Scaffolded Assignments:
Designing Structure and Support

Center for Instructional and Professional Development
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# Table of Contents

## DEFINITIONS
- Scaffolding Assignments 4-5
- Testimony and Example of Multiple Parts Assignment 6-7
- UWM Example of Scaffolded Multiple Parts Assignment Written Analysis Papers 8
- Example of Increasing Complexity and Testimony: Teaching the Process of Science 9
- Example of Single Scaffolded Assignment: The Photomontage Assignment 10-13

## THEORETICAL FOUNDATIONS
14-15

## EXAMPLES OF SCAFFOLDED ASSIGNMENTS
- UWM Argumentation Persuasion Research Paper 17
- Sociology Paper 18-19
- Collaborative Geography Paper 20-21
- History 22-23
- Health Sciences 24-25
- Cholera and Public Health: Detailed Assignment Descriptions 26-53
- Software Design 54-55

## HOW TO DESIGN ASSIGNMENT SCAFFOLDING
- Using Bloom’s Taxonomy and Perry’s Developmental Theory 57-58
- Process Scaffolding, Critical Thinking, and Troubleshooting 59-62
- Worksheet Samples:
  - Essay 63-64
  - Research Logs 65-66
  - Research Paper (blank and completed) 67-78
- How to Successfully Scaffold 79-84

## HOW TO ASSESS AND PROVIDE FEEDBACK FOR SCAFFOLDED ASSIGNMENTS
- One Instructor’s Example-Case Study: The Narrative in New Media 86-87
- UWM Graduate Class Portfolio Rubric 88-90
- Comm 101 Research Paper Rubric 91-92
- Philosophy Paper Rubric 93-96
- Psychology Paper Rubric 97
- History Paper Rubric 98-100
- Final Research Paper Rubric 101
- Anthropology Paper Rubric 102-104
- Design Project Rubric 105-106
- Group Project Rubric 107
- Peer Feedback
  - Peer Online Feedback 108-109
  - Peer Review for Proposals 110-111
  - Peer Critique-Health 112

## CIPD RESOURCES AND CONTACT
113-114
Definitions
Scaffolding assignments

What it is: Scaffolding assignments involves structuring parts of a single assignment or designing a sequence of assignments so that they gradually increase in cognitive complexity. For example, the first part of an assignment might ask students to summarize an argument; the second might ask students to identify assumptions anchoring the argument; and the third might ask them to compare and evaluate several arguments on the same topic.

Why it might be worth trying: Recent studies focusing on the development of expertise suggest the importance of “deliberate practice.” One important feature of deliberate practice is its graduated structure: it involves mastering easier tasks before tackling more difficult ones. Importantly, deliberate practice also gives the student ample opportunity to receive and act on feedback.

Examples:

- Breaking up an assignment into several parts. For example, rather than handing in one research project at the term’s end, students are asked to write three short papers. In the first they define a problem and identify two or more positions on the problem; the second asks them to evaluate the evidence and assumptions behind each position; the third asks them to draft an argument endorsing an existing position or creating a new one.

- Keeping assignment constant but increasing the difficulty of material (readings, arguments, problems, etc.). For example, students are asked to summarize articles for each week’s readings, but the readings themselves increase in complexity and abstraction.

- Creating a scaffold within a single assignment. An art history professor teaching a freshman class assigns a paper asking students to 1) Describe DeKooning’s painting Woman, I; 2) Explain how it is that the painting represents a woman (or all women); 3) Connect specific formal properties of the painting to ideas about women; and 4). Reflect on their own arguments in numbers 2 and 3 and identify some assumptions about art or creativity.

- For an example of a sequence of assignments that gradually increase in complexity, visit Dartmouth’s Writing Center: www.dartmouth.edu/~writing/materials/faculty/forum/assignments/Spengemann.shtml

Resources:


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<thead>
<tr>
<th>Competence</th>
<th>Skills Demonstrated</th>
<th>Related prompts</th>
</tr>
</thead>
</table>
| Knowledge  | • observation and recall of information  
• knowledge of dates, events, places  
• knowledge of major ideas  
• mastery of subject matter | list, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc. |
| Comprehension | • understanding information  
• grasp meaning  
• translate knowledge into new context  
• interpret facts, compare, contrast  
• order, group, infer causes  
• predict consequences | summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend |
| Application | • use information  
• use methods, concepts, theories in new situations  
• solve problems using required skills or knowledge | apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover |
| Analysis | • seeing patterns  
• organization of parts  
• recognition of hidden meanings  
• identification of components | analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, explain, infer |
| Synthesis | • use old ideas to create new ones  
• generalize from given facts  
• relate knowledge from several areas  
• predict, draw conclusions | combine, integrate, modify, rearrange, substitute, plan, create, design, invent, compose, formulate, prepare, generalize, rewrite |
| Evaluation | • compare and discriminate between ideas  
• assess value of theories, presentations  
• make choices based on reasoned argument  
• verify value of evidence  
• recognize subjectivity | assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize |

teachingcommons.depaul.edu/
Testimony and Example of Multiple Parts Assignment

Shamira M. Gelbman
Assistant Professor, Department of Politics and Government

Probably the most important instructional innovation I have incorporated into my courses is carefully scaffolded research and writing projects in which I guide students through preliminary proposal and outline, initial drafting and peer review, and revision processes culminating in polished research papers. Scaffolding assignments in this way transforms them from mere assessment instruments into extensive-form learning experiences through which students gradually gain their bearings as novice researchers and writers. In my experience, moreover, such scaffolded assignments are a win-win proposition, as the end products they yield are by and large superior to papers that are not similarly developed, enhancing both my grading experience and the students’ assignment grades and sense of accomplishment.

http://my.ilstu.edu/~sgelbma/innovations.html
Throughout the semester, you will be working on a ‘scaffolded’ paper, generally referred to as a Rhetorical Analysis. The goal of this assignment is to help you develop your written language skills and become a more effective communicator, by completing a thorough analysis of a scientific article. To analyze an article rhetorically means to examine how the author succeeds or fails to communicate his or her ideas to readers.

The rhetorical analysis paper will be broken into four parts and you are required to submit each of the four parts by the due date and time (**11:59 PM (Eastern Time) on the date specified**). If you experience difficulty submitting your response, please contact your Instructor immediately. **Scores from all four parts of this assignment will count toward your final grade.**

Your paper will be submitted in four parts:
- Part 1. Abstract (10 points)
- Part 2. Thesis and outline (10 points)
- Part 3. Rhetorical Analysis Draft (10 points)
- Part 4. Rhetorical Analysis Final Paper (20 points)

Each part of your paper should build upon the preceding part and you must submit each part by its individual due date in time to receive a grade. This scaffolded format is intended to encourage revision and help you to achieve your best final grade. Part 4 will be your rhetorical analysis in its finished form.

**Late assignments:** If you do not submit any one part of this assignment by the due date, you have 24 hours (after the due date) to contact your Instructor to explain your situation AND submit your late response. Responses submitted within this 24-hour window will be worth only half credit; in other words, the most you can earn for a late response is 5 points. You will receive 0 points for all responses submitted after the 24-hour window.
Example of Scaffolded Multiple Parts Assignment

Written Analysis Papers

You will complete three analysis papers (Parts I, II, and III) designed to sharpen your skills in analyzing and critiquing urban planning proposals.

By the completion of all three parts, you will have analyzed a proposed CDS plan for your intern area, researched the context, history and issues, created your own recommendations for the proposed plan, and finally, reconsidered all of your recommendations after engaging in an exchange with the Urban Planning Architectural candidate.

Part I: Neighborhood Context Analysis - Due October 19th (2-3 pages)
- Introduce your designated Main Street neighborhood.
- Compare your neighborhood to the Main Street Model and identify and support what is or is not working
- Discuss the assets and challenges of revitalization in this area

Part II: Main Street Model Application/Analysis - Due November 16th
- What are the pros and cons of MSM structure in your neighborhood?
- Support each pro and con with evidence and facts.
- What could be done differently and how?

Part III: Due December 14th

- Review the proposed CDS image/design-take notes

Criteria are:

Papers must be in length, size 12 font, one sided, paper numbered, and submitted by electronic copy. Include proper citation of sources using APA style.
We used a constructivist approach to teaching (Dewey, 1933; Duckworth et al., 1990; Brooks and Brooks, 1999; Leonard, 2000; Fink, 2003; Shepard, 2005), whereby we successively introduced increasingly complex activities that required students to practice and integrate many different skills and allowed them to sequentially build, test, and refine their conceptual understanding.

We also put skills in context—giving students just enough content to allow them to practice skills. Class instruction about a particular skill always preceded graded assignments that required students to practice that skill. After an initial exercise that required the student to use a skill (i.e., reading primary literature, scientific writing, etc.), students were provided with a grading rubric (Supplemental Material B, SM2), given detailed instruction on the science process skill that was part of the initial exercise, and then introduced to new science content.

The same skill was then incorporated into subsequent assignments, allowing students to practice skills in the context of different content. For example, in class we would introduce basic statistics and appropriate ways to display data graphically, followed by an assignment that required them to properly use these skills to make inferences and pose future experiments.

Iterative practice and frequent assessment of students' skills helped to reinforce the key learning objectives of the course, while the presentation of new content helped foster their interest in science.

As a result of these scaffolded activities, students showed significant gains in their abilities to generate graphs, interpret data, design experiments (Dirks and Cunningham, 2006), write in a scientific manner, and understand the purpose and structure of scientific literature (data presented below).
The Photomontage Assignment: Using Images to Engage Students in Creative and Critical Media Literacy

Linda Buturian is one of three PSTL instructors who were mentored by Patricia James, Associate Professor of art, in teaching the photomontage assignment, as part of the curriculum of the PsTL 1312 course, “Creating Identities Through Art & Performance.” James, now retired, designed and taught the Photomontage and I Am writing.

The Assignment

In my 1312 course, the photomontage is the third major assignment in the semester that asks students to use a combination of images and text to reveal an aspect of their identity. They create the photomontage by juxtaposing pictures cut out from magazines and old books, then arranging them by hand into a visually compelling image, which they then glue to paper and take to a copying center to produce a color copy. Students write an accompanying “I Am” piece that sheds light on the meaning of their photomontage.

I encourage students to concentrate on expressing one aspect of their lived experience, such as their ethnic traditions, gender issues, spiritual beliefs, or economic challenges. With scissors in hand, they sift through piles of magazines to choose pictures that compel them, stir their imaginations, and help them reveal their ideas. We relate our discussions about metaphorical thinking to their concepts: How do you use shapes, colors and objects to comment on what the media conveys about body image, or the cultural traditions around marriage? Magazine ads and articles abound with pictures that contain archetypal images—birds, crosses, clocks, hands, rings, nails, lips, and mountains. They are a rich, chaotic mess of possibilities.

Students often ask if they can use Photoshop or some equivalent computer program, but art professor Pat James helped me to understand that the manual process of cutting, arranging, and pasting engages a different part of the brain, and I have seen the rewards of students reviving skills they’ve been trained in since grade school, but haven’t had many opportunities to employ in their college work.
I am drawn to the democratic, leveling nature of the photomontage assignment, as students at any artistic level can produce visually powerful pieces. Most have created collages, but few have designed a coherent image out of seemingly unrelated pictures. Students who come in with artistic experience can challenge themselves to move their image in a more surreal yet congruent direction, and those who feel they “aren’t creative” are equipped to produce art they are proud of.

Learning Objectives

Creative and Metaphorical thinking.

“Classes at the U. aren’t a place to be creative,” commented a sophomore business major to his classmates while he was reflecting on the work he did in the 1312 course. His statement struck me, as did the matter of fact way he said it, and how the others nodded in agreement. Repeatedly, students have expressed how happy they are to have a class where they can engage the “creative” side of themselves. I relate the photomontage to the University’s Student Learning Outcomes that they are to have achieved by the time they receive a bachelors’ degree; to “understand the role of creativity, innovation, discovery and expression across disciplines.” And I encourage them to see how vital their creativity is toward the other academic work they are doing. As Betty Edwards writes in her book, Drawing on the Right Side of the Brain, “Creative solutions to problems, whether personal or professional, will be accessible through new modes of thinking and new ways of using the power of your whole brain” (6).

“Problem solving”: From Draft to Final Product

Making a photomontage is as challenging as creating an essay for a class assignment. Like verbal texts, the visual text of the photomontage goes through a revision process. Students create a draft where they practice shuttling between communicating ideas and navigating the techniques of this genre: noticing the negative space around images, taking in contrasts and hues, deciding if and when to incorporate words, then stepping back and seeing if their concept or idea is emerging. And like writing, what the student chooses to edit out is as important as what they keep.

At some point in the process, most of them get stuck. I walk up to a student staring down at a pile of pictures--a cranberry-colored chair, the Milky Way in a dark sky, a cathedral spire, and a geological illustration of sedimentary rock. I sit down, motion for a few nearby classmates to join us, and listen as the student describes what concept s/he is moving toward. We shift the pictures around and make suggestions. Collaborative learning is at the heart of this assignment. Students give each other feedback on their drafts, and like the peer reviewing process for essays, students need guidance for how to give helpful feedback. Once I’ve modeled strategies for feedback, so many of them offer suggestions and insights I wouldn’t have come up with. Through time, input, and persistence, students move further along this mysterious process of metaphorical thinking that is part intellect, part intuition. As Lakoff and Johnson state, “These endeavors of the imagination are not devoid of rationality; since they use metaphor, they employ an imaginative rationality“(193).
Example of Single Scaffolded Assignment
“Understand diverse philosophies and cultures within and across societies” (U of M Student Learning Outcome)

Some students choose to incorporate personal photos or images into their photomontage. While working on her image at home, a student was talking with her dad, and as she interspersed photos of family members, her father relayed memories of growing up picking cotton in the south, and other stories of her relatives she’d never heard before, involving slavery, rape and north-south hostilities. Through the creation of her photomontage, this student perceived her own story in a new light, her family history merging with the country’s history, and as she shared her photomontage and writing, she in turn educated us.

Another student used copies of handwritten letters and photos which helped her create a photomontage that visually conveyed the experience of meeting her Korean birth father for the first time when she was sixteen, after being adopted and having grown up in a white, suburban family. A multigenerational odyssey is revealed in one image. Others allow their “imaginative rationality” to choose and arrange pictures and then discover what they reveal about themselves—a kind of spelunking of the self. The photomontage and writing assignment is a window into the tumult of responsibilities, hopes, and desires students navigate to participate in our classes.

The Writing

The accompanied text is referred to as “I Am” writing, which helps emphasize that the words give voice to the image they’ve created. This liberates most of the students to create some of the strongest writing they produce in the course. The writing goes through a drafting process and since it is in response to the photomontage, it tends to bypass a lot of the “shoulds” that often hinders access to powerful, nuanced writing. Many students move beyond the scaffold of “I Am” and create poetic lines of their own choosing.

Critical Media Analysis

The photomontage, along with harnessing vital creative energies, also engages students in critical media analysis. Sifting through magazines and arranging pictures help students slow down and focus on commercial images they have been weaned on, so that they can creatively and intellectually analyze and have agency over images, rather than be carried along and hence manipulated by these currents of commerce. Indeed, most of the images these students have been confronted with are seedpods sprung from the tree of capitalism. There’s nothing inherently wrong with that, but an image designed to sell and unconsciously shape public perception differs from critical media analysis of images, or, in the case of the photomontage assignment, accessing the creative power of images to reveal students’ identities.

We discuss how public discourse is often shaped by photographs and video footage. As Allen Ginsberg put it, “Whoever controls the media, the images, controls the culture.” As students move into uncertain futures, confronted with complex cultural, economic, and environmental challenges, they need images to help them envision hopeful and inclusive scenarios. Engaging with and utilizing both verbal and visual texts helps them become active participants in intellectual discourse.
Communicating Effectively (the premiere)

On the day the photomontages and writings are due, I have students sitting at the long tables in the back of the art room. They take turns discussing the process of creating the photomontage, reading their writing, and getting responses from others at their table. Then they move around and view the others. All students had the same assignment, most all used the same magazines, and yet no two images are alike. They are unrepeatable, like visual imprints of their identities. It is often quiet as students walk around the tables, absorbing each other’s art. They are a diverse group of students from different disciplines and years at the university. The photomontage and writing usher their rich lived experiences and ways of knowing into the classroom. In a sense they are moving signifiers, with their personal and public identities, and they know more than words can convey.
Theoretical Foundations
Theoretical Foundations

Scaffolding must begin from what is near to the student's experience and build to what is further from their experience. Likewise, at the beginning of a new task, the scaffolding should be concrete, external, and visible. Vygotskian theory shows that learning proceeds from the concrete to the abstract.

- Vygotskian Theory: Learning proceeds from the concrete to the abstract
- At the beginning of a new tasks, the scaffolding should be concrete, external, and visible.

Adapted from *Strategic Reading: Guiding Students to Lifelong Literacy* by Jeffrey Wilhelm, Tanya Baker, and Julie Dube. Copyright © 2001 by Jeffrey Wilhem, Tanya Baker, and Julie Dube. Published by Heinemann, a division of Reed Elsevier Inc., New Hampshire, USA.

http://www.myread.org/scaffolding.htm
Examples of Scaffolded Assignments

- Individual Research Projects
  - Argumentation paper
  - Sociology paper
  - Urban Studies Written Analysis Paper
  - History paper
  - Cholera and Public Health

- Scaffolding Research Skills

- Team/Group Projects:
  - Scaffolding Software Design
  - Scaffolding Open Ended Group Projects

- Online and Blended Learning
  - Scaffolded Assignment-Blended Learning
Argumentation-Persuasion Research Paper Outline

Objectives:
Upon successful completion of this research project assignment, students will be able to:

- Define a problem
- Select and analyze research
- Use research to support or refute your point of view
- Formulate a research-based argument advocating your point of view
- Cite information appropriately using MLA style within the paper and a works cited page
- Critique the writing and arguments

<table>
<thead>
<tr>
<th>Due Date</th>
<th>Assignment</th>
<th>In/Out Class</th>
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<tbody>
<tr>
<td>11/3</td>
<td>Pre-Writing</td>
<td>Complete activity in-class</td>
</tr>
<tr>
<td>11/10</td>
<td>Research</td>
<td>Complete activity in-class</td>
</tr>
<tr>
<td>11/17</td>
<td>Critically Analyze</td>
<td>Complete activity in-class</td>
</tr>
<tr>
<td>11/24</td>
<td>Construct Thesis Statement &amp; Outline</td>
<td>Complete activity out-of-class – submit via email</td>
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<tr>
<td>12/1</td>
<td>MLA Formatting</td>
<td>Complete activity in class</td>
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<tr>
<td>12/1</td>
<td>Peer Revision</td>
<td>Bring four hard copies of rough draft &amp; works cited page to class</td>
</tr>
<tr>
<td>12/8</td>
<td>Argumentation-Persuasion Research Paper Due</td>
<td>Bring a clean hard copy of your paper to class. Place this in a file folder with all your pre-writing and completed activity sheets in the opposite pocket of your final draft.</td>
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Scaffolding Activities for Argumentation-Persuasion Research Paper

Pre-Writing: 10 pts (Due 11/3)
Pre-writing activities such as mapping, brainstorming, etc. identify an issue or problem.

Research: 10 pts (Due 11/10)
In a computer lab, participate in a library orientation session to learn how to locate good, reliable sources. After the session, select and analyze research that addresses a specific issue or problem.

Critically Analyze: 10 pts (Due 11/17)
Pulling information from the research gathered, complete a pro/con worksheet listing important information that either supports or refutes the issue or problem. Worksheet information needs to include a source (MLA formatting is not necessary at this point).

Construct Thesis Statement & Outline: 10 pts (Due 11/24 – submit via email)
Based on this list of information, identify your point of view and compose a strong thesis statement that will frame the argument. Begin outline of the paper by structuring the argument.

MLA Formatting: 10 pts (Due 12/1)
Based on the information gathered, construct a works cited page using MLA format. (This will follow a lecture on proper MLA format and how to apply it to your writing). Review pro/con worksheet to revise citations appropriately for in-text citing.

Peer Revision: 10 pts (Due 12/1)
Working in small groups, everyone will peer revise hard copies of argumentation-persuasion papers and their works cited page.

Instructions for final paper

- Refer to the Argumentation-Persuasion Research Paper Rubric for specific directions for final draft
- Final copy should be formatted using MLA format (12pt font, 1-inch margins, MLA heading format, double-spaced)
- Scaffolding activities above contribute directly to the final paper. Failure to complete these activities may affect your overall grade on the final paper
- Recommendations received throughout the scaffolding activities above should be integrated into your final draft
Sequencing and Coaching the Research Paper

THE GOAL:

The Final Research Paper (10-12 pages) is an opportunity for you to make an argument about a topic of your choice, based on and informed by scholarly articles and/or books that relate to your topic.

To this end, your paper is actually about a research problem, and your argument defends your answer to this research problem. Thus, the most important part of your paper will be the thesis statement. This is a “thesis” paper, similar to what you may have heard called an “argumentative paper.” That means your paper will be trying to convince your reader of some main point or argument (the thesis). You will be using your paper to demonstrate to readers that if they were as smart as you and had done the research that you will have done, they would address this research problem the same way as you do. They would agree with your thesis statement, the position you are defending with your paper.

As examples, look at the following:

Problem: What are the consequences of individualism in the United States?
Thesis: Civil involvement is limited.

Problem: What accounts for the continuing existence of the underclass?
Thesis: While racism was the primary cause of the development of the underclass, the continued oppression of black people owes more to class dynamics than racial dynamics.

Problem: What are the dimensions in which class matters?
Thesis: There are two dimensions of “class” in the contemporary world: one is based on economic capital, and one is based on cultural capital.

(These will sound more familiar as the course goes on!)

Constructing a Research Problem:

There are several ways to construct a research problem from the general topic area that you have chosen. The research problem can usually be stated as a question, as shown above. Decide which aspect of the topic most interests you. Practice writing possible questions, which address various aspects. Pick the one which seems most answerable and most interesting! Remember that you are going to have to make an argument which answers this question from the research that you do. Your research problem can be centered around social phenomena (“How has the role of housewife changed in the last 30 years?”) or policies (“Should gender segregation be eliminated in elementary schools?”). In either case, you will take a stand on this question in your thesis statement.

Your Thesis Statement:

Keep in mind that your thesis statement should reflect two things: both your real, actual opinion, and your research. These two are related; your real, actual opinion should be developed from the research that you read. The thesis statement is the motor of the paper; it drives the rest of the paper. In other words, the rest of your paper is one big demonstration of the truth of your thesis statement.
The Rest of the Paper:
Again, the main body of your paper will demonstrate and illustrate the truth of your thesis statement by referring to outside sources, probably including some of the articles you found for your Library Assignment.

STEPS ALONG THE WAY:

*Topic Area Statement*

*Library Assignment*

*Writing Workshops*
The writing workshops I've designed will help guide you through the process of developing papers. They focus on the larger issues earlier in the semester, and more specific editing/revising issues further on.

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<thead>
<tr>
<th>Date(s)</th>
<th>Topic</th>
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<tbody>
<tr>
<td>February 5</td>
<td>Research Problems</td>
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<td>February 12 and 17</td>
<td>Research Process/Library Skills</td>
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<td>February 12 and 19</td>
<td>Arguments</td>
</tr>
<tr>
<td>March 5</td>
<td>Peer Review</td>
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<tr>
<td>March 26</td>
<td>Transitions and Structure</td>
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<td>April 2</td>
<td>Outlines</td>
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<tr>
<td>April 16</td>
<td>Citing and Quoting</td>
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**A Collaborative (Sequenced Research) Paper in Geography**

During our field trip on Thursday, September 21, we will locate six different places on or near the UW campus. Each group of three students will study one of these places throughout the semester from as many geographic perspectives as possible. You will first identify the various geographic realms at your site; consider the natural as well as the cultural attributes. To do so, you will find it helpful to look at your study site from the viewpoints of as many different types of geographies as possible (e.g., biogeography, cartography, climatology, economic geography, geomorphology, historical geography, population geography, geography of recreation, tourism and sport, regional development and planning, remote sensing, transportation geography, urban geography, etc.).

As you are working on your projects, think about what you have learned from the readings for this course: What do geographers do? What kinds of questions do they ask? What techniques do they use to answer questions? You will then use these approaches to find out more about your study area.

I expect these projects to represent substantial effort on each of your parts, and I will be reading your work for both content and technical aspects. I have not set a minimum or maximum number of pages for your final document, but I offer possible page lengths below. A general guideline is to be as thorough yet concise as possible. Bring questions and comments about the project to me as they arise. You will work toward your final group project in stages:

**Step 1, due October 5:** a description of what geographic realms you will study (1-2 pages). In the description you submit as a group, highlight the perspectives that you will take and why you have chosen them. Indicate what geographical questions you wish to answer and how you plan to do so (your methods). Also describe who in your group will research each perspective and when you will meet as a group to consult, compile, and complete each part of the assignment (your timetable).

**Step 2, due October 19:** an annotated bibliography of the references that you are using to answer your geographical questions (5 sources per student, 3-4 pages total). An annotated bibliography is a list of sources--using the notation I will describe in class--with a few summary sentences about each source. We will discuss an example during class. Each student is responsible for at least five sources, and you will put your references together into a bibliography for the group.

**Step 3, due 16 November:** draft of group project, including introduction written by group (1-2 pages) and individually written sections (10 pages each). Although I expect that much of the work that you turn in as your draft will be text, I encourage you to be creative in the types of material that you incorporate and the ways in which you present your findings (e.g., maps, photos, graphs, etc.). In your group introduction, clearly define the focus of your group project and map out for the reader the individually written parts. Make sure that each of your individual sections contains a brief introduction that outlines the topics you will discuss and a more extensive conclusion section that discusses how your part relates to the project as a whole and to the larger themes in geography that we have read about and discussed this semester. I am looking for specific links to the readings, i.e., properly cited quotations and paraphrases that support your conclusions. Make sure that you end your sections with your own bibliography. I will return these drafts after Thanksgiving for you to revise with your group.
Step 4, due either 7 or 14 December: a detailed presentation of your particular area (10 minutes per group member). Think carefully about what is important to say to the class about your project. Most of you will not have time to share all of your research findings, so pick out the essential facts pertaining to your site. Visual aids such as overheads, blackboard outlines, and videos will be especially effective. The first person to present in a group should outline the various sections to follow, and each member should introduce and outline his/her section. Practice your presentation beforehand to ensure that you can establish eye contact and stay within your ten minutes with time for audience questions. In hearing from each group, we will develop a mental picture of a larger area . . . a transect across campus. We will try to understand the spatial patterns of similarities and differences in the campus environment.

Step 5, due 14 December: final draft of entire group project (approximately 30 pages). Please submit your final draft with the November draft and my comments.
A research paper has multiple steps. You need to start on them before the paper due date. Your grade will reflect all these assignments.

Write a paragraph with your first thoughts about the research paper project. Tell me about your past experience, if you have any, with research papers or other substantial independent writing assignments. I am less interested in the exact number of pages you have written, and more in your comments on the experience, your strengths and weaknesses, and anything that you want to focus on this time (kinds of sources, improving your writing, avoiding procrastinating, etc.). If you want, tell me about possible topic areas you find interesting.

Then add a second paragraph reflecting on one of the sample papers. Organize your comments around the questions at the bottom of that page. Focus not on the content of the paper, but on how the author went about constructing it.

Submit by e-mail by 6 p.m. Friday, September 20, to clcarson@socrates.berkeley.edu. Send it in the body of the message, not as an attachment; I need the information in a fileable form. (If your e-mail program or internet service provider conventionally sends text as html attachments, then cut and paste into the body of the message. Hotmail seems to be a particular problem.) Include your name so I can identify you; ideally, set the preferences in your software to put your name in the "sender" field.

Provide a one- or two-sentence description of your topic (if you choose, a tentative title as well). If you are exploring a number of topics, tell me what you are considering and why. Briefly describe the sorts of sources you are looking for. Add more information or include questions if you like.

Submit by e-mail by 6 p.m. Friday, October 4, to clcarson@socrates.berkeley.edu. Send it in the body of the message, not as an attachment. Include your name.

Provide a list of your likely sources, broken down into primary and secondary categories. For published material use proper bibliographic format. Italics or underlining is not necessary in the e-mail, but all other elements are. (A list of sources requires bibliographic, not footnote or endnote format; see the guidelines.)
Annotate each source in one to three sentences: What kind of material is this, what will it be good for, where is it located (e.g., library call number) or how will you get hold of it. You do not need to have digested it yet, but tell me how you expect to use it.

Submit by e-mail by 6 p.m. Monday, October 28, to clcarson@socrates.berkeley.edu. Send it in the body of the message, not as an attachment. Include your name and paper topic.

Abstract (November 6)

Come up with a tentative paper title. Provide a one-paragraph summary, in formal, polished prose, of your likely argument and findings. If you are not yet sure, give it a stab. You can use this as the starting point for your paper's introductory paragraph.

Submit by e-mail by 6 p.m. Wednesday, November 6, to clcarson@socrates.berkeley.edu. Send it in the body of the message, not as an attachment. Include your name.

The Paper Itself (November 25)

The paper itself (9-12 pp.) is due at the beginning of class on Monday, November 25. This is the Monday before Thanksgiving. The paper must be typed, double-spaced in normal-sized fonts with reasonable margins. It may not be submitted by e-mail or in any other electronic form. Every day it is late will reduce its grade by 2/3 of a mark.

Back to:
History 138 homepage
Prof. Carson's home page
Research paper guidelines
Introduction to the research paper
Constructing a research paper
Finding a topic and sources

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The following assignment and schedule demonstrate scaffolding leading up to a high-stakes assignment. This project was designed by Professor Jane Levitt for her LEH 301 course, “Health Disparities in the United States.” Writing Fellow Tina Harris worked with her to develop the assignments and assist students during class time.

I. Guidelines for the assignment

Your paper must reflect the focus of this course on health disparities. You are expected to relate three variables such as socio-economic characteristics (e.g. income, education, access to insurance), personal/demographic characteristics (e.g. race, ethnicity, age, gender) and a health condition or disease (e.g. asthma, diabetes, obesity, substance abuse) to examine why a health disparity exists.

You must read at least two articles from academic, peer-review journals. In addition, you are welcome to use more articles or other materials, like books, newspaper articles, and information from reputable websites. Also include the perspective of someone you interviewed. Including some statistical data would be a good idea.

The paper is not a summary of the articles and other information you have read, but rather a synthesis and analysis of what other writers have said about the topic you have chosen. The paper should go beyond description of your topic to analyze (critically evaluate) your topic.

I am looking for a clear thesis statement, supporting arguments and logical thinking. The paper must be typed, double-spaced, using font size 12. The footnotes and references should be in APA style. Read the paper aloud to be sure it is coherent and says what you want it to say. Review and edit your paper for English grammar and spelling.

This is an opportunity to do some independent research and explore a subject on your own. I value an interesting topic, a thoughtful approach to an issue and a paper based on data from appropriate professional literature put into your own words.

I hope you enjoy the assignment. If you find the material interesting, I probably will too.

II. Scaffolding toward the high-stakes assignment

Mar. 7 Developing a research topic. Class meets in the library.
In class: Begin your five page research paper by identifying a health condition you are interested in finding out more about. Focus on one population (e.g. by gender or race/ethnicity) and a socio-economic factor (e.g. income, education, occupation, geography). With the help of the librarian you will use the library time to explore resources for your topic. You will also have a chance to meet in pairs to review your research question. For homework, you will need to choose one article to read and write a summary – one paragraph giving the main ideas in the article.
Reading: article from library
Writing: (1) One paragraph summary of article chosen from last week’s class in the library. (2) In one sentence, identify your research question.
Class Exercise: clarifying the research question and writing a thesis statement – students work in pairs, share three foci and your research question. Then meet in group and turn that question into a thesis statement. Then asking each other questions; identify supporting ideas – result: outline for paper
Reflective Writing: For you, what is the most difficult part of writing a paper?

Mar. 21 Tina and Jane review progress with individuals.

March 28 No class

March 30 First draft of paper due

Apr. 4 Return first draft of paper

April 11 Paper due, accompanied by first draft
CHOLERA
AND
PUBLIC HEALTH
COURSEWORK
ASSIGNMENTS
GCSE HISTORY COURSEWORK ASSIGNMENTS

Teacher Information

Introduction:

These assignments comprise sources, questions and mark schemes which will enable your pupils to fulfil the coursework requirements in history for Edexcel Foundation specifications for first examination in summer 2003. You may use these assignments as they stand. They have been designed to assess the full range of grades targeted by the syllabus (Grades G-A*). Assistance may be given in class to aid the comprehension of the sources.

You may also adapt these assignments if wished by:

- Providing additional or replacement sources
- Providing additional or replacement questions

However, if you wish to make change you should submit these to the History Subject Officer for approval to ensure that revised sources or questions given candidates appropriate opportunity to meet the targets specified at the appropriate level.

Management of the assignment:

The assignment has been designed to accommodate some flexibility of classroom practice. The following points should be borne in mind:

- Although all the questions may be tackled as part of a single task, this is not necessary. The timing of individual questions within an assignment may be staggered over a period of time and integrated into the programme of study.

- Candidates may use the sources provided in the pack as part of their preparation for Assignment 1 but this is not a requirement.

- Your candidates should draw upon their contextual knowledge when using the sources for Assignment 2. The historical content listed below should be familiar to candidates before they attempt to answer the questions.
Cholera and Public Health

This assignment should arise from a teaching programme designed to occupy approximately half a term. Before candidates begin this assignment they should have knowledge of:

- Changes in the size, composition and distribution of the population.
- The impact of industrialisation on urban growth, living conditions and the environment.
- Attempts by local and central government to improve public health: the role of Chadwick.
- Changes in medical knowledge.

Introduction

The rapid growth of towns in the late eighteenth and early nineteenth centuries caused many problems. Among the greatest problems faced by the authorities both at a local and a national level during this period was the issue of public health. Overcrowded housing conditions, poor sanitation, inadequate supplies of fresh water, and the effects of poverty created health problems. The state of knowledge on the cause of disease was basic and often inaccurate. Many doctors and administrators such as Edwin Chadwick still believed in the “miasmatic” theory of disease. Unaware of the existence of germs it was believed that vapours in the air carried disease and the risk of infection. Efforts to improve standards of housing and sanitation in towns met with the opposition of vested interests, ignorance and lack of organisation at all levels.

Of all diseases common in the nineteenth century perhaps the most feared was cholera. Cholera originated in India in the early years of the nineteenth century and reached England in 1817 for the first time. There was no known remedy for the disease. Doctors and local authorities seemed powerless to stop or slow its progress. The most serious outbreak occurred in 1831-1832 but there were others in the 1840s, and this was one of the main factors in persuading those in authority that something should be done. Over the next few decades a series of steps such as the Public Health Act of 1848 were taken to improve public health. Dr John Snow established the link between the spread of cholera and infected water supplies.

In this assignment you will investigate the impact of cholera and the changes that resulted from it.

The streets most densely populated by the poorer classes are full of filth where the direct rays of the sun never reach. In some of the courts I have noticed heaps of filth, amounting to 20 or 50 tons, which, when it rains gets into some of the cellar dwellings. A few public necessities (toilets) have been built, but too few for the population.

Piggeries were also pointed out to me which made things worse. The absence of dustbins was everywhere a cause of great annoyance, and nothing horrified me more than the attempt to keep the refuse of privies for the purpose of selling it to neighbouring farmers.

**SOURCE B:** A description of Manchester taken from the ‘Report of the Committee on the Health of Towns 1840.’

Manchester has no building Act, and as a result, with the exception of certain central streets, over which the Police Act gives the Commissioners power, each proprietor builds as he pleases. New cottages...huddled together row behind row, may be seen springing up in many parts,... the authorities cannot interfere. A cottage row may be badly drained, the streets may be full of pits, brimful of stagnant water, the receptacle of dead cats and dogs, yet no-one may find fault.
SOURCE C: a cartoon from *Punch* in 1852 called ‘A Court for King Cholera.’

SOURCE D: A group of industrial cottages in Preston in 1844. The privies are at the end of the yards and drain into an open trench which runs down the middle. The landlord arranged for the trench to be cleaned out twice a year. The contents were piled up nearby.

Cholera was a new disease to the English and the first national epidemic since the seventeenth century plague. It reminded the Victorians that their society, however progressive, was not immune to the plagues of the past. Roughly 32,000 people died from cholera in (the first epidemic in) 1831-2, 62,000 in the epidemic of 1848-9, another 20,000 in 1853-4 and about 14,000 in 1866-7. But as important as the number dying was the speed with which cholera could strike. The victim could be dead within a few hours....

SOURCE F: A description of the effects of cholera from the Sunderland Herald, October 1831.

The following are the early symptoms of the disease... giddiness, sick stomach, slow or small pulse, cramp at the top of fingers and toes... Purging... diarrhoea, vomiting or purging of a liquid like rice-water... the face becomes sharp and shrunken, the eyes sink and look wild, the lips, face, neck, hands and feet, and the whole surface of the body a leaden, blue, purple, black.... The skin is deadly cold and often damp, the tongue always moist, loaded: coated often white and loaded, but flabby and chilled like a piece of dead flesh. Breathing is often quick but irregular... urine is totally stopped.

All means to restore the warmth of the body should be tried without delay, apply poultices of mustard to the stomach... in very severe cases 20 to 40 drops of laudanum may be given....

In the treatment of this disease it is necessary to state that no specific remedy has yet been discovered nor has any cure been sufficiently successful to recommend its use... but the greatest confidence may be expressed in the intelligence and enthusiasm of the doctors of this country who will surely find a method of cure.
SOURCE G: From an advertisement that appeared in the *Sunderland Herald* in November 1831.

**IMPORTANT!!!**

At all seasons of the year, but particularly so at the present Period, whilst the Atmosphere is undergoing sudden Changes, generating and increasing infectious disorders, and especially whilst the Public Mind is distracted with Fears lest that dreadful Scourge to Mankind,

THE CHOLERA MORBUS,

should visit this Neighbourhood, it cannot be too generally known that the Ravages of that most formidable Disease may be arrested, and the Progress of Fevers, of the most dangerous and contagious Character, suspended by the Free Use of the Concentrated Disinfecting Solutions of

**CHLORIDE OF LIME**  
& **CHLORIDE OF SODA,**  
of a Uniform Strength,  
Prepared with the greatest Exactness, and sold Wholesale and retail by  
JOHN RITSON  
CHEMIST AND DRUGGIST,  
NO.4 High Street, Sunderland.
SOURCE H: From a letter by Dr Brown to Lord Londonderry. It was sent by Lord Londonderry to the *Sunderland Herald* in November 1831. Londonderry was a wealthy coal mine owner who stood to lose financially if the measures taken to control the spread of cholera were kept in place.

My Lord,

...The conclusions which I have reached, from all I have witnessed are -

1. That the disease has certainly not been imported.
2. That it is not contagious.
3. That it has attacked... the lowest order, living in the worst situations and... broken down by previous disease, old age or intemperance.
4. That it is very much subsiding.
5. The commercial restrictions are totally unnecessary as the disease is not communicable...

The ship owners and merchants are in a terrible state... ships from here are subject to fifteen days quarantine.

Your Lordship’s Obedient Servant

J Brown


The various forms of epidemic disease... amongst the labouring classes are caused by atmospheric impurities produced by decomposing animal and vegetable substances, by damp and filth, and overcrowded buildings.

The formation of all habits of cleanliness is obstructed by defective supplies of water.

The annual loss of life from filth and bad ventilation are greater than the loss from death or wounds in any wars in which the country has been engaged in modern times.

The expense of Public drainage and water supplies would be saved again by reducing the existing costs of sickness and mortality...

We do not shrink from saying that the responsibility for this loss of life rests mainly upon those who have the greatest power to remove it - the corporation.... They can get powers which will enable them to prohibit back to back houses and cellar dwellings; to insist that all houses shall be connected with the new drainage. They could appoint a medical officer.
**SOURCE J:** From the Report of the Board of Health, 1854.

We are aware that, in carrying out our duties... we have unavoidably interfered with powerful interests, which have the means of making themselves heard by members of Government and by Parliament. We have been under the necessity of stating facts with relation to the weakness of earlier efforts.

The scheme we proposed for burials outside cities threatened... cemetery companies and the entire body of undertakers.

The report in condemning the present... supply of water to London, necessarily attracted the hostility of the existing water companies.

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**SOURCE K:** An eye witness account by James Smith of a council meeting in Leeds in 1844. The council was debating plans for a new sewerage system for the city.

I listened to the debate for nearly six hours. The chief argument of the speakers against the plan was saving the ratepayers money. They were not thinking of the sanitary results. They decided to consider a plan designed by their own surveyor. This plan would save money but the main sewers would empty their contents into the river at several points and so continue the pollution.

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In the treatment of sewerage the Victorians were pioneers, they had to learn by trial and error. The scope for error was enormous. In 1844 Leeds first considered sewering the town. It was nervous about the effects of diverting water from factories, the possibilities of sewers seeping nto cellar dwellings etc.

There were disagreements about whether to use the river as an outlet for the drains. The local newspaper, *The Leeds Intelligencer* accused the Corporation of being guilty of a most criminal delay, but one can sympathise with any town council which took a good long look before leaping into sanitary engineering.
Assignment One: Assessment Objective 1

1. Describe the conditions that encouraged the spread of diseases such as cholera in the first half of the nineteenth century. (15)

2. Why was there so much opposition to improving public health conditions in towns during this period? (15)

3. How effective were measures taken to improve public health in towns before 1870? (20)

(Total: 50 marks)
Assignment Two: Objective 2 and 3

1. Study Source A.

What can you learn from Source A about sanitary conditions in Newcastle in 1845? (6)

2. Study Sources A, B, C and D.

Do Sources B, C and D support the evidence of Source A? Explain your answer by reference to the sources. (8)

3. Study Sources E, F and G and use your own knowledge.

Use Sources E, F and G and your own knowledge to explain why cholera was such a dreaded disease in the first half of the nineteenth century. (12)

4. Study Sources J, K and L.

How useful are these Sources in helping you understand why there was so much opposition to public health reform? (10)

5. Study all the Sources and use your own knowledge.

“Public health measures and Acts were largely ineffective before 1870 in tackling the real problems of public health.” Use the sources, and your own knowledge, to explain whether you agree with this view. (14)

(Total: 50 marks)
Coursework Assignment Mark Scheme

Cholera and Public Health

Assignment One: Objective 1

1. *Describe the conditions that encouraged the spread of diseases such as cholera in the first half of the nineteenth century.*

**Target:** Key Features, causation/recall of knowledge. (AO1)

**Level 1:** Simple statement offering some details of why diseases were common in the first half of the nineteenth century, e.g. poor housing and sanitation.

(1-5)

**Level 2:** Developed statements giving details supported by relevant knowledge e.g. can give details of poor sanitation as well as other factors such as ignorance of the causes of disease or lack of effective government action.

(6-10)

**Level 3:** Developed explanation supported by appropriately selected knowledge: which can explain the reasons why diseases were so common e.g. can give a range of different reasons and can explain how they are interconnected.

(11-15)

2. *Why was there so much opposition to improving public health conditions in towns during this period?*

**Target:** Causation/ recall of knowledge (AO1)

**Level 1:** Simple statements giving reasons for opposition supported by some knowledge, e.g. opposition to paying higher taxes or opposition to be told what to do - a loss of individual freedom.

(1-5)

**Level 2:** Developed statements giving reasons supported by relevant knowledge, e.g. the strength of vested interests that profited from keeping things as they were or can explain the use of laissez-faire ideas.

(6-10)

**Level 3:** Developed explanation supported by appropriately selected knowledge showing understanding of the main factors at work with effective use of knowledge in support, e.g. groups such as the “Muckabites” and the groups that opposed the work of Chadwick etc.

(11-15)
3. How effective were measures taken to improve public health in towns before 1870? (20)

**Target:** Consequence/key features/recall of knowledge (AO1)

**Level 1:** Simple statements giving details of some of the changes that were introduced supported by some knowledge, e.g. the 1848 Public Health Act and the setting up of local Boards of Health. (1-5)

**Level 2:** Developed statements giving some evaluation of effectiveness supported by relevant knowledge e.g. the voluntary nature of much early legislation and the fact that many areas chose to ignore it or examples of improvement over the period. (6-10)

**Level 3:** Developed explanation supported by appropriately selected knowledge of relative success of measures taken, e.g. can give areas of success as well as limitations such as the opposition to Chadwick and his methods. (11-15)

**Level 4:** Sustained argument supported by precisely selected knowledge showing clear understanding of the nature and degree of success and can make effective and balanced judgements well supported by knowledge and examples. (16-20)
Mark Scheme

Cholera and Public Health

Assignment Two: Assessment Objectives 2 and 3

1. What can you learn from Source A about sanitary conditions in Newcastle in 1845?  

   Target: Comprehension of, and inference from, a source (AO2)

   Level 1: Information taken from source at face value, e.g. sanitation was bad, not enough toilets. (1-3)

   Level 2: Developed statements using inferences from the Source, e.g. can indicate how waste was kept for profit and seeped into houses when it rained. (4-6)

2. Do Sources B, C and D support the evidence of Source A? Explain your answer by reference to the sources.

   Target: Analysis and cross referencing of sources to make a judgement (AO2)

   Level 1: Simple statements supported by some knowledge using sources to support judgement, e.g. all talk of filth and heaps of rubbish. (1-3)

   Level 2: Developed statement supported by relevant knowledge from the sources in support of argument using all four e.g. as above but can make more effective use of examples from the sources. Bad drains in B, piles of waste in C and piled waste in D. (4-6)

   Level 3: Developed explanation giving a judgement making confident use of all four sources and selected knowledge, e.g. can possibly comment on the areas that are not supported or difficulty in making effective inferences from sources in different parts of the country or different periods. (7-8)
3. *Study Sources E, F and G and use your own knowledge. Use Sources E, F and G and your own knowledge to explain why cholera was such a dreaded diseases in the first half of the nineteenth century.*

**Target:** Analysis and explanation of Sources in context (AO2)

**Level 1:** Simple statements offering points in support using the sources or own knowledge, e.g. large number of people that died and horrible symptoms.

**Level 2:** Developed statements giving reasons that would explain why people were afraid, supported from sources and own selected knowledge, e.g. the speed with which it spread, the lack of effective measures to stop it and no known cure.

**Level 3:** Developed explanation giving a balanced judgement of reasons making confident use of the sources and supported by appropriately selected knowledge, e.g. shows understanding of a range of factors from the disease itself to lack of knowledge, panic and the inability of the medical establishment to do anything about it.

**Level 4:** Sustained argument using the sources as evidence supported by precisely selected knowledge e.g. understands the complexity of the factors involved from ignorance to the fact it hit rich and poor alike.
4. **Study Sources J, K and L. How useful are Sources J, K and L in helping you understand why there was so much opposition to public health reform?**

**Target:** Analysis of utility and interpretation of sources (AO2).

**Level 1:** Simple statements offering points in support using the sources at face value as information e.g. some had a vested interest in doing nothing and people did not want to pay for improvements.

**Level 2:** Developed statements giving reasons supported from sources and own knowledge. Can point out the weakness of the source or set the source in context, e.g. ratepayers did not want to pay and local and national government did not see it as any of their business. Reveals extent of problem and measures needed to improve things from reliable Public Reports of the period, sources we can trust.

**Level 3:** Developed analysis of utility making positive use of the nature, origin and purpose of the sources e.g. the value of personal accounts, the official reports and the balanced view of a later historian but will relate answer to what was needed to improve standards of public health.

5. **Study all the sources. ‘Public health measures and Acts were largely ineffective before 1870 in tackling the real problems of public health.’ Use the sources, and your own knowledge, to explain whether you agree with this view.**

**Target:** Evaluation of interpretations/recall of knowledge (AO3)

**Level 1:** Simple statement offering points in support of choice, using sources or own knowledge, e.g. yes - because people often ignored them or no - real improvements were made with some limited use of examples in support.

**Level 2:** Developed statements offering points in support of judgement, using sources and supported by relevant knowledge, e.g. yes, because of the vested interests little was done before 1870 and often ignored afterwards or can point to the work of pioneers such as Chadwick in support of no.

**Level 3:** Developed explanation giving a judgement about the view making confident use of the sources and supported by appropriately selected knowledge, e.g. J, K and L all give details of real improvements that were made and earlier
problems were in the process of being dealt with and some awareness of other areas where success was less marked.  

**Level 4:** Sustained argument giving a reasoned choice using sources as evidence and supported by precisely selected knowledge which critically evaluates the accuracy of the view and can compare it with others e.g. examines the extent of reform and its limitations with precisely selected use of sources and own knowledge.  

(7-11) (12-14)
AN INSTRUCTIONAL SCAFFOLDING APPROACH TO TEACHING SOFTWARE DESIGN

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ABSTRACT

Students often find introductory computer science courses boring and mechanical, leading many to drop from the major. Educators have suggested that bringing realistic design problems into the introductory courses would increase student retention and better prepare students for the major. However, the design and implementation of a solution to a realistic problem is often nontrivial and can therefore be very stressful to students. By using the pedagogical paradigm of scaffolding, this anxiety can be ameliorated. A prototypical design course is described where students implement solutions to progressively more difficult design problems. The solutions to these initial assignments are then continually refactored and used as the code-base for subsequent assignments and the culminating team project. The social interactions necessary for instructional scaffolding are facilitated by having each final project be unique, but similar enough to allow students to help each other. We describe the framework of assignments used in our course, including the capstone projects in which students develop computer vision-based systems that do things like read dice and poker hands, and sort M&Ms.

INTRODUCTION

Software design can be taught at different levels of abstraction, with the lowest levels usually taught in the introductory courses. Low level concepts include language-dependent idioms and object oriented, functional and procedural design patterns such as the design of functions and classes, encapsulation, and abstract data types (Astrachan, Mitchener et al. 1998; Lewis, Rosson et al. 2004). Larger and more interesting architectural design issues are usually postponed until capstone courses. In typical introductory design courses, “Students get consumed with trying to master the mechanics of programs” (Denning 2004a). As a result, many do not see the relevance of computer science and over 35% drop from the major (Denning 2004b). Flight from the major can be reduced if introductory courses engage students in motivated inquiry and experimentation, through the design and implementation of solutions to nontrivial problems (Martin 1992; McConnell, Venable et al. 1995; Braught, Miller et al. 2004).
Because real-world design problems often have no obvious or unique solution, there is risk involved in finding the best solution (Coppit and Haddox-Schatz 2005). An effective designer must learn to engage in constructive dialog to craft these solutions (Colwell 2005). Without supportive social interactions, this risk may become unmanageable for students and can lead to indecision and procrastination when students can no longer see an obvious path to a successful solution. Our approach is to incorporate the pedagogical framework of instructional scaffolding, which builds in-part on the techniques of cooperative and constructivist learning and authentic assessment.

Instructional scaffolding (Pea 2004; Wyeth and Venz 2004) refers to temporary support structures that teachers provide to help students reach new understandings they could not reach on their own. These supports may be social or cognitive: Properly managed group assignments are one example of social scaffolding, while tiered assignments that build up students’ understanding incrementally are an example of cognitive scaffolding. Instructional scaffolding is an application of Vygotsky’s zone of proximal development (ZPD), which describes the region between the student’s individual problem solving ability and the level that individual can reach in collaboration with more capable peers. Vygotsky’s social constructivism suggests that learning can be facilitated by a temporary support structure that is retained until the student can achieve results independently (Vygotsky 1978; Allal and Ducrey 2000). Vygotsky believed that social interaction is necessary for effective learning, and that learning happens best when the new concept to be learned is just beyond the student’s current reach (Vygotsky 1978). We have extended these principles to the teaching of software development using the Extreme Programming (XP) paradigm.

Cooperative learning is essential to our course. Students should work in teams throughout the course, but substantial care should be taken to promote intra-group and inter-group cooperation and to minimize competition while still guaranteeing some level of individual accountability (Johnson, Johnson et al. 1991). Students in our course begin with small one week assignments in which they are exposed to important design and architectural patterns and build tools that are used in later assignments. As the students become more facile, they work on larger assignments in pairs. In the last half of the course, teams of three students are each assigned a difficult and unique project that is demonstrated publicly on the last day of the course. The projects are deliberately larger and more complex than one student can do independently, to encourage collaboration. The projects are unique so that groups face no direct competition, but are based on a common technological theme, such as image processing, robotics, or computer networking, so that each project requires many of the same skills to complete. Students are therefore motivated to collaborate with their classmates, but still have the satisfaction of completing a project no other team will be working on. An example of a suite of projects that share many of the same technologies are: the design of a robotic system to sort M&M’s by color, shown in Figure 1; a backgammon board analyzer, shown in Figure 2, and a robotic arm that can be guide through a maze, shown in Figure 3.

These projects are an example of an authentic assessment task (Wiggins 1990). Authentic assessment allows students to demonstrate learning through application of new abilities to a “real-world” situation. Student performance on these real world tasks is not graded in the traditional sense. Instead, students are assessed on their ability to work cooperatively with other students, discuss their project, engage in active enquiry, and publicly demonstrate their work.
PROTOTYPICAL COURSE DESCRIPTION

We now present an overview of the introductory design course that has been successfully integrated into the curriculum at both Dartmouth College and SUNY Plattsburgh, and will conclude with an overview of the assignments and projects used for a version of the course based on image processing.

Our course has three major components: classroom activities, short one week assignments, and a final project spanning the last half of the semester.

Classroom Activities

Class time is spent discussing basic engineering design principles. Instead of presenting prepared material about the assignments, the course instructor encourages the students to initiate all discussion themselves, so that they will begin to ask questions and engage in the social interactions needed for instructional scaffolding and cooperative learning. The volume of material covered is restricted to ensure that students will have enough time for their assignments.

Around the middle of the semester, when students begin working on their final group project, formal class meetings are suspended and the class time is used instead for meetings between the instructor and individual project teams (Adams 1993). Consistent with Extreme Programming principles, teams are required to give demonstrations, and engage in dialog with the instructor about requirements, to ensure that their work is being incrementally developed and continuously integrated. The instructor acts in the role of a customer, in supplying the students with the feedback they need to make design decisions; and, at the same time, the instructor acts as a manager, in helping to keep the scope of the project reasonable, and to help students avoid dead ends.

Initial Assignments

At the start of the semester students are given short assignments, typically one week in duration, to help them develop software tools, skills, and design paradigms that they can use for their final projects. These assignments have limited scope but are difficult enough that they cannot be completed the night before they are due, so that students learn to leave time to ask questions and explore. These early assignments generally require fewer lines of code per week to be written than the final project, but they require that the students to take substantial amount of time to independently research the necessary algorithms and tools need to complete the assignment. The skills they learn, and the confidence they build completing these initial short assignments help tremendously to alleviate the stress of the final project when they most also work with teammates and give a public demonstration.

In the initial assignments, students modify code that is given to them. They are encouraged to search the web for code or documentation that might help them, so they learn to read code and disassemble programs to find useful pieces and to analyze the design patterns of these programs (Fridley, Jorgensen et al. 1997; Smith 1998). These
assignments are structured so there are multiple solutions, allowing students to experiment with the performance tradeoffs between different designs. As the course progresses, students should be learning to design better and more efficient code by constantly refactoring their code from previous assignments (Adams and Atman 1999). After the initial two or three assignments, students begin working in pairs on assignments, with the pairing changing each week (Srikanth, Williams et al. 2004). This helps the students get to know each other better, and allows them to compare their solutions from previous assignments to find the best starting code-base for the new assignment.

It is imperative for students to use a version control system in their work. Authentic assessment of students is also facilitated with use of a version control system such as CVS\(^1\) or Subversion\(^2\) and is also consistent with Extreme Programming paradigm:

“Version control is as fundamental to programming as accurate notes about lab procedures are to experimental science. It’s what lets you say ‘This is how I produced these results,’ rather than, ‘Um, I think we were using the new algorithm for that graph — I mean, the old new algorithm, not the new new algorithm.’”

(Wilson 2006)

A version control system fosters team ownership and frequent integration of the code. The instructor must convince students of the value of frequent integration by requiring submission of assignments through CVS, requiring multiple versions of the assignments to be tagged, checking that all team members are committing code, and—during longer assignments—checking periodically that the team’s code can be built and run correctly.

**Team Projects**

The success of a design course depends strongly on the selection of good projects and good teams. The capstone project, like any authentic assessment, should have certain characteristics. It should:

- Be engaging and meaningful, and match the content and outcomes of instruction
- Have real-life applicability
- Allows for multi-staged demonstrations of knowing, knowing why, and knowing how
- Emphasize product and process, conveying that both development and achievement is important (Kerka 1995)

The instructor should avoid having a predetermined design in mind for each project. To foster the kind of interaction and discussion that is most conducive to instructional scaffolding, the instructor should maintain the role of a coach, rather than of an authority. This role is perhaps easiest to play if the instructor has not solved the exact design problem before (Papert 1980; Jonassen 1998).

**Team Selection**

Research has shown that both team size and team diversity is critical for the success of student projects (Heller and Hollabaugh 1992). We prefer to select diverse

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\(^1\) [http://www.nongnu.org/cvs/](http://www.nongnu.org/cvs/)

\(^2\) [http://subversion.tigris.org/](http://subversion.tigris.org/)
teams of three students based on information from student surveys, performance in the initial assignments, and the instructor’s subjective assessment of personalities. We used the surveys to determine students’ schedules, estimate their tendency to procrastinate, and collect their preferences concerning the available projects and team roles. The three team members should have diverse ability levels and should be selected to prevent common problems. For instance, a meek student should not be teamed with two over-bearing students, nor should two procrastinators be put together with a student that likes to start early. The guidelines for group formation in this class closely mirror those that have been used successfully in large enrollment university physics courses.3

Project Selection

Each three person team has a different final project that builds on the tools and techniques learned during the first half of the course. The initial project request is open ended and the form of the final demonstration is continuously negotiated, giving the students a sense of ownership of the project. Projects must be more complex than one student could do alone and have a logical portioning that allows each team member to be responsible for a separate project component. An example of such a project is the automatic recognition of a backgammon game shown in Figure 2. One student can be responsible for locating the board in the image, another the individual pieces, while a third provides a unified user interface with speech output.

Projects should be selected to build on the initial assignments, actively engage the students and create an interesting public demonstration. A public demonstration of the project helps connect the course material to the students’ lives outside the classroom—they can invite their friends to see the fruits of their labor, and use their demonstration during a job interview. The projects should interact with the real world and use non-deterministic data as input to promote experimentation and inquiry while requiring students to design and write robust code that is thoroughly tested.

The various projects should be sufficiently different as to foster class creativity and allow each group to “boldly go where no man has gone before.” At the same time, they should not be so vastly different that their cohorts cannot understand their project and provide support. Collaboration between groups and esprit de corps is fostered because there is no direct competition between groups, and when all the projects are different, teams have no incentive to procrastinate; weaker students and teams cannot afford to wait around for others to lead. Assessment is also made easier with different projects for each team (Daly and Waldron 2004)

Overall evaluation of the project should be based primarily on the quality of the complete work, rather than on the quality or quantity of the underlying code. As with

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3 http://groups.physics.umn.edu/physeed/Research/CGPS/FAQeps.html
any software code base, subsequent refactoring will generally be necessary before the code will become of publishable quality. Therefore the main focus of team meetings should be on what is needed for a robust, coherent and demonstrable project, rather than on minor details of code quality.

**EXAMPLE SYLLABUS**

The following is a representative syllabus for our course on design principles, based on the version of the course taught during the Spring of 2005 at Dartmouth College.

This is the third course in an introductory sequence. The first course is a standard Java-based programming course. The second course provides the students with a grounding in important basic data structures and the functional programming paradigm, using the Scheme programming language. In addition to teaching software design principles, the course described in this article also provided the students with their first exposure to the Linux environment and the C programming language. Therefore, our initial assignments were chosen to bring students up to speed writing increasingly complex programs in a combination of C and Java, as well as learning how to use important Linux development tools. As additional scaffolding, the students (most of whom had previous background in Java) were allowed to code parts of their solutions in Java, thus taking advantage of their existing knowledge. We also provided them with a number of related example programs they could read and modify.

During 2004 and 2005 the assignments and projects in this course were based on processing and understanding of images captured from inexpensive USB web cameras. This domain allows students to easily interact with the real world and automate simple tasks such as reading dice, counting change, understanding poker hands, observing board games such as Checkers and Backgammon, and controlling computer games with head or hand motion.

**Course Meetings and Readings**

Readings were assigned before each class meeting. Each class meeting began with a short reading quiz, to provide starting points for discussion and to motivate students to complete the reading before class. The students did not study any formalized process for software development; however, we did discuss its necessity in some domains. Many of the readings were taken from Joel Spolsky’s website Joel on

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4 Details can be found at http://alum.mit.edu/www/spl/Academic/Design
Software. Joel writes in an accessible style that demystifies the software industry, writing specifications, software design and marketing, and that raises interesting questions for discussion.

The reading quizzes were supplemented by skill check-off sheets that required the students to demonstrate to a Teaching Assistant (TA) their basic mastery of various development tools, such as the Eclipse IDE, the GNU debugger, etc. The check-off sheets forced each student to make time to see a TA and helped open up dialog between the students and the TAs, without the stress of a formal examination. They also served as helpful diagnostics for the instructor as to how the students were progressing in their knowledge of important tools and skills.

Programming Assignments

We gave five assignments designed to help students learn important techniques such as interprocess communication between Java and C programs using sockets, and basic image manipulation tasks. These projects are summarized in Table 1.

The first assignment required students to send one-dimensional arrays of numbers across a socket from a Java program to a C program for sorting. The second assignment builds upon the first by having them send images (two-dimensional arrays of numbers) across a socket to a C program for histogram equalization.

Starting with the third assignment, students were assigned to work in pairs. Students who had trouble with the first two assignments now get a chance to work with another student and see how they manipulated images. This assignment instructs students to read PNG images from files on disk and manipulate them in various ways, which requires them to do research into how to use libpng, an open-source library for manipulating PNG images. The assignment is partitioned into two parts so that each student could be held accountable for an individual contribution.

For the fourth assignment, the students were given new pairings and instructed to read PNG files and detect filled red circles in the images. There are many ways to do this, some more efficient than others. While their initial attempts may not have been efficient, they would later have the opportunity to refactor this code for use in their final team project.

For the fifth assignment, the students were assigned to the teams selected for the final project. This allowed the students to make a more gradual transition into the longer open-ended final project with their team. This assignment required teams to acquire video from a web camera and to find and locate a red ball or similar object in (more or less) real time.

Projects

Students were given a list of team projects to select from and were encouraged at the beginning of the term to submit their own project ideas. The list of projects is changed each semester, so students felt that that they were doing something new, but some themes did recur. Table 2 gives a listing of the five projects completed in the spring of 2005. Three of the five projects used hobbyist servomotors to control small robotic arms. This was done to give students who were also engineering majors a chance to work on a project that used a closed-loop servo system.

Each week, each team scheduled and attended a one-hour “walkthrough” with the course instructor to demonstrate progress and to review documentation and code.

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5 http://www.joelonsoftware.com
6 http://www.libpng.org/pub/png/libpng.html
instructor used CVS to monitor the contributions of each team member to the code base. Other impromptu meetings were often held in the lab when the instructor saw students working.

**Grading**

Each student’s final grade was based upon their performance on the reading quizzes, the initial assignments and the team project. On the assignments completed in pairs, both students usually received the same grade, especially if they cooperated well. Because the pairing changed weekly, weaker students could not hide behind a single strong partner for the entire course.

Project grades were based on weekly presentations and discussions with the team, review of the code and documentation archived in CVS, and the public demonstration at the end of the course. The public demonstration was advertised department-wide. Each team made a presentation and demonstrated their working project. The evaluation of the presentation was determined by the scope and difficulty of their project, and whether (and how well) it worked. While students were made aware of the general expectations for the project, and received regular feedback concerning their progress during the term, there was no formal grading rubric for the final project. The grades awarded were uniformly high, given the high level of accomplishment of all students who completed a working project.

Guidelines concerning academic integrity are especially relevant to this course, since students are actively discouraged from writing all the code for their projects from scratch. It is important for the instructor to communicate when code reuse is appropriate (i.e., code from publicly available sources used with proper citation) and inappropriate (i.e., code from current or former students of the college, code written by someone hired by the student, or code used without proper citation). We found that public availability is a good informal metric for whether or not reuse is appropriate, in most cases.

**COURSE EVALUATION**

The most convincing evidence of the course’s success is the public demonstration of the final projects. In the past four semesters during which this course has been offered, every team has demonstrated a working product to peers and non-course faculty members. The list in Table 2 attests to the complexity of the projects undertaken by the enrolled students, most of whom are freshmen and sophomores for whom this is only their third course in computer science.

<table>
<thead>
<tr>
<th>Using Sockets</th>
<th>Send integers over a socket from a Java program to a C-program for sorting, and then back for display on the Java side.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Histogram Equalization</td>
<td>Use a socket to transfer images between a Java and C-program. Convert a Java method that performs histogram equalization to C. Compare results.</td>
</tr>
<tr>
<td>Manipulate PNG images</td>
<td>Read, manipulate and save PNG-images using libpng.</td>
</tr>
<tr>
<td>Find circles</td>
<td>Find circles in synthetic images and photographs.</td>
</tr>
<tr>
<td>Acquire video</td>
<td>Acquire video and find circles in live images</td>
</tr>
</tbody>
</table>

Table 1. A list of assignments given during the Spring 2005 semester. The first two assignments were done individually, the second two in random pairs, and the last one done with the student’s team for the final project.
Although the breadth of content has been reduced as compared to a more traditional software design and implementation course, the instructors of upper division courses have not complained of any adverse effect on the students’ programming ability. Indeed, the instructors of the upper division project courses have reported that students are more confident and skillful since the introductory course moved to a project format that included instructional scaffolding, and the students themselves have reported feeling “much more confident” in their programming and problem-solving abilities. The following quotations are from end-of-term evaluation questionnaires given to students in the Spring 2004 offering of the course:

“It has a wonderful new direction and is highly recommended to take. More courses like this one should be offered.”

“I learned a lot! Not just specific techniques, but how to independently approach and eventually solve problems I had no clue how to even think about in the beginning.”

 “[There was] always something challenging to work on, and a sense of accomplishment when finished.”

These responses point toward an encouraging level of student enthusiasm.

**DISCUSSION**

Our design course based on the pedagogy of instructional scaffolding is an effective segue between the highly-constrained assignments often encountered in introductory courses and the more difficult open-ended projects students will see in upper division courses and in the workplace. In our eight years of teaching design, we have found that starting the semester with small individual assignments that build upon each other is much more effective than a single semester long team project. Weaker students build skills early on, and are better positioned to contribute to their team when the projects start. Everyone is held accountable in this approach. Having a different project for each team performs a similar function: Weak individuals and groups can no longer hide behind stronger classmates, while stronger students can veer off on tangents interesting to them without having their results intimidate the rest of the students.

We have also found that the iterative and adaptive techniques of software development in the Extreme Programming paradigm are well suited to an introductory design course. When we first began teaching design in the mid-1990’s students followed a waterfall model of software development—they produced long requirement and specification documents at the beginning of the semester and only began coding at

### Table 2. A list of projects done by students during the Spring 2005 semester.

<table>
<thead>
<tr>
<th>Project</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sorting Marbles</td>
<td>Sorted marbles using a two degree of freedom robot arm.</td>
</tr>
<tr>
<td>SpongeBob</td>
<td>Automatically mimic your shuffling of colored sponges using a five degree of freedom robot arm.</td>
</tr>
<tr>
<td>Maze Mapping</td>
<td>A robotic arm is guided through a maze using a visual servo loop. Then the arm is quickly returned to the start using the memorized path.</td>
</tr>
<tr>
<td>Poker Face</td>
<td>Read a poker hand that is laid on the table in any orientation.</td>
</tr>
<tr>
<td>Gesture control of video game</td>
<td>Using hand gestures control a car in a multi-player race simulation.</td>
</tr>
</tbody>
</table>
the end of the semester. Usually this approach is only effective if the designer had already solved a similar design problem. Our experience supports this view, and after experimenting with a number of agile development methodologies, we finally settled upon Extreme Programming as the most productive paradigm for the students, as well as the most compatible with our application of instructional scaffolding to the teaching of software design and implementation.

Versions of the course described in the Example Syllabus above have been taught at multiple schools (SUNY Plattsburgh and Dartmouth College), and by multiple instructors, which suggests that its results are transferable between institutions and instructors. It has been our observation, however, that for this approach to teaching software design to be effective requires a strong level of commitment on the part of the instructor, and a “leap of faith” that it will work. The instructor must be aware that the benefits of this approach are diminished if the students are led too strongly toward particular solutions and it if the instructor is lured into lecturing, rather than coaching. While more traditional lecture-format courses in software design can be effective, an open-ended cooperative learning framework more effectively promotes learning and the positive benefits of instructional scaffolding and authentic assessment.

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Balancing Scaffolding and Complexity in Open Ended Group Projects (OEGPs)

Mats Daniels ¹ and Amie Hauer ²

Abstract - There is a gap between the problems our students typically encounter in their education and the problems they are likely to be asked to solve in their future employments. Real-world problems are often ill-structured (open ended) and we argue that working on well-structured problems, as is common in educational settings of today, does not fully prepare students for the problems they will encounter in their professional life. This paper will focus on the use of Open Ended Group projects as an educational setting and address why it can be useful in reaching general goals of engineering education and how scaffolding can balance the inherent complexity of such educational settings.

Index Terms – Open ended problems, Ill-structured problem solving, Professional skills, Real-world problems, Theories of learning, Situated cognition.

INTRODUCTION

Problem solving is considered a fundamental learning activity [1, 2] and is often considered a component of higher order thinking skills. Problem solving requires the solver to be able to recognize problem pieces and gaps, as well to formulate a decision and provide reasoning. As educators, one of our goals is to strive for higher-order critical thinking skills in our students. In educational programmes, the desire for critical thinking skills frequently surfaces in education study programmes. For computing education, the ACM/IEEE Computing Curricula 2001 [3] is a useful guideline whose goals align well with using Open Ended Group Projects (OEGP) [4] in engineering education.

In an OEGP environment, learning is seen as a social process in which open ended problems are given focus. An OEGP learning environment can be implemented using pedagogical ideas such as Situated Cognition [5], Practice fields [6], and Communities of Practice [6, 7]. In this setting, the situatedness of the learner, the learning environment, and the problem in context is seen as instrumental to successful learning.

Open ended problems are often "ill-structured", i.e. where goals or bounds are unspecified, unclear or insufficient in various ways and are considered to be more complex, more open ended, and also more real-world or indeterminate in their end goals in comparison to “well-structured” problems [1, 8, 9, 10, 11, 12]. Also, ill-structured problems have no clear or distinct solution, but rather have an array of various solutions that may be used to resolve the problem, just as would happen in professional settings later.

COMPLEXITY CONCERNS

An important aspect regarding open ended (ill-structured) problems is knowledge of human cognition. Learning how to solve open ended problems may be considered a skill just as important as reaching a solution. This is crucial because it appears that novices have a choice of either focusing on goal attainment (solving the problem) or learning how to solve the problem (schema acquisition) [1]. The competition between these competing goals (bearing in mind that novices must spend more time in information-search because their domain knowledge is less) sometimes induces learners to solve the problem at the expense of acquiring schemas that they may then apply to future problems [11]. Some recent work on problem representation focuses on problem recognition (deep vs. surface) and problem transfer [1]. Learning how to resolve ill-structured problems is important for critical thinking skills and part of the OEGP process.

Even so, there are some critics of environments using open-ended problems as a way to teach how to resolve open-ended problems. One criticism is the use of minimal guidance methods in letting students be responsible for their own learning, e.g. Kirchner et.al. [13]. The core of this argument is that a deep and thorough understanding of something is essential in order to use the knowledge, and that the minimal guidance approach is ineffective for transferring knowledge into long-term memory. This critique is useful and need not be discarded, but rather can be used as inspiration for setting up a learning environment that takes into account scaffolding and knowledge of human learning.

Preexisting knowledge and skills are an important component of being able to resolve open ended problems successfully. This can be supplemented by research on expert and novice differences [14] as well as statements in Kirschner et.al. [13] indicating that scaffolding is most useful when aligned with the students skill/ability level. We argue that balanced scaffolding can be a strategy to address differing skill levels and still achieve higher order thinking skills through using ill-structured problems. Successful scaffolding in OEGP is built from careful case selection, an understanding of knowledge prerequisites for the course, and the ability to draw upon students’ previous learning experiences.

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Essentially, scaffolding should be at the “right” level, i.e. not so strong as to lead to an over-challenging setting nor too weak as to be no real help at all. Here we offer that Vygostsky’s zone of proximal development [15] can serve as an argument for using scaffolding at the “right” level. Also, adequate time is another factor that needs to be addressed in setting up an OEGP environment, since there needs to be enough time to get an understanding of the problem, enough to work on the problem resolution, and adequate time to reflect on the problem and solution. We find the time for reflection and discourse an important part of the environment for situated learning in these courses using OEGP.

SOLUTION: USING SCAFFOLDING TO BALANCE THE LEARNING ENVIRONMENT

Open ended problems are complex. The challenge of complexity can be addressed by realizing that complexity is not a binary situation. Complexity can be managed. OEGPs can be combined with scaffolding to provide students with support (e.g. about facts or procedures) to manage the complexity as they learn. The issue of high cognitive load [11, 16] in student-centered learning environments such as OEGPs is also a concern, and there might be a need to use externalized support or scaffolding to help students manage their cognitive and metacognitive processes [12, 17]. Cognitive load is somewhat related to the skill level of the problem solver, i.e. whether novice or expert [11, 12, 18], which gets back to scaffolding. Providing well-balanced scaffolding supports the learning theories behind an OEGP setting, and prepares students for resolving open ended problems.

This said, it is vital to understand the underlying pedagogical reasons for using an OEGP, or any other method for that matter, when looking into what scaffolding really means to a course. An OEGP might be based on communities of practice ideals, for example, and then the scaffolding should be focused on issues that engage students in participating in the community. OEGPs often use experts, in the form of clients or industry personnel or prior students, to be assistance to the learners in resolving the end result, which builds on the ideas of a community of practice. Finally, scaffolding should ideally be a result of students reaching the conclusion that they need some information, and the instructor or a member of the community facilitating students’ learning, e.g. facts about something or procedures used in some situation. Less ideally, but at times necessary, is the need for the instructor to help students overcome excessive information search and re-focus on the issue at hand, in order to avoid a stand-still.

CONCLUSIONS

Open Ended Group Projects (OEGP) is one way to build towards many, if not most, of the more general goals of engineering education, e.g. the ability to critically evaluate information, effective oral and written communication skills, project management skills, and an understanding of ethical issues, to mention a few. OEGP focuses on giving students practice in managing open ended problems by working on an open ended problem. This works suggests that designers of OEGP settings should consider issues of complexity, and design learning experiences using measures to keep the learner at the point of challenge without overwhelming them. This result may be achieved through appropriate scaffolding as one way to address the issue of complexity in OEGPs.

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37th ASEE/IEEE Frontiers in Education Conference
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55
How to Design Assignment Scaffolding
Scaffolding Formal Assignments

What is Scaffolding?

Just as a construction worker on the outside of a building climbs the scaffolding one floor at a time, students need to climb intellectual scaffolds one at a time. Often the best assignments challenge students to move from one cognitively difficult phase to the next, more challenging phase, as illustrated in the steps along Bloom’s Taxonomy below, and Perry's Model of Intellectual Development. The success of assignments often depends on how well suited and how responsive they are to the content and requirements of the course as well as the ability levels of the students.

Bloom's Taxonomy

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Comprehension</th>
<th>Application</th>
<th>Analysis</th>
<th>Synthesis</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeat, list, name, cite, relate, tell, define, etc.</td>
<td>Translate, report, describe, retell, explain, discuss, summarize, recognize, etc.</td>
<td>apply, show, solve, simulate, operate, experiment, calculate, etc.</td>
<td>interpret, test, examine, differentiate, distinguish, investigate, etc.</td>
<td>Predict, plan, hypothesize, incorporate, invent, propose, formulate, etc.</td>
<td>Judge, assess, revise, measure, recommend, criticize, evaluate, determine, etc.</td>
</tr>
</tbody>
</table>

Perry’s Model of Intellectual Development

This is a simplified version of William Perry’s nine-stage model of intellectual and ethical development. He studied the development of students during their undergraduate careers. Perry called it a progression from "thinking to metathinking," under scoring the importance of reflection and the ability to meaningfully critique one’s own ideas.
An understanding of Perry’s phases would be particularly useful for those who have students investigate open-ended dilemmas within their professions. For more on Perry, see William G. Perry, *Forms of Intellectual and Ethical Development in the College Years: A Scheme*. New York: Holt, Rinehart, and Winston, 1970.

*Why scaffold assignments?*

- Breaks up the cognitive task into smaller, more manageable tasks
- Allows for more intervention when it’s useful
- Fosters global revision—revision in one’s understanding of the subject matter
- Shows more clearly the relationship between in-class and out-of-class work

*How do you plan such a sequence?*

Work backwards from the assignment itself:

1. List the cognitive skills required to complete an assignment.
2. List what content knowledge students must understand before they can say something of their own about it or apply that knowledge to a new situation.
3. Work smaller assignments into the course that will prepare students to think in the ways the assignment requires and that reinforces the materials and content they need to complete an assignment
WHAT IS SCAFFOLDING? – It is structuring assignments and course material in a systematic way to support your learning objectives and make the goals and process transparent to students.

PART ONE – Scaffold and Assignment Design

A. PROCESS SCAFFOLDING
One effective method of scaffolding is to take a complex assignment, such as a literature review, lab report, or research essay and break it into smaller components. Providing formative feedback on the earlier assignments will help students master each step in the process before proceeding further. This type of scaffolding helps students get started on complex assignments early and ensures that they are on track throughout.

Possible steps in a complex assignment | Smaller assignments to help students master each step
--- | ---
Topic Selection | Free-writing
 | Proposal
 | Working Thesis Statement
Research | Annotated Bibliography
 | Read Map
Evaluation of Sources | Critical Review
 | Literature Review
Draft | Outline
 | First Draft
Revision | Peer Review
 | Meta-Statement

B. CRITICAL THINKING SCAFFOLDING
Another effective method is to give different types of assignments that function as scaffolding to support students as they develop their critical thinking skills. Begin with assignments that demand lower order critical thinking skills (abstracts, summaries or descriptions, quizzes) and build towards more complex assignments (case analysis, business plan, lab report). This type of scaffolding can difficult to implement in large courses because of the marking involved, but use of writing-to-learn assignments can help.
Assignments that support critical thinking goals in large classes

<table>
<thead>
<tr>
<th>Possible Objective</th>
<th>Ideas for large classes</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remember a term or definition</td>
<td>iClicker questions</td>
<td>Quick and can be used to help break up the lecture</td>
</tr>
<tr>
<td></td>
<td>self-test quiz</td>
<td></td>
</tr>
<tr>
<td>Improve comprehension of a complex concept</td>
<td>One-minute paper</td>
<td>Can be given in-class or as homework</td>
</tr>
<tr>
<td></td>
<td>Reflection paper</td>
<td>Can be unmarked or given pass/fail grades</td>
</tr>
<tr>
<td></td>
<td>Statement of confusion</td>
<td>Could be submitted simply to help you see where students are having trouble</td>
</tr>
<tr>
<td>Synthesize course concepts throughout the term</td>
<td>Learning journal</td>
<td>Does not require feedback</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Can be submitted periodically and given pass/fail grades</td>
</tr>
<tr>
<td>Develop more sophisticated research and writing</td>
<td>Peer-review of drafts</td>
<td>Helps students learn how to evaluate assignments, but the onus is on students, not the instructor or TA.</td>
</tr>
<tr>
<td>assignments</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Memory and Comprehension Checks - Quick ways to ensure students understand the basics before attempting to complete more complex assignments.

a. iClicker questions: Great for in-class mini-quizzes. The technology can be used to give grades for either participation or for getting the correct answer, but this should be done with caution as there are possibilities of technical difficulties or misuse. Also, not all students have iClickers, so they might be required to buy one for the course.

b. Self-Test quiz: A low-tech version of the above that is much harder to track and grade, but much easier to administer. Simply ask students a series of questions and have them write answers in their notes. Then go over the answers with them, so they can check their own work.

Writing-to-Learn Assignments - These are informal, easy to administer and very useful for helping students process course material.

a. Learning journal: Encourages students to reflect on their learning process throughout the term. Students write regular entries in response to clear prompts related to course material or their understanding of it. Not only does a learning journal help students learn to articulate their thoughts and questions, it helps them to see the progress they’ve made and notice patterns in the course material.

b. One-minute paper: A very short essay, usually written in-class without time for planning or revision. Key is to give students a clear question prompt and one minute to jot their answers.

c. Read Map: A concept map that helps students synthesize their research or course readings. Encourage students to draw and label the connections between their sources.

d. Reflection paper: A short writing assignment that can either be written in class or at home. Reflection papers are most useful for getting students to step back from the material to think about their own understanding of it (and strategies for moving to the next level) or patterns within it (developing a richer understanding). It is important to give students a clear prompt to help them focus.

e. Statement of confusion: A version of the one-minute paper where students are asked to write for a minute or two on the concepts or material that most confuses them. If collected, these statements can be very helpful for seeing whether and where students are getting lost.
Revision Assignments - Revising or re-thinking their writing helps students improve their critical thinking skills and course mastery. The following assignment types are effective approaches for large classes.

a. Meta-statement: Prompt students to write a paragraph reflecting on how they would improve their paper if they had the time or opportunity. This assignment can be effective whether students write it before handing in their papers or after they have received feedback.

b. Peer review: Peer review can be done in-class, outside of class, or through technology such as Blackboard or PeerScholar. Students will need to be coached on how to give effective feedback (rubrics and models are very helpful for this), and to ensure that all students participate, the exchange of papers should be organized by the instructor or TA.

PART TWO – Strategies for Successful Scaffolding

1. Define clear learning objectives. Avoid vague phrases such as “mastery of course content” and strive for precise statements of what students will be able to do, know, and value.

2. Think about what assignments you would like students to complete and how the assignments will help students meet those learning objectives. E.g. A midterm or short reflection paper might aim to make students demonstrate their ability to explain specific core concepts or solve particular types of problems.

3. Organize assignments in a way that culminates in your learning objectives. E.g. If aiming for a comprehensive research paper that shows students are capable of producing professional work appropriate to the discipline, then sequence the assignment over the course of the term. If aiming to have students demonstrate facility with course content, then use different types of assignments to gradually increase from simple memorization to the ability to evaluate and problem solve.

4. Be very clear with TAs and students about both the purpose of the assignment. This will help students transfer these skills to other courses and advance through their degree in a way that is deliberate, and not simply accidental.

5. Be very clear with students, and with TAs, about your expectations. A grading rubric communicates expectations to all involved and is a great way of keeping both students and graders on the same track.

6. Time assignments and explanations carefully so that students will be able to see the close connection between your lectures and the skills and techniques they will need to complete those assignments.

7. Be creative. There are many different ways to scaffold assignments that can help engage students and improve their learning outcomes.

Time-saving Tips

1. Take advantage of technology. Blackboard can help you manage assignments; the library feeds will help your students find the appropriate resources.

2. If students are submitting drafts, give most of your feedback early on, so students can benefit from it, and produce better assignments. Then, for final drafts, simply assign grades.

3. Give only pass/fail grades for the smaller, less consequential steps. This can be done very quickly through Blackboard and will leave time for marking the larger pieces in more depth.

4. Focus feedback on your specific learning objectives. For example, if your goal is to develop students’ skills at critical thinking and argumentation, don’t waste time correcting grammar and sentence structure but focus on content and how well the student is meeting your expectations. Rubrics can also be very useful for making grading more efficient.

5. Stagger assignments. Give students a choice of which assignments they can do, with different deadlines. This will stagger marking duties over the semester.
6. Build learning communities or peer groups. Having students give feedback to their peers throughout the process has been shown to improve student learning and transference of skills. Caution: While peer evaluation is a very effective strategy, having any of the marks dependent on that evaluation can be problematic.

### Troubleshooting Scaffolding

<table>
<thead>
<tr>
<th>Concern</th>
<th>Some responses</th>
</tr>
</thead>
</table>
| “Scaffolding takes too much time.”                                     | • Yes, it takes time in design, but it will save time and most importantly frustration when grading, particularly large final assignments.  
• Use technology—PeerScholar, iWRITE, Blackboard  
• Build learning communities in the class so peers can offer one another feedback |
| “My students don’t like a lot of small assignments. They complain it’s too much work.” | • Be explicit about process and value of working step by step towards goals; explain that it isn’t really MORE work, just organized differently  
• Students report that scaffolding reduces stress  
• Emphasize connections to course learning objectives |
| “It adds too much to my marking load. Neither I nor my TAs have time!” | • Not everything has to be marked, or marked individually: give group feedback  
• Give pass/fail grades for less consequential assignments.  
• Stagger assignments  
• Give early feedback  
• Have students review their peers papers  
• Focus feedback on learning objectives  
• Develop grading rubrics to facilitate marking |
| “I tried grading and giving feedback on early drafts and students just made the specific changes I suggested and expected better marks.” | • Give pass/fail grades for early drafts—or take off grades if students don’t submit a draft.  
• Include global recommendations for improvements as well as specific ones  
• Make clear criteria for actually getting a better mark (i.e. a revision rubric)  
• Define revision and discuss process and expectations explicitly—show examples of drafts of your own writing  
• Make final step worth the bulk of the marks |
| “I like the idea of peer review but I’m afraid that students won’t take it seriously.” | • Do it in class and introduce by discussing the professional peer review process  
• Ask student reviewers to answer specific questions on a handout (broad Qs around thesis, argument, and organization tend to be better than grammar) and give you a copy of this feedback. You can then mark the feedback—either Pass/Fail or  
• For larger classes use PeerScholar |
| “Scaffolding makes it too easy and will alienate the brighter students.” | • Scaffolding does not just break down the process, it supports learning. If every stage has a learning goal, even the brightest students can push themselves further at each stage.  
• With the structure scaffolding provides, you can make assignments much harder and more interesting, which will challenge and satisfy the best students, while still making it possible for everyone to succeed |

For more info, contact us at: Centre for Teaching and Learning • ctl.utsc.utoronto.ca • 416.287.5663
Essay Scaffold

Name: ________________________________

Essay Question:

Introduction:

Body: Each point in your introduction becomes a paragraph and must be backed up with an example. Remember TEEL (Topic Sentence, Explain, Example, Link back to the question) for every paragraph.

Point 1:

Link to Question:

Point 2:

Link to Question:
Point 3:

Counter Argument: In most essays, there needs to be a counter argument, which states points that do not agree with your point of view.

Conclusion: Show how you have answered the question and supported your argument by summarising your main points in relation to the question.

Editing Checklist:
- Did I answer the question?
- Does each paragraph relate directly to the question and have I clearly shown the connection?
- Have I used correct essay conventions?
- Have I checked that spelling, punctuation, sentence structure and expression are correct?
## Wheelock College Library Research Log

State your topic as a question:

Identify the keywords or concepts in your question:

Identify other words that may be related to your topic or that may be synonyms for your keywords listed above:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Sources Consulted</th>
<th>Search Terms Used</th>
<th>Results / Comments / To do</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Example:</strong> Teaching autistic children</td>
<td>Library Catalog</td>
<td>Autism and teach</td>
<td><em>Read Me Teach Me, 371.92 K14r - Wheelock;</em> Teach me Language, LC 4717 .F74 1997 – Emerson; request via ILL</td>
</tr>
</tbody>
</table>

|                                               |                   |                   |                                                                  |
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|                                               |                   |                   |                                                                  |
Research Paper Scaffold

Research Question
______________________________________________________________________________________
______________________________________________________________________________________
______________________________________________________________________________________

Hook
What is interesting about this question? Hook your readers with an interesting fact that might make them curious about this topic.
______________________________________________________________________________________
______________________________________________________________________________________
______________________________________________________________________________________
______________________________________________________________________________________
______________________________________________________________________________________

(continued)
Literature Review

Find five articles about your topic and list the relevant facts from each one.

1. According to (author/source) (date) the main idea about this subject is

____________________________________________________________________________________
___________________________________________________________________________________

List facts from the source that support this idea

1. fact
2. fact
3. fact
4. fact
5. fact
(You can add more facts as you find them.)

In conclusion _______________________ says ____________________________________________
_____________________________________________ about the topic.

2. Another idea, by (author/source) (date) is ________________________________

____________________________________________________________________________________
___________________________________________________________________________________

1. fact
2. fact
3. fact
4. fact
5. fact
(You can add more facts as you find them.)

In conclusion _______________________ says ____________________________________________
_____________________________________________ about the topic.

3. A third writer, __________________________ (date) states that ________________________

____________________________________________________________________________________
___________________________________________________________________________________

1. fact
2. fact
3. fact
4. fact
5. fact
(You can add more facts as you find them.)

(continued)
Literature Review (continued)

The third author concludes that __________________________________________________________
____________________________________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________

4. A fourth source, ______________________________ (date) states that __________________
____________________________________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________
1. fact __________________________________________________________________________
2. fact __________________________________________________________________________
3. fact __________________________________________________________________________
4. fact __________________________________________________________________________
5. fact __________________________________________________________________________
(You can add more facts as you find them.)
This author concludes that __________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________

5. Yet another idea, from ______________________________ (date) is that __________________
___________________________________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________
1. fact __________________________________________________________________________
2. fact __________________________________________________________________________
3. fact __________________________________________________________________________
4. fact __________________________________________________________________________
5. fact __________________________________________________________________________
(You can add more facts as you find them.)
This author concludes that __________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________
___________________________________________________________________________________
(continued)
Analysis

I found *(how many)_____ main idea/s about *(name your topic)*:  
List main idea/s ____________________________________________
______________________________________________________________________________________
______________________________________________________________________________________
______________________________________________________________________________________

Explain how the ideas are different or the same.
______________________________________________________________________________________
______________________________________________________________________________________
______________________________________________________________________________________
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______________________________________________________________________________________
______________________________________________________________________________________
Original Research

How would you test the idea you think makes the most sense?

In order to test the ideas about \((your\ topic)\) this researcher will (describe a suitable way to test your ideas: survey, experiment, model, interview, etc.)

Results: (What happened?)
List your results. You can attach a table, chart, or list of findings.
Conclusion

What is your answer to the question? (Give the facts that support your point.)

The most likely explanation seems to be that ____________________________________________
                                                                                       _____________________________
                                                                                       _____________________________
                                                                                       _____________________________
                                                                                       _____________________________
                                                                                       _____________________________
                                                                                       _____________________________

References
Author last name, first initial. (date). title of article. date retrieved (if online publication), pages (if print publication) of the references cited.
Example Research Paper Scaffold

Research Question
How does color affect one’s mood?

Hook
What is interesting about this question? Hook your readers with an interesting fact that might make them curious about this topic.
Colors seem simple, but they affect people. If someone is angry, it could be because they are surrounded by or looking at the color red! People’s moods can change depending on what colors they are looking at. One simple color can affect a person’s whole mood.
Example Research Paper Scaffold (continued)

Literature Review
Find five articles about your topic and list the relevant facts from each one.

1. According to (author/source) Johnson (date 2007) the main idea about this subject is color does affect mood by producing chemicals and stimulating feelings such as hunger ________________________________________________________________

List facts from the source that support this idea
1. fact blue- calm because it releases calming chemicals
2. fact red- can make you hungry because it’s an appetite stimulant
3. fact yellow- irritated people lose temper more in yellow rooms
4. fact pink- tranquilizing, makes one feel weak
5. fact ___________________________________________________________
(You can add more facts as you find them.)

In conclusion Johnson says depending on color, one’s body can do things like produce chemicals to make it act a certain way ____________________________________________________________ about the topic.

2. Another idea, by (author/source) Smith (date 2007) is that the effect color produces is based on what one’s body does in response to it.

1. fact yellow- mentally stimulating, activates memory
2. fact red- increases confidence
3. fact brown- makes one feel orderly and stable
4. fact dark blue- makes one feel sad
5. fact ___________________________________________________________
(You can add more facts as you find them.)

In conclusion Smith says that different colors do in fact change one’s mood and our reaction to color affects the choices we make.

3. A third writer, Wollard (date 2000) states that color can affect one’s mood, but the effect can also depend on culture and one’s personal reflection.

1. fact someone from Japan might not associate red with anger
2. fact if someone likes the color brown, they might associate it with happiness
3. fact pink reduces aggression, which is why jail cells are pink in Seattle
4. fact brown makes one feel comforted
5. fact ___________________________________________________________
(You can add more facts as you find them.)
Literature Review (continued)

The third author concludes that colors affect one’s mood, but there are other factors that can affect it too.

4. A fourth source, Eric, John, and Paraag (date 2007) states that the main point about color psychology is that color has both a physiological and psychological effect.

1. fact green—relaxes because it relaxes muscles and makes one breathe deeply and slowly
2. fact blue—lowers blood pressure, which makes one calm
3. fact __________________________
4. fact __________________________
5. fact __________________________
(You can add more facts as you find them.)

This author concludes that color affects mood because it affects one’s body.

5. Yet another idea, from Airey (date 2006) is that color is energy and it has a physical, mental, spiritual, and emotional affect on people.

1. fact black—sophisticated and secure, but also depressed
2. fact brown—reliable and serious
3. fact yellow—lifts one’s self-esteem
4. fact __________________________
5. fact __________________________
(You can add more facts as you find them.)

This author concludes that different colors have different affects on people.
I found (how many) 3 main idea/s about (name your topic) color psychology:

List main idea/s that color affects one's mood. They differ based on what factors influence the effects of color, such as culture, opinion, and what goes on inside one's body:

---

Explain how the ideas are different or the same.

One of the three ideas says color affects one’s mood based on personal opinion. For example, if one dislikes pink, it can be associated with hate. Another idea says that color affects one’s mood based on one’s own culture. An example of this is that someone from the U.S. may associate green with envy, while people in Japan think of yellow when talking about envy. However, the majority of the sources say that color affects mood by affecting what’s going on inside one’s body. Seeing blue releases calming chemicals, which makes one calm. Because yellow is the hardest color for the eye to focus on, people may become irritated when looking at yellow. Babies cry most in yellow nurseries.

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(continued)
Original Research

How would you test the idea you think makes the most sense?

In order to test the ideas about (your topic) color psychology this researcher will (describe a suitable way to test your ideas: survey, experiment, model, interview, etc.) test sixty middle school students (30 girls and 30 boys) on how the colors green, blue, black, yellow, red, pink, and brown make them feel. On the survey form provided by this researcher, students will mark the feeling that each color makes them feel.

Results: (What happened?) List your results. You can attach a table, chart, or list of findings. Most female middle school students thought that blue made them feel calm, brown bored, and yellow happy/cheery. Most male middle school students thought that blue made them feel relaxed, brown bored, and yellow/cheery. (see chart in the Example Research Paper)
Conclusion

What is your answer to the question? (Give the facts that support your point.)

The most likely explanation seems to be that ____________ color does affect one’s mood, but the effects are different for girls and boys. However there are some similarities. Some results in the student survey were different from the cited research. Now it is obvious that colors have a great affect on mood.

References

Author last name, first initial. (date). title of article. date retrieved (if online publication), pages (if print publication) of the references cited.


Example Research Paper Scaffold (continued)
Workshop: The Successful Research Paper Assignment

1. **Encourage engagement and thoughtfulness**
   a. “Write a research paper on ______________.”
      i. Does not promote inquiry-based research
      ii. Does not help students understand why researchers find and use sources
   b. **Consider alternative “research paper” assignments**
      i. Diary or letters by a particular person or from a particular situation/event
      ii. Dialogue between two prominent people or two people representing different theories
      iii. Anthology with an introduction
      iv. Brochure or pamphlet
   c. **The Research Project guideline sheet**
      i. Describe learning objectives: content knowledge, research skills, writing skills
      ii. Clearly state expectations and grading criteria
      iii. Provide due dates for the (related) assignments or parts (see #2)

2. **Create an appropriate sequence of steps**
   a. **Several short assignments to improve students’ research skills**
      i. Brainstorm session to generate potential research questions
      ii. Annotated bibliography, summaries, or abstracts
      iii. Data-supplied essay
      iv. Short arguments (1-2 pages) using outside sources for support
   b. **Break the research project into parts**
      i. Guided Researcher’s Log/Journal to track development of ideas and decisions made (kept throughout the process)
      ii. Summary and evaluation of two articles (after a library orientation)
      iii. Prospectus, Progress Report, Letter to the Instructor, or Outline (after research question is finalized)
      iv. Reflective essay (if not using a log/journal) (2-3 weeks before final draft)
      v. Title and abstract (1 week before draft)
      vi. Draft (1-2 weeks before final draft)
      vii. Final draft

---

3. Decrease the possibility of plagiarism

a. Provide a definition of plagiarism. For example: Plagiarism is the use, whether intentional or unintentional, of someone else’s words, ideas, or images without correctly acknowledging the source of the words, ideas, or images. Plagiarism is serious academic misconduct and could result in failure of a course or expulsion from the university. See also page 574 of the 2004-05 Catalog.

b. Require that students take a plagiarism quiz. There are many online quizzes, e.g.:
   - http://library.camden.rutgers.edu/robeson/cddev/quiz.html
   - http://www.essex.ac.uk/plagiarism/Test.htm

c. State that plagiarism results in an “F” grade (either for the assignment or for the course) on the course syllabus or assignment sheet

d. Provide a discipline-specific library orientation. A list of Hamilton librarians by subject area can be found at

e. Teach how to read critically; teach how professionals in your field summarize, paraphrase, and use quotations

f. Use an alternative research paper assignment

g. Require different parts of the project to be turned in throughout the semester (see #2b)

h. Require a photocopy of the first page of each source used

i. Require reading notes, outlines, and preliminary drafts along with the final draft
Include Learning Objectives

Students appreciate instructors who explain what will be gained from completing the assignment. Include content knowledge, research skills, and writing skills objectives in a brief statement on the assignment guideline sheet.

After completing the research project assignment, you will be able to

- discuss in detail the major issues that frame your chosen research area;
- use the internet to locate research articles in the library’s electronic databases;
- critically analyze research articles;
- integrate other researcher’s ideas into your own argument (without plagiarizing);
- effectively and appropriately organize ideas in written report;
- present a credible argument in a written report.

Use Action Verbs to Convey Expectations

On an assignment sheet, use action verbs to precisely convey what students will need to do to successfully complete the assignment.

<table>
<thead>
<tr>
<th>Action verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>define</td>
</tr>
<tr>
<td>describe</td>
</tr>
<tr>
<td>identify</td>
</tr>
<tr>
<td>label</td>
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<tr>
<td>list</td>
</tr>
<tr>
<td>match</td>
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<tr>
<td>memorize</td>
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<td>point to</td>
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<td>recall</td>
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<td>select</td>
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<td>state</td>
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<td>alter</td>
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<td>account for</td>
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<tr>
<td>annotate</td>
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<tr>
<td>calculate</td>
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<tr>
<td>change</td>
</tr>
<tr>
<td>compile</td>
</tr>
<tr>
<td>convert</td>
</tr>
<tr>
<td>group</td>
</tr>
</tbody>
</table>
Brainstorm session

This activity conveys to students that developing a research question takes time and effort, that others can help the researcher improve upon his/her ideas, and that a researcher’s initial questions can serve as a catalyst to even better questions.

Your final project for this class is a research paper that will analyze an important current issue in education and provide a recommendation for action.
1) Take five minutes to brainstorm as many potential research questions about current issues as possible. Don’t stop writing – get as many questions on paper as possible.
2) After you’ve finished, review the list and select two questions that are particularly interesting to you.
3) For each question, write 1-3 sentences that explain why this issue is important to you.
4) Share one or both questions with a partner/small group. Ask your classmate(s) two questions: “Is this a feasible research question for this assignment?” and “What would you like to learn about [insert the current issue here].”
5) After completing the activity, revise your research question (if needed). Write 1-2 paragraphs in which you reflect on what you learned through this activity.

Data-supplied essay

Students may know how to locate data and research articles, but they may lack skills in interpreting and discussing the data. In the examples below, the instructor provides raw data. (Alternatively, the instructor may provide several short written passages from which students draw conclusions.)

Examples from Bean1:

Nursing: “Examine the attached unsorted data about Mary Smith, a stroke patient who is soon to be transferred from an acute-care facility to a convalescent center. Based on these data, write a discharge summary for Mary Smith. Your audience is the nursing supervisor of the convalescent facility, and your purpose is to help the convalescent center provide the patient with optimal continuity of care.”

Economics: “To what extent do the attached economic data support the hypothesis ‘Social service spending is inversely related to economic growth?’ First, create a scattergram as a visual test of the hypothesis. Then formulate a verbal argument analyzing whether the data do or do not support the hypothesis.”

Prompts to guide students’ thinking

These prompts and activities can be used in many different ways:
♦ a prompt for a Researcher’s Log/Journal entry
♦ part of a Prospectus, Progress Report, Letter to the Instructor, or Reflective Essay assignment
♦ stimulate student thinking about articles they read or their own thinking.

---

QUESTION EXPLORATION
• Take a blank piece of paper. Put a curiosity-based question in the middle of the page. Brainstorm related questions and write them down on the page, forming clusters or webs around the center question.

Review the web: Is one of the questions better than the question you started with?

Using the list of questions you generated, can you identify questions are directly related to or subordinate to your main question? (These directly-related questions may be sub-topics that are discussed in your research report.)

• What is your current research question? Why is answering this question important to you? Who else might be interested in your answer? Why? (1 page, typed)

• Choose one question that interests you. Spend no less than ten minutes freewriting on what you know about the topic. Don’t worry about whether what you write is correct or not. Push yourself to get down on paper all that you know, or think that you know, about the question. If you get stuck, write about how the question relates to your own experiences. Or write about why the question is important to you. Why do you want to find the answers to this question? You might be surprised at what you already know or think.

“NUTSHELL” STATEMENTS
• For my research project, I will try to learn _______ [insert your question here]. Answering the question is important to me because _______. The answer to my question is important to some other people because _______. In order to come up with the best answer to my question, I’m considering three strategies: a. _______. b._______. c. _____.

SELF-ASSESSMENT
• Write answers to these questions (1-2 pages)
  1. Where are you? (What have you accomplished so far?)
  2. What do you already know about the possible answers to your research question?
  3. What do you think will be your greatest challenge in answering your question?
  4. What do you most look forward to in doing your research?

PROGRESS REPORT
• In 2-3 pages, address these items:
  1. introduce the research question that you developed
  2. describe why you are interested in answering the question
  3. show how it is feasible for you to answer the question given the amount of time and resources available
  4. explain how your research question takes a fresh point of view or special angle (not merely repeats what others have already said)
  5. explain why the question is important and of interest to others
  6. describe what you have done or plan to do to come up with an answer to your question.
METHOD
• How might you best answer your question? (For example, survey current professionals or conduct a library search.) Why do you think this is the best way? What other methods did you consider? Why did you reject those methods?

• State your research question and summarize “in a nutshell” (in one sentence) the method that you will use to use to answer your question.

• Describe the method you will use to answer your question. Use enough detail so that a reader will clearly understand what you plan to do. (To help them write full descriptions, some students think of themselves telling a short story about what they plan to do.)
  A. What is your first task or set of tasks? Why is this first? Why is it important?
  B. What will you do next (and next, and next)? Why? What new questions or problems might this raise?

ENCOURAGE ACTIVE READING
• After students read a book, article, etc., ask them to answer questions like these:
  1. How does this resource add to your knowledge? What did you learn?
  2. To what extent is the resource based on research vs. opinion? If it is opinion, to what extent is it "expert" opinion? (How do you know?)
  3. How does it change your understanding of your research question and project? Any surprises?
  4. How does it confirm what you already know? What was expected?
  5. What connections can you make to your own life (your experiences, beliefs, attitudes)?
  6. How does this resource fit with your research question?

SIGNIFICANCE OF RESEARCH PROJECT
Questions to help students explore the significance of their project:
• Is it a small part of a bigger puzzle? Could your research project provide one piece of an important puzzle?
• Will answering your question lead to better understanding of a phenomenon or situation?
• Will your research project increase the knowledge about an object or text?
• Will your answers help explain characteristics of a group of people, a behavior, or situation?
• Will your answers provide possible solutions to a problem?
• Will your answers influence the development of public policy?
• Will your research project identify elements that can improve people’s lives (their health, job productivity, personal relationships, etc.)?
How to Assess and Provide Feedback for Scaffolded Assignments

- Peer Assessment
- Rubric Samples
Assessing Scaffolded Assignments

Case Study: The Narrative in New Media

WRIT 222. Professor Suzanne B. Spring, Colgate University

Describe your assignment design/structure.

The assignment structure for this course is a scaffolded structure: the assignments are sequential and are designed to aid students in gaining narrative expertise and fluency. We begin with composing textual narrative forms in a blog (posting) format and student writers engage with various narrative forms (which they have been studying through published narrative texts) and various narrative approaches to narrative composing, from word to sentence to paragraph levels; blog posts occur once each week for twelve weeks. At about week three, we begin work on the audio narrative, further building on narrative craft, yet centrally considering how sound composition, particularly through the spoken, conversational voice (a central characteristic of textual narratives), shifts in the audio format. The audio narrative is based in interview work of a narrative subject and the "narrative I" is negotiated as a predominantly subjective or objective narrator. Student writers compose a narrative frame that weaves in audio clips from their interviews. The third assignment of the visual narrative draws deeply on the audio assignment, but shifts to consider visual composition, particularly the ways that visual forms contribute to the work of gathering and crafting documentary details, which make the narrative come to life. In the last two weeks of class, we return to the serial blog and engage in peer critique and crafting of a final serial blog piece, number #13.

Describe how you evaluated the project outcomes? Did you evaluate process? Outcomes? Both?

I evaluate the three assignments according to rubrics designed specifically for each individual assignment. For each assignment, I introduce the rubric early and students are asked to answer a series of questions designed to evaluate their peers' ability in a first polished draft to fulfill the rubric criteria in a 1-2 page peer response letter. As well, students compose a rhetorical analysis that accompanies their final polished draft of the assignment; this analysis demands that they articulate how their piece fulfills the rubric's criteria and how the demands of their particular composition may even push past the limits of these criteria, introducing/re-theorizing the narrative as it takes form in relation to new media.

Video:
Assignment Structure:
http://www.youtube.com/watch?v=B8wpGVVUmrY&feature=player_embedded

http://academics.hamilton.edu/mediascholarship/index.cfm?PATH=narrativenewmedia.html
Scaffolding and Assessment

Gipps (1994) extends the notion of scaffolding to assessment. If improvement in work is to take place, the learner must know the purpose of the task and how far this has been achieved. They must be supported in ‘closing the gap’ (Black and Wiliam, 1998). In order to close the gap and improve learning through assessment, Black and Wiliam (1998) established that teachers need to:

• Share learning intentions
• Involve learners in self-evaluation
• Provide feedback which leads learners to recognise the next steps, and how to take them
• Be confident that every learner can improve and consider self-esteem.
## Section One - Philosophical Statement

- Clear statements of what you believe about teaching and learning
- Theoretical references about learning and pedagogy, articles read, discussions.
- Practical experiences you’ve had that support your perspectives
- Specific examples of what you mean in practice – what would your beliefs look like?
**Section Two - Description and Analysis of Teaching Design**

<table>
<thead>
<tr>
<th><strong>Excellent</strong></th>
<th><strong>Good</strong></th>
<th><strong>Not Evident</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

- List at least three learning goals for a real or imaginary course.
- Write a summary of an assignment, exercise, pedagogical strategy that will help students toward achieving the learning goals you listed.
- Provide step by step procedures of what you would do and what the students would do.
- Provide a brief summary of the context for this course – the size, class level, discipline, etc.
- Provide a rationale supporting your design by using class materials, and personal experiences.

**Supporting Artifact(s) Provided**
<table>
<thead>
<tr>
<th>Section Three Assessment of Teaching/Learning Design</th>
<th>Excellent</th>
<th>Good</th>
<th>Not Evident</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ How likely is the strategy to achieve its intended outcome?</td>
<td></td>
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</tr>
<tr>
<td>▪ How will you know? What kind of formative assessment would you implement?</td>
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<tr>
<td>▪ What would you change about the design if you could?</td>
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</tr>
</tbody>
</table>

Overall Comments:
### COMMUN 101: INTRODUCTION TO INTERPERSONAL COMMUNICATION
TERM PAPER GRADING CRITERIA

#### INTRODUCTION

<table>
<thead>
<tr>
<th>Grading Criteria</th>
<th>Exemplary (10-8)</th>
<th>Acceptable (7-5)</th>
<th>Marginal (4-2)</th>
<th>Limited (1-0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper objective (10)</td>
<td>Introduction grasps reader’s attention and forecasts major points. Writer’s concepts are readily apparent to the reader.</td>
<td>Some introduction; nothing beyond a forecast. Writing has concepts articulated.</td>
<td>Basic objective and concepts are not consistently clear. Introduction is poor.</td>
<td>Introduction is lacking. Writer’s concepts and purpose are generally unclear.</td>
</tr>
<tr>
<td>Movie summary (10)</td>
<td>Exceptional understanding evidenced with an overview of plot summary and thorough introduction of characters.</td>
<td>Appropriate and ordinary understanding; introduction of characters/story.</td>
<td>Incomplete/inaccurate plot summary and/or superficial understanding of the story/characters.</td>
<td>Inadequate plot summary and failure to introduce characters.</td>
</tr>
</tbody>
</table>

#### BODY: Concept One/Two/Three

<table>
<thead>
<tr>
<th>Grading Criteria</th>
<th>Exemplary (10-8)</th>
<th>Acceptable (7-5)</th>
<th>Marginal (4-2)</th>
<th>Limited (1-0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thorough concept explanation (10)</td>
<td>Topic is narrow and manageable. Writer gives specific definition with correct APA format and examples to further explain concept.</td>
<td>Topic is appropriate and manageable. Only the concept definition is given; further explanation is not apparent. APA format is used with minor errors.</td>
<td>Concept is fairly broad. Writer does not give an adequate definition and has frequent APA errors.</td>
<td>Writer has too broad a concept and/or does not specify concept. No citation and/or does not use APA format.</td>
</tr>
<tr>
<td>Discuss scene specifics (10)</td>
<td>One scene is fittingly selected and provides a detailed description about what is happening in the scene (who, what, where, when, and why) and depicts nonverbal and verbal communication.</td>
<td>Basic verbal and nonverbal communication is depicted with some detail usage. Description establishes relations between the concept and scene.</td>
<td>One/many scenes are depicted with little details provided. Vague description is given for nonverbal and verbal communication within the scene.</td>
<td>No evidence of nonverbal and verbal descriptions within the scene. Scene description does not provide adequate grounds for analysis and interpretation.</td>
</tr>
<tr>
<td>Grading Criteria</td>
<td>Exemplary (10-8)</td>
<td>Acceptable (7-5)</td>
<td>Marginal (4-2)</td>
<td>Limited (1-0)</td>
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</tr>
<tr>
<td><strong>Analysis of concept in accordance to the scene (10)</strong></td>
<td>Balanced presentation of relevant and accurate details clearly supports the scene and shows a thoughtful, in-depth analysis of the concept within the scene going beyond the obvious.</td>
<td>Information provides reasonable support for concept within the scene and displays evidence of a basic analysis of the concept.</td>
<td>Writer gives information to support concept at times. Analysis is basic and general and fails to go into specifics.</td>
<td>Analysis of elements and relationship to characters/concept is vague and not evident. Reader is confused. Concept is not clearly identified in the scene explanation.</td>
</tr>
<tr>
<td><strong>Interpretation concept within the scene selected (10)</strong></td>
<td>Reader gains important insights to scene, concept, and movie. Content is based on logical connections and accurate assessment of scene in conjunction with the concept.</td>
<td>Reader gains some insights. Writer gives some logical connections and assessment.</td>
<td>Reader gains few insights. Ideas fail to make sense together or are not sufficiently developed to provide reader understanding.</td>
<td>No evidence of new thought and insight into the scene using the concept.</td>
</tr>
<tr>
<td><strong>Evaluate communicative strengths and weaknesses (5)</strong></td>
<td>At least one strength and one weakness are explicitly and satisfactorily explained and fit the scene context. (5)</td>
<td>Only one strength and one weakness are given and they haphazardly apply to the specific scene analyzed. (4-3)</td>
<td>Writer identifies one strength or weakness and does not articulate/support it with explicit evidence. (2-1)</td>
<td>No strengths or weaknesses are explicitly noted in the paper. (0)</td>
</tr>
<tr>
<td><strong>Suggestions for communicative improvement (5)</strong></td>
<td>Two explicit and appropriate improvements are suggested to the relationship or scene. (5)</td>
<td>One explicitly stated improvement is suggested for the scene. (4-3)</td>
<td>Only implicit communication improvements are given for the scene. (2-1)</td>
<td>No improvements are suggested for the scene. (0)</td>
</tr>
</tbody>
</table>

*Note: Definitions*

**Analysis:** an examination of a complex, its elements, and their relations

**Interpretation:** to explain or tell the meaning of; present in understandable terms
<table>
<thead>
<tr>
<th>CONTENT</th>
<th>Excellent</th>
<th>Good</th>
<th>Needs Improvement</th>
<th>Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Argument</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Thesis</strong></td>
<td>A clear statement of the main conclusion of the paper.</td>
<td>The thesis is obvious, but there is no single clear statement of it.</td>
<td>The thesis is present, but must be uncovered or reconstructed from the text of the paper.</td>
<td>There is no thesis.</td>
</tr>
<tr>
<td><strong>Premises</strong></td>
<td>Each reason for believing the thesis is made clear, and as much as possible, presented in single statements. It is also clear which premises are to be taken as given, and which will be supported by sub-arguments. The paper provides sub-arguments for controversial premises. If there are sub-arguments, the premises for these are clear, and made in single statements. The premises which are taken as given are at least plausibly true.</td>
<td>The premises are all clear, although each may not be presented in a single statement. It is also pretty clear which premises are to be taken as given, and which will be supported by sub-arguments. The paper provides sub-arguments for controversial premises. If there are sub-arguments, the premises for these are clear. The premises which are taken as given are at least plausibly true.</td>
<td>The premises must be reconstructed from the text of the paper. It is not made clear which premises are to be taken as given, and which will be supported by sub-arguments. There are no sub-arguments, or, if there are sub-arguments, the premises for these are not made clear. The paper does not provide sub-arguments for controversial premises. The plausibility of the premises which are taken as given is questionable.</td>
<td>There are no premises—the paper merely restates the thesis. Or, if there are premises, they are much more likely to be false than true.</td>
</tr>
<tr>
<td><strong>Support</strong></td>
<td>The premises clearly support the thesis, and the author is aware of exactly the kind of support they provide. The argument is either valid as it stands, or, if invalid, the thesis, based on the premises, is likely to be or plausibly true.</td>
<td>The premises support the thesis, and the author is aware of the general kind of support they provide. The argument is either valid as it stands, or, if invalid, the thesis, based on the premises, is likely to be or plausibly true.</td>
<td>The premises somewhat support the thesis, but the author is not aware of the kind of support they provide. The argument is invalid, and the thesis, based on the premises, is not likely to be or plausibly true.</td>
<td>The premises do not support the thesis.</td>
</tr>
<tr>
<td><strong>Counter-Arguments</strong></td>
<td>The paper considers both obvious and unobvious counter-examples, counter-arguments, and/or opposing positions, and provides original and/or thoughtful responses.</td>
<td>The paper considers obvious counter-examples, counter-arguments, and/or opposing positions, and provides responses.</td>
<td>The paper may consider some obvious counter-examples, counter-arguments, and/or opposing positions, but some obvious ones are missed. Responses are non-existent or mere claims of refutation.</td>
<td>No counter-examples, counter-arguments, or opposing positions are considered.</td>
</tr>
<tr>
<td>Understanding</td>
<td>Text</td>
<td>Ideas</td>
<td>Analysis</td>
<td>Synthesis</td>
</tr>
<tr>
<td>---------------</td>
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</tr>
<tr>
<td><strong>Text</strong></td>
<td>The paper contains highly accurate and precise summarization, description and/or paraphrasing of text. The paper uses appropriate textual support for these.</td>
<td>The summarization, description and/or paraphrasing of text is fairly accurate and precise, and has textual support, but other passages may have been better choices.</td>
<td>The summarization, description and/or paraphrasing of text is fairly accurate, but not precise, and the textual support is inappropriate.</td>
<td>The summarization, description and/or paraphrasing of text is inaccurate and/or has no textual support.</td>
</tr>
<tr>
<td><strong>Ideas</strong></td>
<td>The paper contains a highly accurate and precise description of the issue or problem, along with a careful consideration of possible alternatives or solutions. The paper contains relevant examples, and indicates the salient issues the examples highlight.</td>
<td>The description of the problem or issue is fairly accurate and precise, and possible alternatives or solutions are considered. Examples are given, but similar examples may have been better.</td>
<td>The description of the problem or issue is fairly accurate but not precise, and possible alternatives or solutions are either not considered, or ill-described. Examples are given, but it is not made clear how they are relevant.</td>
<td>The parts identified are not the correct and/or relevant ones. The connections between the parts are completely inaccurate.</td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td>The paper successfully breaks the argument, issue, or problem into relevant parts. The connections between the parts are clear and highly accurate.</td>
<td>The paper successfully breaks the argument, issue, or problem into relevant parts. The connections between the parts are fairly accurate.</td>
<td>The paper breaks the argument, issue, or problem into parts, but some parts may be missing or unclear. The connections between the parts are somewhat accurate.</td>
<td>The parts identified are not the correct and/or relevant ones. The connections between the parts are completely inaccurate.</td>
</tr>
<tr>
<td><strong>Synthesis</strong></td>
<td>The paper successfully integrates all relevant parts from various places into a coherent whole. The connections between the parts are clear and insightful.</td>
<td>The paper integrates most relevant parts from various places into a mostly coherent whole. The connections between the parts are generally clear.</td>
<td>The parts identified are not the correct and/or relevant ones. The connections between the parts are completely inaccurate.</td>
<td>The parts to be integrated are not clear and/or relevant. The connections between the parts are unclear.</td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td>The paper evaluates the argument in question by checking for adherence to various standards (validity, soundness, etc.), and checking for informal fallacies. The paper suggests how the argument could be made better according to the appropriate standard.</td>
<td>The paper evaluates the argument in question by checking for adherence to various standards (validity, soundness, etc.), and checking for informal fallacies.</td>
<td>The paper evaluates the argument in question by checking only the truth of the premises and/or the conclusion, and does not check for informal fallacies.</td>
<td>The paper evaluates the argument in question by checking only the truth of the premises and/or the conclusion, and does not check for informal fallacies.</td>
</tr>
<tr>
<td>Position</td>
<td>The paper evaluates the position in question by checking for support in an argument and internal consistency, and by exploring unmentioned plausible alternatives.</td>
<td>The paper evaluates the position in question by checking for support in an argument and internal consistency.</td>
<td>The paper evaluates the position in question by considering its plausibility.</td>
<td>The paper evaluates the position in question by whether the author agrees or disagrees with it.</td>
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<tr>
<td><strong>Creation</strong></td>
<td></td>
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</tr>
<tr>
<td>Thesis</td>
<td>Thesis is original, interesting, and relevant.</td>
<td>The thesis is interesting and relevant.</td>
<td>The thesis is slightly off-topic, obviously true (or false), or not really worth writing about.</td>
<td>The thesis is totally irrelevant.</td>
</tr>
<tr>
<td>Examples</td>
<td>Examples are original, relevant, insightful, and well-used.</td>
<td>Examples are original, relevant, and well-used.</td>
<td>Examples are unoriginal, only somewhat relevant, and/or not well-used.</td>
<td>Examples are missing, irrelevant and/or misused.</td>
</tr>
<tr>
<td>Alternative Positions</td>
<td>Previously unmentioned alternative positions are explored.</td>
<td>Alternative positions are explored.</td>
<td>Alternative positions are mentioned but not explored.</td>
<td>Alternative positions are ignored.</td>
</tr>
<tr>
<td><strong>STYLE</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Clarity</td>
<td>All sentences are complete and grammatical. All words are chosen for their precise meanings. All new or unusual terms are well-defined. Key concepts and theories are accurately and completely explained. Good, clear examples are used to illuminate concepts and issues. Information (names, facts, etc.) is accurate. Paper has been spell-checked and proofread, and has no errors, and no rhetorical questions or slang.</td>
<td>All sentences are complete and grammatical. Most words are chosen for their precise meanings. Most new or unusual terms are well-defined. Key concepts and theories are explained. Examples are clear. Information (names, facts, etc.) is accurate. Paper has been spell-checked and proofread, and has very few errors, and no rhetorical questions or slang.</td>
<td>A few sentences are incomplete and/or ungrammatical. Words are not chosen for their precise meanings. New or unusual terms are not well-defined. Key concepts and theories are not explained. Examples are not clear. Information (names, facts, etc.) is mostly accurate. Paper has several spelling errors, rhetorical questions and/or uses of slang.</td>
<td>Many sentences are incomplete and/or ungrammatical. The author does not acknowledge that key words have precise meanings. Information (names, facts, etc.) is inaccurate. Paper has many spelling errors, rhetorical questions and/or uses of slang.</td>
</tr>
<tr>
<td>Organization</td>
<td>Introduction</td>
<td>Body</td>
<td>Conclusion</td>
<td>Conclusion</td>
</tr>
<tr>
<td>--------------</td>
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<tr>
<td>Thesis is clear, and contained in the introduction. The topic is introduced with minimal fanfare. It is made clear how the paper will get to this conclusion, not in a detailed outline of the paper, but rather in a concise summary of the steps in argument.</td>
<td>Thesis is contained in the introduction. The topic is introduced with little fanfare. It is generally clear how the paper will get to this conclusion, not in a detailed outline of the paper, but rather in a description of the steps in argument.</td>
<td>Thesis is not contained in the introduction. The topic is introduced with too much fanfare. The flow of the paper is described as an outline, and not as a description of the steps in argument.</td>
<td>Only the topic is introduced, with no description of the paper. Or, the paper is described inaccurately.</td>
<td></td>
</tr>
<tr>
<td>It is very easy to follow the argument. It is made explicit which claims are being used as premises, and how these premises are supposed to support the thesis. New premises are each introduced in new paragraphs or sections. If there are sub-arguments, it is made explicit which argument is the main one, and which are the secondary ones.</td>
<td>It is generally easy to follow the argument. It is clear which claims are being used as premises, and how these premises are supposed to support the thesis. Usually, new premises are introduced in new paragraphs or sections. If there are sub-arguments, it is clear which argument is the main one, and which are the secondary ones.</td>
<td>It is somewhat difficult to follow the argument. It is somewhat unclear which claims are being used as premises, and/or how these premises are supposed to support the thesis. Separate premises are lumped together in the same paragraphs or sections. If there are sub-arguments, it is not clear which argument is the main one, and which are the secondary ones.</td>
<td>It is impossible to follow the argument. It is completely unclear which claims are being used as premises. It is completely unclear how the premises are supposed to support the thesis. Premises are discussed randomly, or not at all. There seem to be many arguments, and it is completely unclear which is the main one.</td>
<td></td>
</tr>
<tr>
<td>The paper uses the conclusion to tie up loose ends. For example, the paper considers objections to the argument to which it is acknowledged there is no space or expertise to respond. Or, the paper briefly considers the implications of the acceptance of the conclusion for a larger argument, or for a larger issue or problem. Or the paper explains what further work may need to be done in this area.</td>
<td>The paper uses the conclusion to tie up some loose ends, but combines this with a restatement of the introduction.</td>
<td>The conclusion is merely a restatement of the introduction.</td>
<td>The conclusion is missing.</td>
<td></td>
</tr>
<tr>
<td>Dimension</td>
<td>Sophisticated</td>
<td>Competent</td>
<td>Needs Work</td>
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</tr>
<tr>
<td><strong>Introduction</strong></td>
<td>Position and exceptions, if any, are clearly stated. Organization of the argument is completely and clearly outlined and implemented. 4-5 pts</td>
<td>Position is clearly stated. Organization of argument is clear in parts or only partially described and mostly implemented. 2-3 pts</td>
<td>Position is vague. Organization of argument is missing, vague, or not consistently maintained. 0-1 pts</td>
<td></td>
</tr>
<tr>
<td><strong>Research</strong></td>
<td>Research selected is highly relevant to the argument, is presented accurately and completely – the method, results, and implications are all presented accurately; Theory is relevant, accurately described and all relevant components are included; relationship between research and theory is clearly articulated and accurate. 8–10 pts</td>
<td>Research is relevant to the argument and is mostly accurate and complete – there are some unclear components or some minor errors in the method, results or implications. Theory is relevant and accurately described, some components may not be present or are unclear. Connection to theory is mostly clear and complete, or has some minor errors. 5 – 7 pts</td>
<td>Research selected is not relevant to the argument or is vague and incomplete – components are missing or inaccurate or unclear. Theory is not relevant or only relevant for some aspects; theory is not clearly articulated and/or has incorrect or incomplete components. Relationship between theory and research is unclear or inaccurate, major errors in the logic are present. 0 – 4 pts</td>
<td></td>
</tr>
<tr>
<td><strong>Conclusions</strong></td>
<td>Conclusion is clearly stated and connections to the research and position are clear and relevant. The underlying logic is explicit. 4-5 pts</td>
<td>Conclusion is clearly stated and connections to research and position are mostly clear, some aspects may not be connected or minor errors in logic are present. 2-3 pts</td>
<td>Conclusion may not be clear and the connections to the research are incorrect or unclear or just a repetition of the findings without explanation. Underlying logic has major flaws; connection to position is not clear.</td>
<td></td>
</tr>
<tr>
<td><strong>Writing</strong></td>
<td>Paper is coherently organized and the logic is easy to follow. There are no spelling or grammatical errors and terminology is clearly defined. Writing is clear and concise and persuasive. 4-5 pts</td>
<td>Paper is generally well organized and most of the argument is easy to follow. There are only a few minor spelling or grammatical errors, or terms are not clearly defined. Writing is mostly clear but may lack conciseness. 2-3 pts</td>
<td>Paper is poorly organized and difficult to read – does not flow logically from one part to another. There are several spelling and/or grammatical errors; technical terms may not be defined or are poorly defined. Writing lacks clarity and conciseness. 0-1 pts</td>
<td></td>
</tr>
</tbody>
</table>
Essay and Research Paper Grading Rubric

Professor Jay Aronson
Carnegie Mellon University
aronson@andrew.cmu.edu

<table>
<thead>
<tr>
<th>Overall Impression</th>
<th>Excellent</th>
<th>Good</th>
<th>Needs Improvement</th>
<th>Poor</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author directly addresses main question or issue, and adds new insight to the subject not provided in lectures, readings, or class discussions. The author has retained nearly all of the knowledge presented in class. He/She is able to synthesize this knowledge in new ways and relate to material not covered in the course.</td>
<td>Author competently addresses main question or issue, but does not add much new insight into the subject. That said, it is clear that the author has learned a great deal in class and is able to communicate this knowledge to others.</td>
<td>Author attempts to address main question or issue, but fails. The author has retained some information from the course, but does not fully understand its meaning or context and cannot clearly convey it to others.</td>
<td>Essay does NOT address main question or issue, and it is obvious that author has not retained any information from the course.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Argument | Essay contains a clear argument—i.e., lets the reader know exactly what the author is trying to communicate. | An argument is present, but reader must reconstruct it from the text. | Author attempts, but fails, to make an argument (e.g., starts with a rhetorical question/statement or anecdote that is never put into context). | No attempt is made to articulate an argument. |   |

| Evidence | Provides compelling and accurate evidence that convinces reader to accept main argument. The importance/relevance of all pieces of evidence is clearly stated. There are no gaps in reasoning—i.e., the reader does not need to assume anything or do additional research to accept main argument. | Provides necessary evidence to convince reader of most aspects of the main argument but not all. The importance/relevance of some evidence presented may not be totally clear. Reader must make a few mental leaps or do some additional research to fully accept all aspects of main argument. | Not enough evidence is provided to support author’s argument, or evidence is incomplete, incorrect, or oversimplified. Information from lectures and readings is not effectively used. | Either no evidence is provided, or there are numerous factual mistakes, omissions or oversimplifications. There is little or no mention of information from lectures and readings. |   |

98
<table>
<thead>
<tr>
<th>Counter-Evidence</th>
<th>Excellent</th>
<th>Good</th>
<th>Needs Improvement</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>The author considers the evidence, or alternate interpretations of evidence, that could be used to refute or weaken his/her argument, and thoughtfully responds to it.</td>
<td>Author acknowledges that counter-evidence or alternative interpretations exists, and lists them fully, but does not effectively explain to reader why his/her argument still stands.</td>
<td>Author acknowledges some of the most obvious counter-evidence and alternative explanations, but is not comprehensive in this task. There is little or no attempt made to respond to them.</td>
<td>No acknowledgement of counter-evidence or alternative interpretations.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sources</th>
<th>Excellent</th>
<th>Good</th>
<th>Needs Improvement</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence is used from a wide range of sources, including lectures and course readings. When required, author also consults scholarly books, websites, journal articles, etc. not explicitly discussed in class.</td>
<td>Evidence is used from many sources, but author relies heavily on a more limited set of sources. Some effort is made to go beyond material presented in class when required, but not much. If outside sources are used, they are primarily non-scholarly (i.e., intended for a general audience) and/or web-based.</td>
<td>Uses only a few of the sources provided in class, or does not go beyond what has been provided by professor when required to do additional research.</td>
<td>Does not use sources, only minimally uses sources provided by instructor, or relies exclusively on non-scholarly outside sources.</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** You should always consult the assignment description to find out what kinds of sources are required.

<table>
<thead>
<tr>
<th>Citations</th>
<th>Excellent</th>
<th>Good</th>
<th>Needs Improvement</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>All evidence is properly cited in footnotes or endnotes.</td>
<td>All evidence is cited in footnotes or endnotes, but there are some minor problems with completeness or format of some citations.</td>
<td>Some pieces are unreferenced or inaccurately referenced, and there are problems with completeness and format of citations.</td>
<td>No attempt is made to cite evidence.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Excellent</td>
<td>Good</td>
<td>Needs Improvement</td>
<td>Poor</td>
</tr>
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<td>--------------------------</td>
<td>---------------------------------------------------------------------------</td>
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<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Organization</td>
<td>Essay contains an intro, main body, and conclusion. Introduction lays out main argument and gives an outline of what the reader can expect in the essay. The conclusion brings everything together, acknowledges potential shortcomings of the paper, and gives the reader a sense of what further work might be done to advance the subject matter described in the paper.</td>
<td>Essay contains an intro, main body, and conclusion. The introduction lays out the main argument but gives the reader little idea of what to expect in the essay. The conclusion nicely summarizes the main argument and evidence, but does not move beyond what has already been presented in the paper.</td>
<td>Essay contains an intro, main body, and conclusion. The introduction gives the reader an idea of what to expect in the paper, but does not effectively lay out the main argument. It may begin with a set of rhetorical questions, or an anecdote that is never fully explained. The conclusion does little more than restate the problematic introduction. Intro and/or conclusion may be too wordy or short.</td>
<td>Essay has no clear organizational pattern.</td>
</tr>
<tr>
<td>Clarity and Style</td>
<td>All sentences are grammatically correct and clearly written. No words are misused or unnecessarily fancy. Technical terms, words from other languages, and words from other historical periods are always explained. All information is accurate and up-to-date. Paper has been spell-checked AND proofread (ideally by you and somebody else), and contains no errors.</td>
<td>All sentences are grammatically correct and clearly written. An occasional word is misused or unnecessarily fancy. Technical terms, words from other languages, and words from other historical periods are usually, but not always, explained. All information is accurate and up-to-date. Paper has been spell-checked AND proofread, and contains no more than a few minor errors, which do not adversely affect the reader’s ability to understand the essay.</td>
<td>A few sentences are grammatically incorrect or not clearly written. Several words are misused. Technical terms, words from other languages, and words from other historical periods are rarely explained. Not all information is accurate and up-to-date. Paper has been spell-checked AND proofread, but still contains several errors. Reader’s ability to understand essay may be compromised by these errors.</td>
<td>Paper is full of grammatical errors and bad writing. Several words are misused. Technical terms, words from other languages, and words from other historical periods are rarely explained. Not all information is accurate and up-to-date. Paper has not been spell-checked or proofread, and contains numerous errors. Reader has a difficult time understanding essay because of errors.</td>
</tr>
</tbody>
</table>
## Research Paper Rubric - Final Draft

<table>
<thead>
<tr>
<th>Category</th>
<th>A: Exemplary</th>
<th>B: Solid</th>
<th>C: Competent</th>
<th>F: Insufficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective or Thesis</td>
<td>Thesis is clearly stated and appropriately focused, prompting a “So what?” exploration.</td>
<td>Thesis is clearly stated, but focus could have been sharper or more compelling.</td>
<td>Thesis does not lend itself to readily available answers.</td>
<td>No statement of thesis or objective for research.</td>
</tr>
<tr>
<td>Information Sources</td>
<td>Information comes from a rich variety of quality electronic and print sources, including critical readings relating to the thesis or problem.</td>
<td>Information comes from both print and electronic sources but some sources are of questionable value.</td>
<td>Student relies significantly more on either print or electronic sources and displays minimal effort in selecting quality sources.</td>
<td>Sources are not compelling in either variety or quality.</td>
</tr>
<tr>
<td>Analysis</td>
<td>Student carefully analyzes the information collected and draws appropriate and inventive conclusions supported by evidence.</td>
<td>Student shows good effort in analyzing the evidence collected.</td>
<td>Conclusions could be supported by stronger evidence. Level of analysis is superficial.</td>
<td>Conclusions are little more than restatements of information or not adequately supported by evidence.</td>
</tr>
<tr>
<td>Organization</td>
<td>The introduction, body, and conclusion are organized and presented in such a clear and creative way that the reader moves easily through the text.</td>
<td>The organizational structure is strong enough to move the reader through the text without undue confusion.</td>
<td>The organizational structure is stilted and predictable without flair in either the introduction or conclusion.</td>
<td>The information appears to be disorganized.</td>
</tr>
<tr>
<td>Content Integration</td>
<td>The essay smoothly integrates the writer’s ideas, “quotable” quotations, and paraphrasing.</td>
<td>The essay relies more on ideas from the research than on the writer’s response even though quotes are “quotable” and paraphrasing is solid.</td>
<td>The essay demonstrates little of the writer’s own ideas in response to the research, relying on quotes poorly connected.</td>
<td>The essay leans heavily toward stringing together quoted material without thoughtfully responding to it or carefully shaping it.</td>
</tr>
<tr>
<td>Writing Style</td>
<td>Beyond being correct, sentences are varied in length and type.</td>
<td>Sentences are correct but not varied.</td>
<td>Short, simple and compound sentences prevail.</td>
<td>Sentence errors, such as fragments and run-ons, detract from the reading.</td>
</tr>
<tr>
<td>Mechanics</td>
<td>No grammatical, spelling or punctuation errors.</td>
<td>Almost no grammatical, spelling or punctuation errors.</td>
<td>A few grammatical, spelling or punctuation errors.</td>
<td>Many grammatical, spelling or punctuation errors.</td>
</tr>
<tr>
<td>Documentation of Sources</td>
<td>All sources (information and graphics) are documented internally according to the MLA format.</td>
<td>All sources (information and graphics) are documented internally, but a few are not in the MLA format.</td>
<td>All sources (information and graphics) are documented internally, but many are not in the MLA format.</td>
<td>Some sources are not documented.</td>
</tr>
<tr>
<td></td>
<td><strong>Sophisticated</strong></td>
<td><strong>Highly Competent</strong></td>
<td><strong>Fairly Competent</strong></td>
<td><strong>Not Yet Competent</strong></td>
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</tr>
<tr>
<td><strong>Depth of analysis</strong></td>
<td>Paper goes beyond the assignment to explore the implications of arguments or evidence in new contexts or in particularly thoughtful, insightful, and/or original ways. Paper shows a nuanced grasp of anthropological principles and the ability to apply these principles with facility.</td>
<td>Paper fully meets the parameters of the assignment but does not exceed them. Paper demonstrates a good grasp of anthropological principles but some awkwardness applying them.</td>
<td>Paper does not address some aspects of the assignment. (and/or…) Paper demonstrates a somewhat shaky grasp of anthropological principles.</td>
<td>Paper does not address the assignment. (and/or…) Paper is inconsistent with anthropological principles (i.e. it makes or fails to challenge ethnocentric assumptions.)</td>
</tr>
<tr>
<td><strong>Grasp of reading(s)</strong></td>
<td>Paper represents the authors’ arguments, evidence and conclusions accurately, fairly and eloquently. Demonstrates a firm understanding of the implications of the author’s arguments.</td>
<td>Paper represents the author’s arguments, evidence and conclusions accurately.</td>
<td>Paper represents the authors’ arguments, evidence and conclusions accurately though not sufficiently clearly. (and/or…) There are minor inaccuracies.</td>
<td>Paper badly misrepresents the authors’ arguments, evidence, and/or conclusions.</td>
</tr>
<tr>
<td><strong>Thesis paragraph</strong></td>
<td>Clearly and eloquently identifies a demonstrable and nuanced central argument. Provides the reader with a clear sense of the nature of evidence that will follow. Reveals the organizational structure of the paper. Guides the reader smoothly and logically into the body of the paper.</td>
<td>Thesis paragraph clearly identifies a demonstrable central argument. Gives the reader a reasonably good sense of the nature of evidence that will follow.</td>
<td>Thesis paragraph identifies a central argument that is demonstrable, though not stated sufficiently clearly. (and/or…) Does not guide the reader into the body of the paper.</td>
<td>Thesis paragraph does not have a discernable central argument (and/or…) The argument is not demonstrable.</td>
</tr>
<tr>
<td><strong>Evidence</strong></td>
<td>Evidence used to support the central point is rich, detailed and well chosen. Evidence sections employ appropriate illustrations and/or quotations. The connection between argument and evidence is clearly articulated.</td>
<td>Evidence used to support the central point is well chosen, though not particularly rich or detailed.</td>
<td>Connection between argument and evidence is not clearly articulated in all cases. (and/or…)</td>
<td>Evidence used does not clearly support the main argument. (and/or…) (Where applicable) Important opposing evidence is ignored, thereby weakening the central argument.</td>
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<tr>
<td>Conclusion</td>
<td>Elegantly synthesizes and reframes key points from the paper.</td>
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<td></td>
<td>Synthesizes and brings closure but does not examine new perspectives or questions.</td>
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<td>Restates the same points as the topic paragraph without reframing them. (and/or…)</td>
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<td></td>
<td>Introduces new material rather than new perspectives.</td>
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<td>Is missing or cursory. (and/or…)</td>
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<tr>
<td></td>
<td>Repeats the topic paragraph more-or-less verbatim.</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organization</th>
<th>Organization of paper as a whole is logical and quickly apparent.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Connections among paragraphs are clearly articulated.</td>
</tr>
<tr>
<td></td>
<td>Transitions between paragraphs are smooth.</td>
</tr>
<tr>
<td></td>
<td>Every paragraph makes one distinct and coherent point and, for the most part, the parts of each paragraph connect logically and effectively.</td>
</tr>
<tr>
<td></td>
<td>In all but a few cases, the paragraph’s point is expressed in a clear topic sentence.</td>
</tr>
<tr>
<td></td>
<td>Organization of the paper as a whole can only be discerned with effort. (and/or…)</td>
</tr>
<tr>
<td></td>
<td>Not all parts of the paper fit the organizational structure. (and/or…)</td>
</tr>
<tr>
<td></td>
<td>Not all the parts of the paper are effectively integrated. In a number of paragraphs, there is not a distinct or coherent point. (and/or)</td>
</tr>
<tr>
<td></td>
<td>Topic sentences are missing or unclear in a number of paragraphs. (and/or)</td>
</tr>
<tr>
<td></td>
<td>In a number of paragraphs, the parts do not connect logically.</td>
</tr>
<tr>
<td></td>
<td>Organization of the paper as a whole is not logical or discernable.</td>
</tr>
<tr>
<td>Clarity</td>
<td>Throughout the paper, wording is precise and unambiguous. Sentence structure is consistently clear and lucid. Quotations are all framed effectively in the text (i.e. integrated properly in terms of both grammar and meaning) and explicated where necessary.</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Mechanics</td>
<td>Paper is clean and appropriately formatted. There are no incomplete or run-on sentences. Quotes are all properly attributed and cited. There are virtually no spelling or grammatical errors.</td>
</tr>
</tbody>
</table>

**COMMENTS:**
___________________________________________________________________________________________________________________________
___________________________________________________________________________________________________________________________
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___________________________________________________________________________________________________________________________

104
# Design Project Assessment Rubric

<table>
<thead>
<tr>
<th>Topic (Weight)</th>
<th>Unacceptable (0)</th>
<th>Marginal (1)</th>
<th>Acceptable (2)</th>
<th>Exceptional (3)</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design Problem and Boundaries</strong> (1)</td>
<td>θ Little or no grasp of problem. Incapable of producing a successful solution.</td>
<td>θ Some understanding of problem. Major deficiencies that will impact the quality of solution.</td>
<td>θ Overall sound understanding of the problem and constraints. Does not significantly impair solution.</td>
<td>θ Clear and complete understanding of design goal and constraints.</td>
<td></td>
</tr>
<tr>
<td><strong>Alternative Designs</strong> (2)</td>
<td>θ Only one design presented or clearly infeasible alternative given.</td>
<td>θ Serious deficiencies in exploring and identifying alternative designs.</td>
<td>θ Alternative approaches identified to some degree.</td>
<td>θ Final design achieved after review of reasonable alternatives.</td>
<td></td>
</tr>
<tr>
<td><strong>Use of Computer-Aided Tools</strong> (2)</td>
<td>θ Serious deficiencies in understanding the correct selection and/or use of tools.</td>
<td>θ Minimal application and use of appropriate tools.</td>
<td>θ Computer-aided tools used with moderate effectiveness to develop designs.</td>
<td>θ Computer-aided tools are used effectively to develop and analyze designs.</td>
<td></td>
</tr>
<tr>
<td><strong>Application of Engineering Principles</strong> (2)</td>
<td>θ No or erroneous application of engineering principles yielding unreasonable solution.</td>
<td>θ Serious deficiencies in proper selection and use of engineering principles.</td>
<td>θ Effective application of engineering principles resulting in reasonable solution.</td>
<td>θ Critical selection and application of engineering principles ensuring reasonable results.</td>
<td></td>
</tr>
<tr>
<td><strong>Final Design</strong> (3)</td>
<td>θ Not capable of achieving desired objectives. No implementation of resource conservation and recycle strategies.</td>
<td>θ Barely capable of achieving desired objectives. Minimal utilization of resource conservation and recycle potentials.</td>
<td>θ Design meets desired objectives. Moderately effective utilization of resource conservation and recycle potentials.</td>
<td>θ Design meets or exceeds desired objectives. Effective implementation of resource conservation and recycle strategies.</td>
<td></td>
</tr>
<tr>
<td><strong>Process Economics</strong> (1)</td>
<td>θ No or totally erroneous cost estimates presented.</td>
<td>θ Reasonable cost estimates presented, but no profitability analysis included.</td>
<td>θ Reasonable profitability analysis presented, but no interpretation of the results.</td>
<td>θ Effective use of profitability analysis leading to improvement recommendations.</td>
<td></td>
</tr>
<tr>
<td><strong>Interpretation of Results</strong> (2)</td>
<td>θ No or erroneous conclusions based on achieved results.</td>
<td>θ Serious deficiencies in support for stated conclusions.</td>
<td>θ Sound conclusions reached based on achieved results.</td>
<td>θ Insightful, supported conclusions and recommendations.</td>
<td></td>
</tr>
<tr>
<td><strong>OVERALL PERFORMANCE</strong></td>
<td>θ Unacceptable</td>
<td>θ Marginal</td>
<td>θ Acceptable</td>
<td>θ Exceptional</td>
<td>TOTAL 105</td>
</tr>
<tr>
<td>POINTS REQUIRED</td>
<td>0–9</td>
<td>10–19</td>
<td>20–29</td>
<td>30–39</td>
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<td></td>
<td>106</td>
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</tr>
</tbody>
</table>
## SLA Survey Group Project Assessment Rubric

<table>
<thead>
<tr>
<th>Topic</th>
<th>Survey Design</th>
<th>Survey Administration &amp; Results</th>
<th>Survey Report</th>
<th>Written Format and Style</th>
<th>Group Participation Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>225-200 Exceptional</td>
<td>The topic has an exceptionally clear focus, demonstrates a profound understanding of concept, and is one and only one topic.</td>
<td>The survey design has exceptional face validity. The questions are extremely concise, relevant, and intelligible. The survey allows for data which will reveal profound insight into topic.</td>
<td>The survey was exceptionally well administered. Results reveal important and profound details extremely applicable to the topic under investigation.</td>
<td>The survey report was exceptionally clear, understandable, relevant to topic, shows outstanding connections and insight into the topic under investigation, and always uses correct terminology.</td>
<td>The group participation report was exceptionally concise &amp; brief; it demonstrates group participation at each stage (in an honest and exceptional manner).</td>
</tr>
<tr>
<td>199-175 Above Average</td>
<td>The topic has an above average clear focus, successfully demonstrates an understanding of concept, and is one and only one topic.</td>
<td>The survey design has above average face validity. The above average questions are highly concise, relevant, and intelligible. The survey allows for data which will reveal above average insight into topic.</td>
<td>The survey was significantly well administered. Results reveal significantly important details highly applicable to the topic under investigation.</td>
<td>The survey report was highly clear, understandable, relevant to topic, shows above average connections and insight into the topic under investigation, and usually uses correct terminology.</td>
<td>The group participation report was above average in terms of being concise and brief. It demonstrates group participation at each stage (in an honest and above average manner).</td>
</tr>
<tr>
<td>174-150 Average</td>
<td>The topic has an average clear focus, demonstrates an average understanding of concept, and is one and only one topic.</td>
<td>The survey design has average face validity. The average questions are relatively concise, relevant, and intelligible. The survey allows for data which will reveal average insight into topic.</td>
<td>The survey was well administered. Results reveal some important details applicable to the topic under investigation.</td>
<td>The survey report had average clarity, understandability, relevancy to topic, shows average connections and insight into the topic under investigation, and often uses correct terminology.</td>
<td>The group participation report was average in terms of being concise and brief. It demonstrates group participation at each stage (in an honest and average manner).</td>
</tr>
<tr>
<td>149-125 Adequate</td>
<td>The topic has an adequately clear focus, demonstrates an adequate understanding of concept, and is one and only one topic.</td>
<td>The survey design has adequate face validity. The adequate questions are somewhat concise, relevant, and intelligible. The survey allows for data which will reveal adequate insight into topic.</td>
<td>The survey was sufficiently well administered. Results reveal a couple important details slightly applicable to the topic under investigation.</td>
<td>The survey report was adequately clear, understandable, relevant to topic, shows adequate connections and insight into the topic under investigation, and sometimes uses correct terminology.</td>
<td>The group participation report was adequate in terms of being concise and brief. It demonstrates group participation at each stage (in an honest and adequate manner).</td>
</tr>
<tr>
<td>124-100 Fair</td>
<td>The topic has a fairly clear focus, demonstrates a fair understanding of concept, and is one and only one topic.</td>
<td>The survey design has fair face validity. The questions are fairly concise, relevant, and intelligible. The survey allows for data which will reveal fair insight into topic.</td>
<td>The survey was fairly well administered. Results reveal fairly important details fairly applicable to the topic under investigation.</td>
<td>The survey report was fairly clear, understandable, relevant to topic, shows fair connections and insight into the topic under investigation, and infrequently uses correct terminology.</td>
<td>The group participation report was fair in terms of being concise and fair. It demonstrates group participation at each stage (in an honest and fair manner).</td>
</tr>
<tr>
<td>99-75 Sorely Lacking</td>
<td>The topic has an unclear focus, demonstrates an poor understanding of concept, and/or has multiple topics.</td>
<td>The survey design is slightly lacking in face validity. The questions are slightly inconcise, irrelevant, and/or unintelligible. The survey allows for data which will barely reveal insight into topic.</td>
<td>The survey was barely well administered. Results reveal slight details barely applicable to the topic under investigation.</td>
<td>The survey report was slightly lacking in clarity, understandability, relevancy to topic, lacking some connections and insight into the topic under investigation, and rarely uses correct terminology.</td>
<td>The group participation report was slightly lacking in terms of being concise and brief. It slightly demonstrates group participation at each stage (in an honest manner).</td>
</tr>
<tr>
<td>74-below Completely unsatisfactory</td>
<td>The topic has a very unclear focus, demonstrates an unsatisfactory understanding of concept, and/or has multiple topics.</td>
<td>The survey design does not have face validity. The questions are inconcise, irrelevant, and/or unintelligible. The survey allows for data which will not reveal insight into topic.</td>
<td>The survey was not well administered. Results do not reveal details applicable to the topic under investigation.</td>
<td>The survey report was not clear, understandable, relevant to topic, does not shows connections and insight into the topic under investigation, and does not use correct terminology.</td>
<td>The group participation report was not concise and brief. It did not demonstrate group participation at each stage (in an honest manner).</td>
</tr>
</tbody>
</table>
Research has shown that students can greatly improve their written and oral communication if their instruction is “scaffolded” and they receive feedback on their work along the way. Scaffolding assignments means starting students with simpler, more self-contained tasks and then moving to more complex, difficult challenges. Mastery of the simpler tasks becomes the scaffold for success in the more challenging work.

Scaffolding works well in communication instruction because novice and presenters can’t work on improving all of their communication skills at once. This is especially true if English is not their main language. Moreover, many people are nervous about writing or presenting, so simpler assignments and earlier feedback can help them overcome anxiety, develop confidence and avoid writer’s block.

Here are some tips for helping students give and receive useful feedback on their speaking and writing.

1. **Start by having students give each other feedback on short oral and written assignments in an informal setting.** For example, early in the research process, ask students to present their research question(s) to the group for feedback.
   - Have the presenter stand up and face the group to present his or her question.
   - Guide the respondents into giving positive but constructive feedback. Referring to what they’ve learned about research questions, ask if this one is clear? specific? important? What do people like about the questions? What else would they like to know?
   - For writing, try a “write to learn” exercise. Ask students to write something they will need for their proposal, such as a paragraph about their experience and readiness to take on their proposed project. Then have students exchange these with each other to talk informally about whether each student’s paragraph is convincing. Ask for one to two volunteers to read an effective paragraph out loud.

2. **For written drafts, have students give feedback in stages, responding first to content and organization and only later giving advice about style and mechanics.**
   - Use the “Round 1” and “Round 2” peer feedback sheets, which reflect the proposal template and are designed to observe this distinction.
   - Have students work with hard copies of the drafts so that they can fill out the worksheets but also comment directly on the drafts. Readers read e-documents and hard copies a little differently, and writers should always read their own documents both ways.
   - Remind students to prioritize their comments. They should tell the writer what one or two things are the most important to consider as they revise.
Tips for facilitators about peer feedback

Page 2

- For feedback on style and mechanics, remind students not to suggest changes simply because they would write something differently or prefer a different phrasing. They should have a rationale for the changes they suggest, for example, noting that making certain sentences shorter will make them more readable or that defining technical terms will help non-technical readers understand the proposals. When peer reviewers “correct mistakes,” they should be sure that they’re giving correct advice; if they’re not sure, they should ask, or tell the writer to check a grammar and usage handbook.

- Bring a grammar and usage handbook to the workshop on the days when students will be peer reviewing for style and mechanics.

- Remind peer reviewers that they don’t have to completely edit someone else’s proposal. Their main job is to identify patterns of problems, such as comma errors, wordy sentences, or missing articles. It is the writer’s job to make corrections. If a writer wants help with proofreading, he or she should say that; proofreading is different from peer reviewing.

- Encourage writers to follow up on peer review by taking their draft proposals to the Writing Place.

3. For practice presentations, have students work with a presentation checklist.

- Discuss the items listed on the checklist with the group.

- Have students practice by presenting just a part of their presentation for feedback. This will allow time for discussion. Explain that everyone will benefit from the feedback given to each presenter.

- Remind speakers of the importance of facing their audience. If they have to look at a slide or draw a figure on the board, they should stop talking, do that, and then look at the audience and continue.

- Insist that students begin their feedback with positive comments. Speakers are often so nervous that they overlook their strengths – good volume, a good pace, a friendly smile, etc.

- Don’t let anyone give feedback if they won’t be presenting. When people aren’t going to be presenters, it’s too easy for them to be critical and negative.

- Tell students to go home and practice, practice, practice! It’s often effective to practice in front of a mirror.
Today, you are going to get two other folks to read your piece, and they are going to answer two of your questions, along with three other set questions.

Set Questions
(Make sure to respond fully, in at least three sentences, to each question)

1. What are two things that I seem to have going for my research right now?

2. What are two questions you have about my thesis or research question?

3. What are some possible sources, or source of sources, that I might use?
Writer's Questions
(Make sure to respond fully, in at least three sentences, to each question)

1. First Question by the writer.

2. Second Question by the writer.

If you get done ahead of everyone else, then begin revising your work or go online and continue to do further research with the online databases, located at http://www.library.ucsb.edu/eresources/databases/data-frames.html.
Guidelines for Peer Critique

1. Is the table in Excel format and does it clearly identify the demographic, health, and economic data of importance to the community?

2. What data sources have been used? How are they appropriate for the community being assessed?

3. Add any suggestions you may have for additional data resources that may be helpful.

4. What are the strengths and weakness of the rationale for the Health Indicator that has been selected?

5. How are the data trends identified in the table reflected in the rationale?

Student providing the critique: ____________________________

Student work being critiqued: ____________________________
CIPD Resources
Contact information
Accessing CIPD’s E-Reserve

CIPD has a large selection of articles and resources on teaching and learning available for you through our permanent electronic reserve list.

To access this list from campus:

- Select Libraries from the UWM home page
- Select Reserve and Electronic Reserve
- Under Dept. select UWM-CIPD: UWM Ctr. For Instructional and Prof. Devl.
- Select CIPD electronic reserve readings (Schroeder)
- Select Link to electronic reserve readings

To access this list from off-campus on UWM Electronic reserve, use:

ID: eres

Password: fall (changes w/season) and follow the above steps.
*Use Winterim when fall semester changes.