

ENGINEERING APPROACH TO WRITING: A PILOT PROGRAM FOR CIVIL ENGINEERING GRADUATE STUDENTS

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Engineering Education Standards

-  Both American Society of Civil Engineers (ASCE) Body of Knowledge II (BoK) and ABET stress the importance of both technical engineering skills and communication skills and the importance of preparing students for professional practice.
-  American Society of Civil Engineers. (2008). Outcome 16: Communication. *Civil Engineering Body of Knowledge for the 21st Century: Preparing the Civil Engineer for the Future*, 2nd ed. <http://www.asce.org/Content.aspx?id=2147486178> (accessed September 28, 2010).
-  Accreditation Board for Engineering and Technology. (2008). *Criteria for Accrediting Engineering programs: Effective for Evaluations During the 2009-2010 Accreditation Cycle*. <http://www.abet.org/forms.shtml> (accessed October 8, 2010).



Our Response to the Challenge



Writing Support Program!

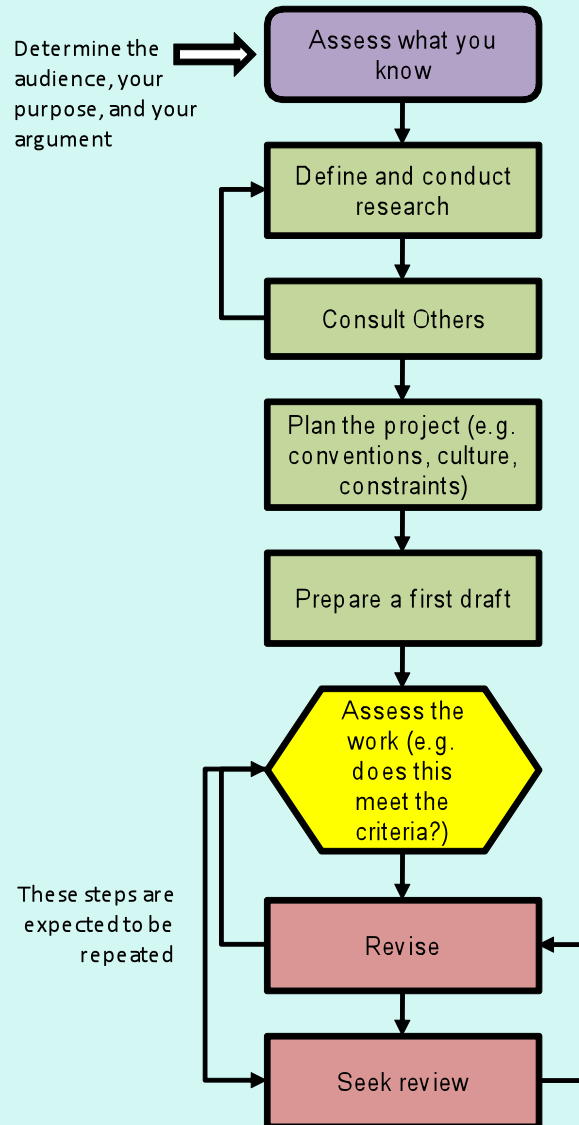


Technical writing expert, faculty, InTrans/
CCEE leadership – get organized.

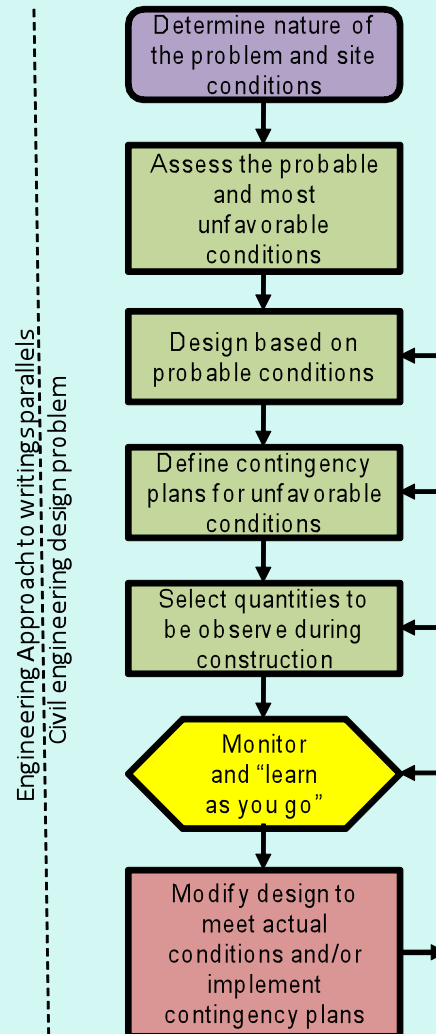
A vertical bar on the left side of the slide, consisting of several colored segments: a small pink square at the top, a grey square, a yellow square, and a long pink rectangle at the bottom.

Our parallel model

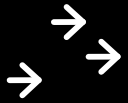
Solving a civil engineering writing problem:
A recursive process



Solving a civil engineering problem:
The Observational Method (Geotechnics)*




*The Observational Method in geotechnical engineering is a continuous, managed, integrated, process of design, construction control, monitoring and review that enables previously defined modifications to be incorporated during or after construction as appropriate. CIRIA 185 (1999)



What we did

Writing Program:

 First, our approach defines communication broadly, and

 Second, our approach intends to prepare graduates by equipping them with habits, tools, and strategies they can use immediately in professional practice.

Sample products/processes

Tool/Process	Original product	Adapted material*	Process
Thesis Outline	X		
Record of Decisions	X		X
Electronic feedback system	X		
Research Proposal Template	X		
One-on-one writing coaching	X		X
Progress Tracking Form	X		X
Problem Statement Worksheet	X		
The Differences Between Goals and Objectives (handout)		X	
Writing Effective Figure and Table Captions (handout)	X		
Coherence and Cohesion (handout)	X	X	
About Writing a Thesis	X		X
Category Matrix for Comments Intended to Guide Revision	X		X
Structured Peer Review			X
Preparing an Annotated Bibliography	X		
Matrix for Deciding Authorship on Collaborative Works	X		X
Syntax (handout)		X	
Verb Issues for ESL Writers (handout)		X	
ASCE Writing Guidelines		X	
ASCE Quick Guide to Common Types of Referenced Material		X	
Online Search Engines/Libraries for Geotechnical Publications		X	
Strategies for Simplicity (handout)		X	
Purdue University Writing Lab Workshop Series for the Indiana DOT		X	
<i>Chicago Manual of Style</i> , Proofreaders' Marks (handout)		X	
TRB Information for Authors		X	
Writing a Paper for the <i>Transportation Research Record</i>		X	
Transportation Research Board Reviewer Instructions		X	

*Information for these resources is available on request.

Example thesis outline

ABSTRACT

CHAPTER 1. INTRODUCTION

Industry Problem

 Industry concerns

 Impact on industry

Technical Problem

Goal of the Research

Objectives

Significance of the Research

Organization of the Document

CHAPTER 2. BACKGROUND/ LITERATURE REVIEW

Relevant Research and Literature

 Major contributions to the field

 Present practices/current fieldwork

Preliminary Work

Context for this Project

CHAPTER 3. METHODS

Research Design

Objective 1

 Task 1 associated with objective 1

 Task 2 associated with objective 1

CHAPTER 4. MATERIALS

Material A

 Laboratory test results

 Field test results

CHAPTER 5. RESULTS AND DISCUSSION

Objective 1

 Major point 1

 Major point 2

CHAPTER 6. CONCLUSIONS

Objective 1

General Conclusions

CHAPTER 7. RECOMMENDATIONS

Immediate Impact

Long-term Impact

Implications for the Future

Sample text methods chapter

CHAPTER 3. METHODS

The purpose of this chapter is to describe the methods used in the study.

Describe the contents and organization of the chapter. Your subsequent first-level headings should match your description of the chapter. For example:

The methods (e.g., specific tests or activities) used in this study were selected to address these objectives: <to verb objective 1>; <to verb objective 2>; and <to verb objective 3>.

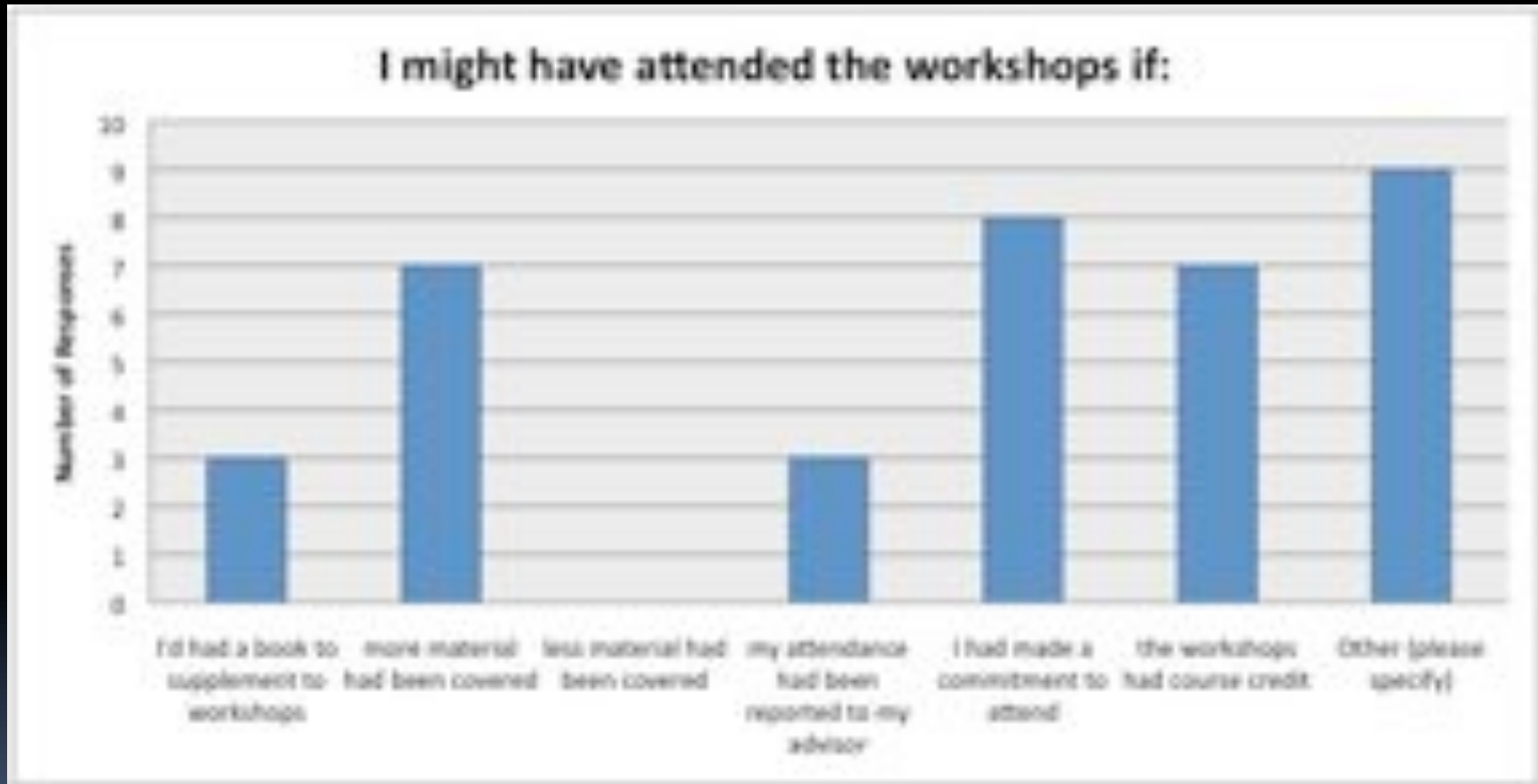
Provide a brief overview that explains why you chose this approach and include some background that led you to conduct your research in this way. For example:

This chapter describes the research design and the research tasks in the context of the objectives.

What we learned

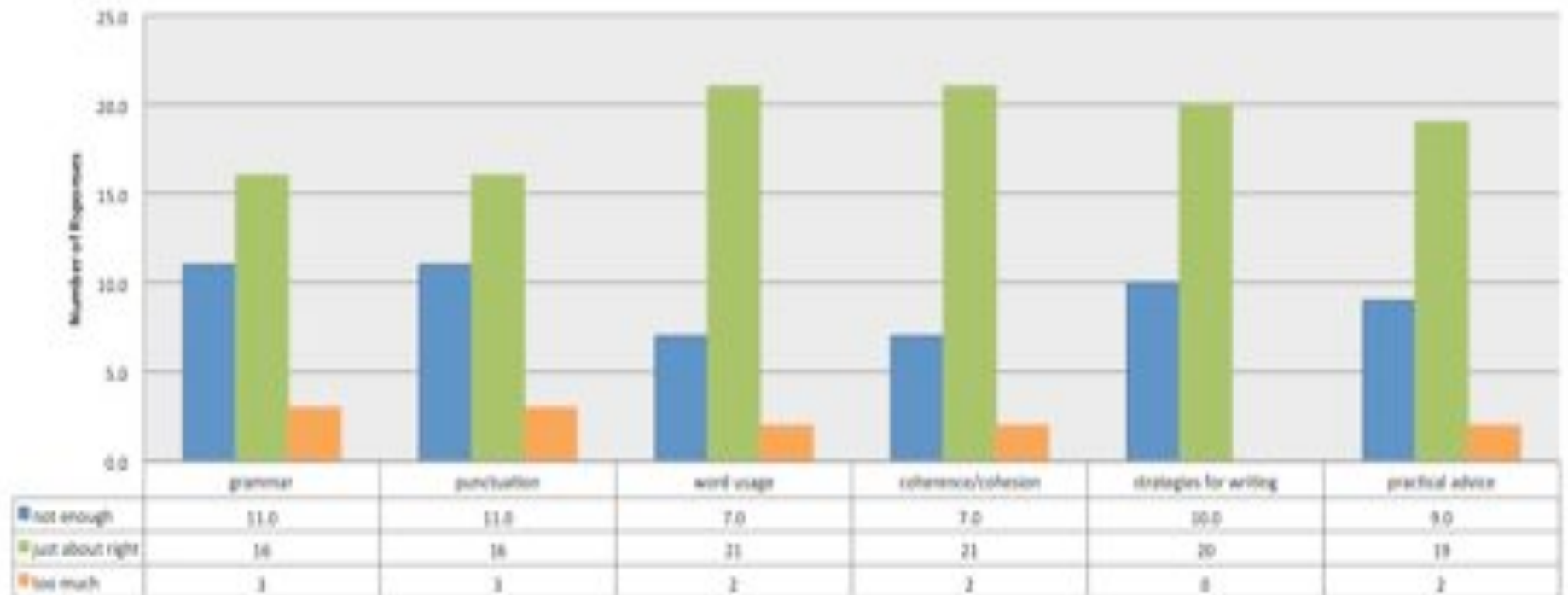


What we learned



What we learned


Material Covered in Workshops





Research Recommendations and Plans for Future Development

Although we believe that one-on-one writing coaching is the most effective means of helping students improve their writing skills, we recognize that it is probably unrealistic to fund—and it would not be easy to provide—such efforts on a larger scale.




As such, we sought to translate program materials and integrate them into a workshop or course format.



Research Recommendations and Plans for Future Development

One of the challenges that remains involves convincing advisors that it is in their best interest to set aside resources, both financial and human capital, to help graduate students improve their writing skills. Why?



Students' communication skills will improve and their work in graduate school will more accurately reflect their abilities. As such, faculty mentors will benefit because, as they will no longer have to focus on local, mechanical distractions, they can focus instead on technical matters. Research sponsors will benefit from clear, concise reports.



Research Recommendations and Plans for Future Development

Lastly....., the students will be better equipped with practical/professional/soft skills and their proven abilities and subsequent success will enhance the legacy of their universities. Finally, well-trained technical professionals who can communicate effectively will be valuable employees from day one.



Thank you

djwhite@iastate.edu (feedback and idea exchange)