attaching comments to students' work for the purpose of recognizing best or improving weak artifacts.

TRAVELING VIRTUALLY
SITUATING CURRICULUM IN THE CONTEXT OF EXPEDITIONS
A significant grant budget may be required to create live expeditions, consisting of technology to upload live broadcasts to satellites and back down to Internet servers with live audio/video streams; alternatively, quests could be videotaped and delivered at a later time via standard Internet video streaming.
**Leading Question**
A leading question so framed as to guide the student questioned to respond with a particular obvious answer. This answer is then explored in further depth which may ultimately conclude with an answer that was not so explicit, or one that fosters cognitive dissonance, moral challenging, or self-questioning on the part of the student.

**Puzzle, Enigma, Contradiction**
Information presented to the student that is accurate, but is incomplete, ambiguous, or paradoxical in nature.

**Connecting a Topic**
Pointing out similarities between the topic to be studied and one that is more contemporary, more familiar, or more interesting to your students.

**Devil’s Advocate**
Instructors may choose to play the devil’s advocate to argue against a cause or position not as a committed opinion but purely in order to provoke a discussion or argument, or to determine the validity of the cause or position.

**Focused Questioning**
Focused questioning is designed to extract the underlying assumptions, circumstances, or logical construction of a cause, position, or opinion.
**Pretest**
A pretest is an examination given before the instruction that tests what students will be expected to know after the instruction. It enables instructors to know what kinds of initial knowledge and misconceptions students have when they begin the module of instruction.

**Brainstorming**
A method of collaborative problem solving in which all members of a group spontaneously contribute ideas, or a similar process undertaken by an individual to solve a problem by rapidly generating and recording a variety of possible solutions.

**Collaborative Listing and Ranking**
A group process, by which members determine the individual aspects or elements of a task or concept, then prioritizes them or places them in a hierarchical order.

**Cognitive Analogies**
Students are encouraged to imagine multiple ways in which an idea, fact, explanation, procedure, etc. could be understood. How, for example, might a painter represent Darwin’s ideas about kin selection? Or, how might the musicological structure of a Beethoven violin sonata be realized with tinker toys? Or, how might Oedipal conflicts serve to represent the confinement of negative electrical charge to specific nuclear orbitals?

**Student-Created Charts, Matrices, Flowcharts, Models**
Students are encouraged to build charts, matrices, flowcharts, and models as contexts for extending their understanding of key course-specific concepts. This sort of exercise encourages students to ask: What would a good model look like? How should the model actually be constructed? What are the strengths and weaknesses of the model? Computers provide an excellent resource for this sort of work (SimCity is a nice example of a commercial product that enables multi-level modeling of techno-socio-political problems, ideas, issues, etc.).
**Simulations, Scenarios**

Simulations are the reproduction of the essential features of an organization or system as an aid to study or training. While the simulation represents the real process or entity, it can never equal it in complexity or completeness. A scenario is a narrative that recites the important elements of a situation or process within an organization or system.

**Problem-Based Learning**

Problem-based learning is a pedagogical strategy based on constructivist learning theory that simultaneously develops both problem solving strategies and disciplinary knowledge bases and skills by placing students in the active role of problem solvers. Students are confronted with problems that are "ill-structured," that is, they do not have clear-cut, absolute answers. These problems reflect the complexity of real-world situations. The tasks are designed to be as authentic, in terms of emulating real-world tasks and environments, and are designed to foster the transfer of learning to real-world situations that the learner may encounter in the future. In addition, they require learners to actively explore information resources other than the teacher, including primary documents, reference materials, and community members, and to draw on knowledge from diverse subject areas.
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Teaching and Learning Philosophy

Our philosophy of teaching and learning supports performance-based instruction and incorporates active learning principles designed to make academic success inclusive. Students participate in constructing their own learning by actively engaging in the learning process.

We believe in designing quality curriculum based on the following:

— this includes the measurable and observable knowledge, skills and attitudes specified in the course syllabi that must be mastered by learners. Learning is facilitated through activities and demonstrated through assessments.

— students are active participants in the construction of new knowledge by integrating new information with prior learning. Active learning is based on significant learning experiences.

— these are valued learning experiences that impact students’ lives and ready students for their professional futures. They require higher-level thinking, high energy and engagement on the part of the student.

— significant learning experiences are best facilitated through learner-centered activities. This includes integrating learning activities, which address different learning styles and multiple intelligences in a caring and supportive environment.

— learning is assessed best by the most relevant and direct means possible and in the most meaningful context possible. Authentic assessment is an integral part of the learning process as it provides feedback, which facilitates development of meta-cognitive skills. Self and peer assessments promote self-evaluation, in turn promoting life-long learning skills.

— fostering a sense of community among learners so that they begin to meld learning and multicultural understanding. Collaborative learning provides the opportunity to explore global connections, thus enhancing the core skills of ethical behavior, team-playing, problem-solving and critical thinking. This prepares learners to be leaders in the 21st century.

— general education courses introduce inquiry and analysis through critical thinking/problem solving activities. Disciplinary courses further the problem-based learning; capstone courses culminate the inquiry approach by requiring students to synthesize knowledge and skills acquired in the major, general education and co-curricular experiences.

— learners build connections across disciplines as they bridge the divide between theory and practice.

— dovetailing with integrative learning, deep learning occurs when students focus on substance and the underlying meaning of information. Deep learners seek out relationships between pieces of information and how to apply knowledge to real life. In doing so, learners strive to integrate and synthesize new information with prior learning.

Motivate ✶ Comprehend ✶ Practice ✶ Apply

Curriculum Group production