AN 210: Archaeological Methods and Analysis

Inst.: Richard Bordner
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Texts, Required: White, Gregory & Thomas King 2007. The Archaeological Survey Manual. Walnut Creek: Left Coast Press.
Loubser, Johannes H.N. 2003. Archaeology: The Comic. Walnut Creek: Altamira Press.
Texts, Recommended: Hester, Thomas et al. 1997. Field Methods in Archaeology (7th ed.). NY: McGraw-Hill. (good reference text).

Course Description: While not as exciting nor romantic as portrayed by Hollywood, archaeology has a mystique that has fascinated people for centuries. Archaeology is the study of the material aspects of culture and human activity-the objects we produce and the ways we modify the landscape. This course will provide a general introduction to techniques and analysis used by archaeologists. It is designed to serve as the foundation class for further coursework in archaeology or as the training course prior to participating in actual archaeology field projects. It also serves as a basic course for individuals in fields where archaeological techniques and procedures are a central part of their work such as forensic science and historical research.

The Marianist Values of Chaminade University, which we strive to incorporate into this class:
1) Educate in formation of faith
2) Provide an integral quality education
3) Educate in family spirit
4) Educate for service, justice and peace
5) Educate for adaptation and change

General Education Learning Outcomes for this course:
The student will demonstrate an understanding of:
1. The application of the scientific method to the study of human behavior in various environmental contexts;
2. Human behavior relative to various environmental contexts;
3. Human behavior relative to adapting to various changing environmental contexts.

Behavioral Science Division Student Learning Outcomes for this course:
1. Ability to apply the scientific method to the study of human behavior in various environmental contexts
2. An understanding of human behavior relative to various environmental contexts
3. An understanding of human behavior relative to adapting to various changing environmental contexts

Course Learning Outcomes:
1) To demonstrate that they understand and can apply basic techniques of archaeological methods;
2) To demonstrate basic communication skills;
3) To demonstrate an understanding of the professional ethics and values in the field of archaeology;
4) To demonstrate an awareness of the diverse interest groups that impact archaeology;
5) To demonstrate an understanding of the issue of stewardship of the archaeological heritage and its implications;

6) To demonstrate an awareness of the social relevance and real-world problem solving possibilities in archaeology.

Course Objectives: 1) Develop a basic understanding of how material culture studies are conducted and how they provide insights into past cultures and human behavior;
2) To encourage a more complex and imaginative way of perceiving the relationship you have you're your surroundings and environment - one that incorporates the process of time and past human experience;
3) Increase awareness in the impact we have on our environment even in our normal daily activities, and how we constantly leave evidence of our individual and group existence in the world around us.
4) The Society of American Archaeology has defined a set of competencies that are standardized for all sections of introductory archaeology taught in the U.S. These consist of:

Grading: 1) Exams: There will be 3 exams in this class, all of which will be a combination of objective and short essay. The 3 exams will count for 60% of your course grade.

2) Research Paper: Research Paper/Project Evaluation: You must do a short research paper of 4-7 pages on some issue in archaeology, with a minimum of 2 published sources other than the text; **or** you may complete a critique of a published field project. You must clear your paper/evaluation with me in advance. This is worth 20% of your course grade.

3) Reaction Papers: You will be expected to write a number of short reaction papers during the semester on questions posed in class, usually related to videos we have seen. These papers should be from 1-2 pages in length. They will count for 10% of the course grade.

4) Participation/Attendance: Class participation is necessary for you to maintain any interest in the class, and attendance is mandatory. They will count for 10% of your course grade.

5) Mobile Rules: Due to a recent problem with cell phones, the following rules are in place: 1) cell phones are off unless you have an emergency—let me know at the beginning of class; 2) text messaging is totally unacceptable in class—if you are caught, you are out of class for that day and listed as not attending.

Grade Weight: Exams(3).....60%	A= 90-100	D=60-69
Res. Paper/Eval.....20%	B= 80-89	F= -60
Part/Attend.....10%	C= 70-79	
Reaction Papers…..10%		

Jan. 17-20: MODULE I: Introduction to Archaeology

Ass: Read Loubser Intro, Ch. 1, 6 / White Ch. 1-2

Relationship of Anthropology and Archaeology / Types of Archaeology

Jan. 23-27: MODULE II: History and Theory--Material Culture and the Mind / The Ugly History of Archaeology (or How Indiana Jones Really Existed) / Theory and Modeling in Achaeology

Ass: Read White Ch. 9-10, 14

Jan. 30-Feb. 2: MODULE III (World Prehistory): A Quick and Dirty Survey / Integration and Conflict—History/text and Archaeology/physical evidence / Current Archaeological Work/Major Regional Issues in Archaeology

Feb. 6-24: MODULE IV (Preliminary work, Reconnaissance and Field Survey): Information vs. excavation Types of Archaeological data / Non-intrusive archaeological data collection / Why we don't want to dig in the ground--types and quality of non-intrusive data recovery / Mapping techniques

Ass: Read Loubser Ch. 2, White Ch. 3, 11-13

EXAM I (Loubser I-2, 6, White 1-3, 9-14)

Feb. 27-March 9: MODULE V (Excavation): "Real" Archaeology=Excavation / Intensive Survey Techniques

Digging very square holes—Excavation Techniques / Excavation methods and 'rules'—why pothunting isn't archaeology / "Laws" of stratigraphy / Context and relationships--stratigraphic interpretation and paradoxes / Playing with broken toys—hands-on archaeology practice

Ass: Read Loubser Ch. 3

March 12-16: MODULE VI (Artifactual and Environmental Analysis): Lab analysis - What do you do with all this stuff? / Classification / Artifact analysis / Soil and environmental analysis

Ass: Read Loubser Ch. 4-5

March 19-23: MODULE VII (Dating methods, Procedures, Accuracy and Logic): Getting dates / Dating in Archaeology / Dating and dangers—where archaeology and pop culture divide

March 26-30: Spring Recess

Ass: Read Loubser ch. 4

EXAM II (Loubser 3-5)

April 2-13: MODULE VIII (GIS Mapping and Interpretation): Making sense of the mess you made / Use of GIS Systems in Archaeology / The Geography of Archaeology / Sizing of geographic features, sites, regions and the impact of GIS systems / Putting people back into archaeology / The case of the migrating pots / Social patterns of artifacts / Environmental Archaeology / Environmental analysis / Economics and Trade

Ass: Read White Ch. 4-5, 8

April 16-20: MODULE IX (Archaeology and the 'real world'): War stories from the archaeological frontier / EIS, for-profit archaeology and big brother / CRM and Archaeology / Archaeology and ethics / Modern issues in Archaeology / Archaeology, Politics and Etnic Identity

April 23-May 4: MODULE X: Review and Relevance of the Seven Principles / Why is Archaeology Important?/ Assessment / Summary

Research Paper DUE 4/28, by 3pm-No Exceptions. If Late= 1 grade off per day

May : EXAM III: 12:45-2:45 in class

SCIENTIFIC METHOD DEFINITIONS

The **METHODS OF SCIENCE** are only tools, tools that we use to obtain knowledge about phenomena.

The **SCIENTIFIC METHOD** is a set of assumptions and rules about collecting and evaluating data. The explicitly stated assumptions and rules enable a standard, systematic method of investigation that is designed to reduce bias as much as possible. Central to the scientific method is the collection of data, which allows investigators to put their ideas to an empirical test, outside of or apart from their personal biases. In essence, stripped of all its glamour, scientific inquiry is nothing more **THAN A WAY OF LIMITING FALSE CONCLUSIONS ABOUT NATURAL EVENTS.**

Knowledge of which the credibility of a profession is based must be objective and verifiable (testable) rather than subjective and untestable.

SCIENCE is a mode of controlled inquiry to develop an objective, effective, and credible way of knowing.

The assumptions one makes regarding the basic qualities of human nature (that is, cognitive, affective, behavioral, and physiological processes) affect how one conceptualizes human behavior.

The two basic functions of scientific approach are 1) advance knowledge, to make discoveries, and to learn facts in order to improve some aspect of the world, and 2) to establish relations among events, develop theories, and this helps professionals to make predictions of future events.

Research Design And Counseling
Heppner, Kivlighan, and Wampold

A **THEORY** is a large body of interconnected propositions about how some portion of the world operates; a **HYPOTHESIS** is a smaller body of propositions. **HYPOTHESES** are smaller versions of theories. Some are derived or born from theories. Others begin as researchers' hunches and develop into theories.

The **PHILOSOPHY OF SCIENCE** decrees we can only falsify, not verify (prove), theories because we can never be sure that any given theory provides the best explanation for a set of observations.

Research Method In Social Relations
Kidder

THEORIES are not themselves directly proved or disproved by research. Even **HYPOTHESES** cannot be proved or disproved directly. Rather, research may either support or fail to support a particular hypothesis derived from a theory.

Scientific research has four general goals: (1) to describe behavior, (2) to predict behavior, (3) to determine the causes of behavior, and (4) to understand or explain behavior.

Methods In Behavioral Research; Cozby

In order to verify the reliability and validity of scientific research it is important to replicate the results. It is the preponderance of evidence that establishes/supports the theory.
http://allpsych.com/researchmethods/replication.html

Excerpt from :

METACOGNITION: Study Strategies, Monitoring, and Motivation

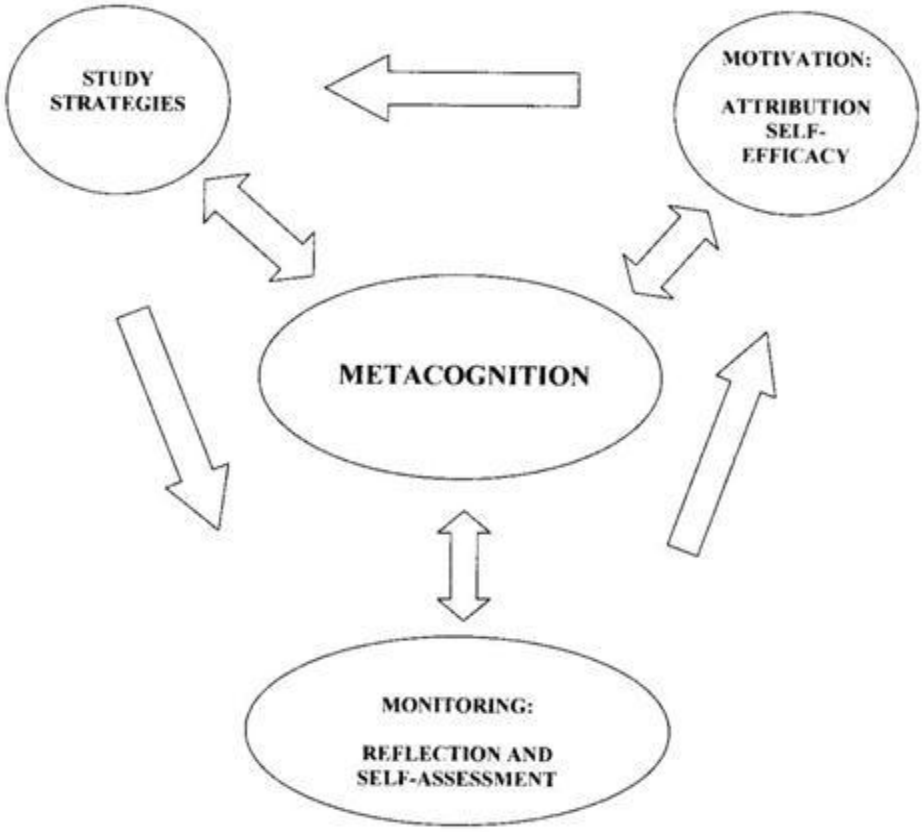
By William Peirce © 2003

A greatly expanded text version of a workshop
presented November 17, 2004, at Prince George's Community College

The main points of the presentation are:

1. **Instructors should explicitly teach the reading, note-taking, and study strategies that will be effective in their courses.**
2. **Instructors should teach students how to monitor and self-assess their use of study strategies.**

Outline



I. Introduction

In general, **metacognition** is thinking about thinking. More specifically, Taylor (1999) defines metacognition as "an appreciation of what one already knows, together with a correct apprehension of the learning task and what knowledge and skills it requires, combined with the agility to make correct inferences about how to apply one's strategic knowledge to a particular situation, and to do so efficiently and reliably."

The more students are aware of their thinking processes as they learn, the more they can control such matters as goals, dispositions, and attention. Self-awareness promotes self-regulation. If students are aware of how committed (or uncommitted) they are to reaching goals, of how strong (or weak) is their disposition to persist, and of how focused (or wandering) is their attention to a thinking or writing task, they can regulate their commitment, disposition, and attention (Marzano et al., 1988). For example, if students were aware of a lack of commitment to writing a long research assignment, noticed that they were procrastinating, and were aware that they were distracted by more appealing ways to spend their time, they could then take action to get started on the assignment. But until they are aware of their procrastination and take control by making a plan for doing the assignment, they will blissfully continue to neglect the assignment.

II. Metacognition and Three Types of Knowledge

To increase their metacognitive abilities, students need to possess and be aware of three kinds of content knowledge: declarative, procedural, and conditional. **Declarative knowledge** is the factual information that one knows; it can be declared—spoken or written. An example is knowing the formula for calculating momentum in a physics class (momentum = mass times velocity). **Procedural knowledge** is knowledge of how to do something, of how to

perform the steps in a process; for example, knowing the mass of an object and its rate of speed and how to do the calculation. **Conditional knowledge** is knowledge about when to use a procedure, skill, or strategy and when not to use it; why a procedure works and under what conditions; and why one procedure is better than another. For example, students need to recognize that an exam word problem requires the calculation of momentum as part of its solution.

This notion of three kinds of knowledge applies to learning strategies as well as course content. When they study, students need the declarative knowledge that (1) all reading assignments are not alike; for example, that a history textbook chapter with factual information differs from a primary historical document, which is different from an article interpreting or analyzing that document. They need to know that stories and novels differ from arguments. Furthermore they need to know that there are different kinds of note taking strategies useful for annotating these different types of texts. And (2) students need to know how to actually write different kinds of notes (procedural knowledge), and (3) they need to know when to apply these kinds of notes when they study (conditional knowledge). Knowledge of study strategies is among the kinds of metacognitive knowledge, and it too requires awareness of all three kinds of knowledge.

III. Metacognition and Study Strategies

Research shows that explicitly teaching study strategies in content courses improves learning. (Commander & Valeri-Gold, 2001; Ramp & Guffey, 1999; Chiang, 1998; El-Hindi, 1997; McKeachie, 1988). Research also shows that few instructors explicitly teach study strategies; they seem to assume that students have already learned them in high school—but they haven't. (McKeachie, 1988). Rote memorization is the usual learning strategy—and often the only strategy—employed by high school students when they go to college (Nist, 1993).

Study strategies are diverse and don't work in every context. For example, reading for information acquisition won't work in a literature course and won't work if students are supposed to critically evaluate an article. But students who have learned only the strategy of reading to pass a quiz on the information will not go beyond this strategy. Study strategies don't necessarily transfer into other domains. Students need to know they have choices about which strategies to employ in different contexts. And students who learn study skills in one course need to apply study strategies in other contexts than where they first learned it.

Students need to monitor their application of study strategies. Metacognitive awareness of their learning processes is as important as their monitoring of their learning of the course content. Metacognition includes goal setting, monitoring, self-assessing, and regulating during thinking and writing processes; that is, when they're studying and doing homework. An essential component of metacognition is employing study strategies to reach a goal, self-assessing one's effectiveness in reaching that goal, and then self-regulating in response to the self-assessment.

IV. Monitoring Problems with Learning

When students monitor their learning, they can become aware of potential problems. Nickerson, Perkins, and Smith (1985) in *The Teaching of Thinking* have categorized several types of problems with learning.

A. Problems with Process; Making errors in encoding, operations, and goals:

1.Errors in Encoding

> Missing important data or not separating relevant from irrelevant data. For example, some literature students will base their interpretation of a poem on just the first stanza.

2.Errors in Operations

> Failing to select the right subskills to apply. For example, when proofreading, some students will just read to see if it sounds right, rather than making separatepasses that check for fragments, subject-verb misagreement, and other errors they have learned from experience they are likely to make.

Failing to divide a task into subparts. For example, some math students will jump right to what they think is the final calculation to get the desired answer.

3. Errors in Goal Seeking

Misrepresenting the task. For example, students in a speech communication class instead of doing the assigned task of analyzing and classifying group communication strategies used in their group discussions will just write a narrative of who said what.
Not understanding the criteria to apply. For example, when asked to evaluate the support provided for the major claim of an article, students will explain why they liked the article rather than apply appropriate evaluative criteria.

B. Problems with Cognitive Load

Too many subskills necessary to do a task. For example, some students might have not yet learned how to carry out all the steps in a complex nursing procedure.

Not enough automatic, internalized subskills. For example, students in an argument and persuasion class might have to check their notes on how to analyze persuasive strategies because they have not internalized the procedure.

C. Problems with Abilities

Lacking the level of needed mental abilities. For example, students are asked to think abstractly about general concepts and issues, but they can only think concretely about specific situations.

A good way to discover what kind of errors students are making in their thinking processes is to get them to unpack their thinking, to tell you step by step how they are going about the task. By listening to how they are doing the cognitive task, an instructor can detect where the student is going wrong. Asking students to describe their thinking processes also develops their metacognitive abilities—a very necessary skill to improve thinking.

V. Metacognition and Motivation

Metacognition affects motivation because it affects attribution and self-efficacy. When students get results on tests and grades on assignments (especially unexpected results such as failures), they perform a mental causal search to explain to themselves why the results happened. When they achieve good results, students tend to attribute the result to two internal factors: their own ability and effort. When they fail, they might attribute the cause to these same internal factors or they might, in a self-protective rationalization, distance themselves from a sense of personal failure by blaming external causes, such as an overly difficult task, an instructor's perverse testing habits, or bad luck. This tendency to attribute success to ability and effort promotes future success because it develops confidence in one's ability to solve future unfamiliar and challenging tasks. The converse is also true. Attributing failure to a lack of ability reduces self-confidence and reduces the student's summoning of intellectual and emotional abilities to the next challenging tasks; attribution theory also explains why such students will be unwilling to seek help from tutors and other support services: they believe it would not be worth their effort. In addition to blaming failure on external causes, underachievers often "self-handicap" themselves by deliberately putting little effort into an academic task; they thereby protect themselves from attributing their failure to a painful lack of ability by attributing their failure to lack of effort (Stage et al, 1998) (Click here for a review and summary of *Creating Learning Centered Classrooms* by Stage et al.)

VI. Metacognition and At-Risk Students

The last two decades have seen a great deal of research directed towards improving the academic success of at-risk students. As McKeachie (1988) explains, the problems are

- Students "enter the higher levels of education with . . . strategies that handicap them in achieving success." (p. 5)
- "[N]either home backgrounds nor schools have helped young adults become aware of alternative ways of approaching learning situations, and of options other than increasing or decreasing one's effort as one approaches different learning situations" (p. 5)
- Teachers give plenty of feedback about the correctness of learning outcomes but not about how to achieve these outcomes.

The use of learning strategies is linked to motivation. When students fail, they tend to assign the cause to something stable and unchangeable—low innate ability—rather than to something they have the ability to change—employing different, more effective, learning strategies.

. . . . . .

C. Strategies for Students to Use for Textbook Reading

1. Answer instructor-provided questions
2. Ask and answer student-generated questions
3. Produce an outline or concept map
4. Write summaries of each section in the chapter
5. Use the SQ4R method: Survey the text, formulate questions, read, record notes, recite, reflect
6. Write notes that elaborate on the textbook:

    a. Cornell method: one column for key words and concepts, a second column for comments, summaries. Useful for comprehension and later recall.

    b. Double-entry method: one column/page for copied passage, adjacent column/page for personal reflections on the passage. Developed by Berthoff (1987); useful for engaging with the text.

    c. Simpson and Nist (1990): seven textbook annotation processes

    - Write brief summaries in the text margins
    - List ideas (causes, effects, characteristics, etc.)
    - Identify examples in the margin (write "EX")
    - Write key information on graphs and charts
    - Predict potential test questions
    - Call attention to confusion with a ? in the margin
    - Underline key words

7. Connect the reading to a past lecture or to prior knowledge
8. Compare/contrast with another reading
9. Critique/evaluate the reading
10. Apply the chapter content to a scenario or case
11. Write self-assessments of your understanding of the reading. See D. below in next list of topics.

D. Sample Reflective Topics for Self-Monitoring and Self-Assessment

Reading for Comprehension

"What do you notice about your reading when you are understanding what you read? What is it that causes you difficulties when you read? In what areas of reading and remembering do you feel most at ease?" (Soldner, 1997)

"Did any parts of the passage confuse me? What did I do to clarify the confusion?" (Gourgey, 1997)

Associative and Affective Personal Response

"How does this poem make you feel? What in your own life might have influenced how you responded to the poem?" (Newton, 1991)