WPI Project Based Learning Institute (22 June 2018)-

Rob Traver, Workshop Leader

Theme: Writing as Performance (writing is public and can be coached)

Means (Models & Rubrics, Practice, Feedback). Characteristics (Explicit, Iterative, Less-is-more)

Activity/Example: Values, Models, Practice, Feedback, Assessment Worksheet

Resource: Eberly Center (CMU)

Resource: Response to Student Writing: 13 Ways of Looking at It—Doug Hess

Activity/Example: Responding to Student Writing—Ryan Madan and student rewrite


Example: Student Authorship Page

Activity: Welcome to Purdue OWL—Paramedic Method: A Lesson in Writing Concisely

Example: First-year writing examples, instructor feedback (better and worse), revisions.

Activity: Writing for Flow

Resource: Give your students better writing feedback: A practical guide for instructors (www.betterwritingfeedback.com)

Resource: Improving Student Writing: Using Feedback as a Teaching Tool

Resource: Providing Feedback on ESL Students’ Written Assignments

Activity: Making Feedback Explicit

Activity—Public Feedback Review

Resource: The Power of Peers—Traver

Example: Request for peer reader.

Example: Assignments from “Feed the World” for Project Based Learning in the First Year—WPI (Traver & Wobbe) and a student example

Example: A little student feedback on writing instruction in a project preparation course in the 3rd year

Resource: AAC&U Written Evaluation VALUE Rubric

Resource: GPS Writing Rubric (First-year)


Activity: What I’m thinking about so far?

Example: Instructor’s Notes—Traver
Values, Models, Practice, Feedback Worksheet

Values. What do I value in student writing? What is not so important? What is the relation between “audience” and my values for student writing?

Models (and examples). What models of writing do I have that I will share with students? Are models only exemplary? Do I have different levels of writing to share? Are these models consistent with my writing values?

Practice. Where in my curriculum or program do students practice writing? How do I explain the need to practice writing? Is the practice aligned with the models and values?
**Feedback.** What examples of feedback do I have? What kind of feedback do I provide? What are my feedback principles? Will I use peer feedback? Will I use feedback from another professional? Is this feedback consistent with the values I express?

**Assessment.** How will I assess my “writing” initiatives? What information will I seek? How will I get it? From whom? When?
How can I help students become better writers in the discipline when I am not a writing teacher?

There are a variety of things you can do that do not require expertise as a writing teacher, as well as ways of creating assignments and assessments that will aid students in this academic endeavor.

Share Useful Strategies with Students.

Many of the writing strategies we take for granted (e.g., how to write an introduction, how to research relevant sources) are not at all obvious to our students. And yet, these issues arise so frequently that there are resources available for us to share with our students. For example, the library offers workshops on various topics such as conducting literature searches and evaluating sources that can be scheduled during class time so students all get the chance to learn these basic skills before they need to be applied in writing assignments. In addition, there are several sources of information on the web that we can share with our students on basic writing tips and strategies:

- For general advice on the various steps in writing a term paper, see Princeton University's Writing Center.
- For strategies in writing introductions and conclusions, see MIT's Writing Center.
- For a checklist to help students edit their own writing for grammatical errors, see University of Wisconsin at Madison.

Provide Examples.

Use examples of good student writing to discuss with your students what makes these pieces of writing effective. This helps students identify the elements of good work for particular assignments within particular disciplinary domains that, in turn, helps them become conscious of these elements in their own work. Diverse models of student work also illustrate that there are different ways to approach the same assignment, thus offering students some sense of creative scope.

Model Your Process.

It may also be helpful for you to share with students your process in approaching writing tasks. For example, you can tell students:

- What questions you ask yourself before you begin (you might, for example, ask: Who is my audience? What am I trying to convince them of? What do I want to say, and what evidence can I use to back it up?).
- How you go about writing (Do you sketch out ideas on scrap paper? Write an outline? Hold off on writing your introductory paragraph until you have written the body of the paper?).
- How you go about diagnosing problems and making revisions in your writing (pdf). (Do you ask a friend to read and comment on your work? Do you step away from the paper for a day and return to it with fresh eyes?).

This is not always easy: it means we must become aware of and then make explicit the processes we engage in unconsciously and automatically. However, illuminating the complex steps involved in writing and revising to both you and your students is a useful exercise.

Design Assignments that Offer Appropriate Practice with Feedback.

Of course, one of the best ways for students to become better writers is through practice. However, as our learning principle on practice and feedback shows, not all practice is equally effective. An important way to help students develop as writers, even in a course not solely designed for this purpose, is to match the writing assignments to the students' skill level and offer practice (with feedback) on the aspects of writing where they can benefit. See more information on designing effective writing assignments and on responding to student writing.

Embed Milestones.

It is also helpful to include milestones into an assignment so that students submit either preliminary drafts (so they can incorporate feedback in their subsequent revisions) or components of a larger paper (so they avoid leaving the entire assignment to the last minute). For example, you could require your students to read and comment on at least two other classmates' early drafts by a specific deadline (for information on peer review, see the University of Wisconsin's Writing Center).

Require Drafts.

It is widely held that good writing is one draft. For most people, good writing requires
rereading, rereading, and sometimes fairly extensive revising. Many students, however, misconstrue or underestimate what good writing involves, believing that it's a simple linear process when, in fact, it is complex and iterative. Many students leave writing assignments to the last minute, expecting to be able to sit down and rapidly turn out a good paper. Thus, they may not give themselves enough time to re-examine premises, adjust the organizational scheme, refine their arguments, etc. Requiring drafts forces students to build in appropriate time frames for their work.

Create Rubrics.

A detailed scoring guide or performance rubric helps students to recognize the component parts of a writing task and understand how their competence will be assessed in each of these areas. A good rubric helps students to see what comprises high quality writing and to identify the skills they will need to perform well. You might want to provide your rubric to students along with the assignment so they know what the criteria are in advance and can plan appropriately.

Recognize Cultural Differences.

Besides the differences between skilled and unskilled writers, there are cultural differences that often manifest themselves in the written work of non-native speakers of English. For example, Arabic speakers may develop their arguments by restating their position rather than stating rationales. Japanese speakers are inclined to argue both for and against an issue, and to be more tentative in their conclusions. Some non-native speakers generally provide lengthier treatments of historical context, minimizing their own arguments. For more information about this area, contact the Intercultural Communications Center’s Writing Clinic for non-native English speakers.

Be explicit with students about the behaviors of skilled writers.

Understanding the behavioral differences between skilled and unskilled writers can help us work more effectively with students, even to “warn” them in advance of potential pitfalls to be avoided.

Skilled/successful writers

Unskilled/unsuccessful writers

Conceive the writing problem in its complexity, including issues of audience, purpose, and context.

Conceive the writing problem narrowly, primarily in terms of topic.

Shape writing to the needs of the audience.

Have little concept of audience.

Are committed to the writing.

Care little about the writing.

Are less easily satisfied with first drafts. Think of revision as finding the line of argument. Revise extensively at the level of structure and content.

Are more easily satisfied with the first draft.

Think of revision as changing words or crossing out and throwing away. Revise only at the level of single word or sentence.

Are able to pay selective attention to various aspects of the writing task, depending on the stage of the writing process.

Often tried to do everything perfectly on the first draft. Get stuck on single word choices or on punctuation, even at early stages. Tend to believe that writing well is a gift you either have or don’t have.

Sharing this information with students in advance of writing assignments can aid them in the writing process.
Response to Student Writing: 13 Ways of Looking at It*

Doug Hesse
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1. No professor is capable of making comments so profoundly wonderful that a student will become a perfect writer on the basis of remarks on a single paper.

2. Unskilled writers are largely unable to assign levels of importance to comments made on their papers. In other words, they are likely to treat equally a comment that the argument of an essay is confusing and a comment that the essay contains several misspellings. Moreover, since comments on surface errors are more easily addressable (though error types themselves are not necessarily easily and permanently resolved), students are likely to attend to them and not to more serious problems in logic, idea development, focus, or order.

3. Teachers have a finite amount of time to spend responding to writing. There is evidence that time spent meticulously annotating every aspect of a student's paper does little good. This is especially true if the comments are rubber stamp ones: "awkward," "be specific" and so on.

4. Students learn to write by writing, and while judicious advice is helpful, there is a gap between knowledge and performance. A steady diet of being closely edited doesn't mean that a student will necessarily internalize what he or she needs to do in future tasks.

5. Set ground rules for yourself, and clearly convey to students what they can and cannot expect in terms of your response. For example, tell them (or include a response sheet that tells them) that your written comments will address only one main strength and one main area for improvement, if that's what you choose to do. Cover other aspects of the paper with a response or grading rubric. 1. "The most effective aspect of this paper is ___" (or, "The best section of this paper is on page ___") 2. "The one thing that would most improve this paper or ones like it in the future is ___"

6. "Edit" only a fraction of a paper: a selected paragraph or page. Make clear up front that you do not aspire to be exhaustive. See recommendation 3.

7. Make good student papers available to illustrate features of strong work.

8. Develop a response rubric, that is, a list of elements of the paper, with values you can check off. Typical broad criteria include: focus, thesis, argument; organization; clarity of development; quality and quantity of evidence or support; ambition (degree of difficulty); format; correctness; and style. However, each element may look different in different situations. Use general rubrics to develop ones tailored to specific assignments.

9. As you write assignments, consider how you might respond to the kinds of writing those assignments might yield. It doesn't "cheapen" the assignment to reveal criteria to students up front. You might provide more scaffolding to students at the beginning of the semester.

10. Require students to tell you the specific aspect of the paper on which they'd most like to get feedback from you, then reserve most of your comments for that aspect. You might want to give them a menu of features to select from or, at least, explain to them why very general requests won't yield them much help (e.g. "Does it flow?

11. Have students write a cover memo in which they describe their strategies in writing the paper and what they perceive its strengths and problem areas to be.

12. Use brief marginal comments to call attention to "higher order" aspects in the paper, usually content or development. A "good" or a "yes" or a "?" or an "evidence?" go a long way. Use squiggly lines (or what you will) to call attention to sentence errors or hugely rough spots (but remember that your goal should be to teach). Don't feel compelled to mark everything, and certainly don't edit everything.

13. In courses with multiple assignments give students "vouchers" good for one detailed commentary per term. They should reserve that for the time they want you to read a paper as you would a manuscript submitted to a journal.

*Apologies, Mr. Stevens.
IJP: Creating a Fire Inspection Program

4.0 Results: Necessary steps for an inspection program to be effective and sustainable:
   4.1 Revamp organizational structure.
   4.2 Create education programs.
   4.3 Change record keeping practices.

4.2 Education of the Fire Prevention Personnel and Costa Rican Citizens:

By studying the educational systems utilized in developed programs and within the Cuerpo de Bomberos, we arrived at three findings that were further supported by our surveys of Costa Rican citizens:

1. The prevention staff of developed regulatory inspection programs have standardized training.
2. The training program of the Engineering Department of the Cuerpo de Bomberos Costa Rica is not standardized.
3. Educating the public is important to maintain sustainability and support for Regulatory inspections.
4.2.3 Educating the public is important to maintain sustainability and support for Regulatory inspections.

When mandating inspections, the fire inspectors will be asking citizens to comply with procedures they may not even be familiar with. If the citizens have no knowledge of fire safety and prevention, asking them to comply is asinine. Just as the fire personnel are being trained to enforce, the citizens need to be equipped with the knowledge to meet compliance. We found that public education should be targeted towards children and adults, as the way they are being educated will be different.

Children are the generation that will grow up to change the thought process behind fire safety. Kids as young as 3, are able to retain material through repetition and instruction. An example of how the children of Costa Rica can impact the entire society is a recycling initiative put in place last year. This recycling initiative was first taught in the schools to the children who then went home to change their families. In an interview with Juan, we found that the recycling program has had great success utilizing children to make the change. He forecasts a similar success if fire education is taught to the children first. The NFPA provides materials written in Spanish to teach drills to school children. Developed by the NFPA and National Association of Hispanic Firefighters, an example of a teaching tool is the Learn Not to Burn preschool program that comes with songs and teacher guides. As we learned from an inspection shadowing at a daycare some of their biggest worries are how to get the kids out. The inspectors gave some strategies but these tools may help schools teach fire safety on their own.

Publicly educating adults through their children or other forms of instruction can help to instruct them on how to make fire safe changes to meet compliance. To teach the adults, the NFPA taught us to take into consideration the fact that adults are busy and want information they are taught to be worth their time and attention. They want to see explanations for why they need something and would rather do an activity explaining it then to be talked to. For this reason we may find it more useful to have education of business owners done on site while performing an inspection. This would put fire safety in the perspective of the owner's own personal building while teaching them the importance of fire safety. They also want motivation to do these fixes, which that can come from feeling safer but also may come from incentives that we talk further about in legislation.
IQP: Creating a Fire Inspection Program

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Publicly educating adults through their children or other forms of instruction can help to instruct them on how to make fire safe changes to meet compliance. To reach the adults, the NFPA taught us to take into consideration the fact that adults are busy and want information they are taught to be worth their time and attention. They want to see explanations for why they need something and would rather do an activity explaining it than be talked to. For this reason we may find it more useful to have education of business owners done on site while performing an inspection. This would put fire safety in the perspective of the owner's own personal building while teaching them the importance of fire safety. They also want motivation to do these fixes, which can come from feeling safer but also may come from incentives that we talk further about in legislation.
Haley Griffin

11 AM

Responding to Student Writing

Fire inspectors will mandate inspections and ask citizens to comply with unfamiliar procedures. This seems astonishing because some citizens have no knowledge of fire safety and prevention. The fire personnel must equip the citizens with the knowledge to meet compliance. Public education should target children and adults differently.

Children have the ability to change the thought process behind fire safety. Kids are able to retain material through repetition and instruction. The children of Costa Rica impacted their society through a recycling initiative established last year. The recycling initiative was first taught to children at schools. The children then taught it to their families at home. An interview with Juan informed us of the great success the program has had. Children played a key role to help make the change. Juan forecasts a similar success if children are taught fire education before adults. The NFPA provides materials written in Spanish to teach drills to school children. The Learn Not to Burn preschool program was developed by the NFPA and the National Association of Hispanic Firefighters. This teaching tool comes with songs and teacher guides. Shadowing at a daycare informed us that a major concern remains: how to get the children out. The inspectors offered some strategies. These tools may help schools teach fire safety on their own.

Publicly educating adults through their children or other instruction can help them make fire safety changes to meet compliance. The NFPA suggested consideration of adults' busy lives. Adults prefer information on why they need something and explanations through activity. It may be more useful to educate business owners during inspections on site. This would teach the
owner the importance of fire safety through the perspective of their own building. Safety purposes can motivate change in fire safety.

Haley, these revisions are fine and retain a significant amount of the original material.

2/10

75/100
Chapter 1: Focus of Book
- Role of writing in effective team work
- How to write internal team documents (essential to well run projects)
  - Schedules, meeting minutes, team agendas, memos, emails, etc.
- How to write and revise large documents as a group
- Collaboration Methods:
  - Face to face: entire team sits down together and writes
  - Divided: group breaks document into sections and assigns each member a section
  - Layered: each person is assigned 1+ specific roles. Each works on the document in turn, adding their expertise, revising and improving upon what exists.

Chapter 2: Project Management
- Lists duties of the project manager
  - Examples:
    - keeps meeting minutes for accountability and consensus
    - keeps a meeting agenda to keep discussions on track
    - sends reminders and notifications
- Straw Document:
  - Rough skeleton of project
  - Each person works on, then group cuts and puts collaborative skeleton together
  - Or team manager can do the first draft and then all work on

Chapter 3: Team Charter
Team Charter

Broad Team Goals
1. Clearly communicate the “bottom line” meaning of our results throughout the report.
2. Impress the instructor with the amount of effort we have put into collecting and analyzing our data.

Measurable Team Goals
1. Meet all six of the evaluation criteria listed on the assignment sheet.
2. Meet or beat all deadlines.
3. Obtain data from at least 15 users.
4. Follow all eight guidelines for tables and figures listed in the instructor’s PowerPoint presentation.

Personal Goals
- Aaron: Improve management and teamwork skills.
- Bryan: Improve writing skills (i.e., less wordy).
- Yolanda: Improve writing skills (improve organization and grammar).
- Mandy: Improve technology skills (especially PowerPoint) and teamwork skills.

Individual Commitment
- Aaron, Yolanda, and Mandy are all willing to put in 100 percent effort.
- Bryan would like to put in 100 percent effort but doesn’t know whether his job will allow him to commit that much time. He is willing to accept a slightly lower grade if it turns out he cannot keep up.

Other Concerns
- Yolanda is worried that her grammar skills may need a lot of work.
- Mandy has done only one PowerPoint presentation before but really wants to improve her tech skills and will work hard to learn.
- Aaron is usually unable to check his e-mail in the evenings and during weekends but will try to check at least twice every school day.
- Bryan is just worried about his job interfering.

Conflict Resolution
If we experience conflict that is not resolved after 30 minutes of respectful discussion of the points, we will present both sides to the instructor and ask him to decide.

Missed Deadlines
If a team member misses a deadline, the project manager will send a “gentle reminder” e-mail. If that team member does not respond within 24 hours, the project manager will contact the instructor, describing the problem. If there is some extenuating circumstance (e.g., personal emergency), the project manager will contact the rest of the team for input on how to proceed.

Unacceptable Work
If a team member turns in work that is clearly unacceptable (e.g., leaves out important information; has major errors; does not meet the assignment criteria; clearly does not meet the team goals of emphasizing the bottom line throughout), other team members should report their concerns to the project manager. The project manager will then contact that team member with a list of concerns and suggest a deadline (usually 48 hours) for when a revised copy of the work is due. If that team member is confused about why the work is unacceptable, that person should seek assistance and e-mail the project manager explaining his or her progress. We want to note that there is no shame in seeking outside assistance!

FIGURE 3.2. Team Charter
### TASK SCHEDULE

Amy is the group writing expert. Steven is the group technology expert.

<table>
<thead>
<tr>
<th>Deadline</th>
<th>Task</th>
<th>Assigned to</th>
<th>Contribution value</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/4</td>
<td>Write topic proposal</td>
<td>Amy</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ongoing</td>
<td>Maintain task list and minutes</td>
<td>Amy</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>9/13</td>
<td>Collect data</td>
<td>Steven</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>9/14</td>
<td>Enter data and perform initial analysis</td>
<td>Steven</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>9/20</td>
<td>Write introduction</td>
<td>Luke</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>9/20</td>
<td>Write methods</td>
<td>Steven</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>9/20</td>
<td>Write results (with basic graphs)</td>
<td>Luke</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>9/20</td>
<td>Write discussion</td>
<td>Luke</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>9/22</td>
<td>Suggest revisions (detailed)</td>
<td>Amy</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>9/22</td>
<td>Suggest revisions (global issues only)</td>
<td>Steven</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>9/28</td>
<td>Implement revisions</td>
<td>Luke</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>ongoing</td>
<td>Help Luke format final graphs in Excel</td>
<td>Steven</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10/1</td>
<td>Write abstract for report</td>
<td>Steven</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10/1</td>
<td>Make final edits to report</td>
<td>Amy</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10/3</td>
<td>Create presentation</td>
<td>Amy</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ongoing</td>
<td>Help Amy with presentation</td>
<td>Steven</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10/4</td>
<td>Suggest revisions to presentation</td>
<td>Luke</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10/4</td>
<td>Suggest revisions to presentation</td>
<td>Steven</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10/6</td>
<td>Revise and deliver presentation</td>
<td>Amy</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Team member: Amy**  
Total contribution: 19

**Team member: Steven**  
Total contribution: 18

**Team member: Luke**  
Total contribution: 18

**FIGURE 4.2: Task Schedule**

The project manager typically prepares the first draft of the task schedule, assigning names and dates to each task. The team then revises the schedule as needed and collaborates to assign contribution values from 1 to 5 for each task. The task schedule offers several opportunities for team members to comment on and revise one another's work. The Status column is for recording when tasks are completed.
Chapter 5: Constructive Conflict
- Five key strategies to lay groundwork for constructive conflict
- Constructive vs. Deconstructive Feedback

<table>
<thead>
<tr>
<th>Constructive Conflict</th>
<th>Destructive Conflict</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presenting evidence and reasons in support of ideas</td>
<td>Making emotional arguments; insisting that others should listen to you because of your experience or credentials</td>
</tr>
<tr>
<td>Accepting questions and criticisms of your ideas as good for the group</td>
<td>Treating questions and criticisms as personal attacks</td>
</tr>
<tr>
<td>Listening closely to others' viewpoints</td>
<td>Rejecting others' viewpoints before you fully understand their position</td>
</tr>
<tr>
<td>Asking others to present evidence supporting their positions so that you can make a reasoned decision</td>
<td>Mocking or ridiculing others' positions</td>
</tr>
<tr>
<td>Building on others' ideas and suggestions</td>
<td>Ignoring or dismissing others' ideas, Disagreeing for the fun of a fight</td>
</tr>
<tr>
<td>Disagreeing in order to find the best solution</td>
<td></td>
</tr>
<tr>
<td>Being willing to change your mind</td>
<td>Refusing to reconsider your position</td>
</tr>
</tbody>
</table>

**TABLE 5.2. Characteristics of constructive versus destructive conflict**

Chapter 6: Revising with Others
- Two types of revisions: feedback vs. direct revision
<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
<th>Benefits</th>
<th>Drawbacks</th>
</tr>
</thead>
</table>
| Feedback     | One person drafts the text, submits it to others for comments, and makes revisions based on these comments. | • Easy to implement: the team does not have to worry about version-control problems.  
• Particularly useful for obtaining global comments from several people. | • The team "puts all of its eggs in one basket" by depending on a single writer.  
• Sections of the text written by different authors can sound different.  
• Writers can ignore or reject feedback from other group members without discussing it. |
| Direct revision | One person drafts the text and then hands it off to another team member, who makes revisions directly to the text and then hands it back. | • Draws on the combined strengths of two or more writers.  
• Particularly useful for making final edits as the document nears completion. | • Easy for one writer to work from the wrong version of the document.  
• Missed deadlines take on added importance because of the complexity of handing off the text from one author to the next.  
• Writers can become upset when other authors change their work. |

**TABLE 6.1. Feedback versus direct revision**

- Ground rules for revision
- Revision Tools
<table>
<thead>
<tr>
<th>Tool</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail message</td>
<td>• Simple to use.</td>
<td>• Difficult to comment on specific sections, paragraphs, sentences, and words.</td>
</tr>
<tr>
<td></td>
<td>• Allows for quick turnaround.</td>
<td>• Inappropriate for final editing stages.</td>
</tr>
<tr>
<td></td>
<td>• Good for global feedback. Lack of editing features keeps reviewers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>focused on &quot;big picture&quot; issues.</td>
<td></td>
</tr>
<tr>
<td>Microsoft Word commenting</td>
<td>• Reviewers can comment on specific sections of text. Comments are off to</td>
<td>• Reviewers may duplicate efforts by making identical comments.</td>
</tr>
<tr>
<td>tools</td>
<td>the side and easily distinguishable from the main text.</td>
<td>• May be difficult to reconcile feedback from different reviewers unless the</td>
</tr>
<tr>
<td></td>
<td>• Teammates can respond to one another's comments and discuss the pros and</td>
<td>team uses &quot;serial&quot; commenting, in which each reviewer comments and then</td>
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<td>cons of various changes.</td>
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<td>• Can be combined with Track Changes.</td>
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<td>Microsoft Word Track Changes</td>
<td>• Easy to see what was changed and to switch back and forth between original</td>
<td>• Only one person can work on the document at a time.</td>
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<td>and revised versions.</td>
<td>• Version-control problems can occur when multiple authors work from different</td>
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<td>• Easy to accept or reject changes another author has made.</td>
<td>versions of the document, writing over each other's changes.</td>
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<td>• Can be combined with commenting tools to provide justifications of</td>
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<td>changes or to query coauthors.</td>
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<td>Google Docs</td>
<td>• Writers are always working from the most current version of the document,</td>
<td>• Lacks a rich set of formatting tools and is inappropriate for documents that</td>
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<td>so the team does not have to worry about version-control problems.</td>
<td>have lots of tables or require extensive formatting features.</td>
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<td>• Combines commenting capabilities with direct revision.</td>
<td>• Comments are inserted directly into the text, sometimes making the text</td>
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<td>• Document resides in a common storage space where the team can keep task</td>
<td>difficult to read.</td>
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<td>schedules and other documents associated with the project.</td>
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<td>Wild</td>
<td>• Pros are similar to those of Google Docs.</td>
<td>• High learning curve for many users.</td>
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<td>• Provides maximum flexibility for creating and linking multiple documents.</td>
<td>• Server may not be stable, and technical support may be unavailable.</td>
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<td>• The team can make project information public and available for comments</td>
<td>• May be difficult to export or print documents.</td>
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<td>or edits from outside audiences.</td>
<td>• Easy to lose, misplace, or miss key information.</td>
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**TABLE 6.3. Advantages and disadvantages of revision tools**
**CHECKLIST**

**Giving Feedback during the Initial, Rough Stage**

**Begin with praise.** In your e-mail to the writer, note one or two things that this draft does really well—even if all you can say is that the draft does a good job getting some ideas on the table.

**Identify/fix oversights.** Look for parts of the text that do not meet the assignment requirements or do not match what the group decided on.

**Suggest/add new material.** What else could be included that would strengthen this draft?

**Note/revise misleading or inaccurate information.** Look for places where the information included is presented in a misleading way or is simply wrong.

**Suggest/execute alternative organizations.** Do you think the organization could be improved? Would you recommend reordering some of the sections? Or creating new headings to make the material easier to skim? Should the recommendations be in a bulleted list rather than in paragraph form? Should any tables be reorganized to better communicate the data's message?

**Identify/resolve inconsistencies in content and argument.** Look for inconsistencies in the information and arguments included. You can address inconsistencies in formatting or vocabulary in later drafts.

**CHECKLIST**

**Accepting Feedback**

**Count to 10.** Before responding to feedback, give yourself a chance to recover from your initial reaction.

**Ask the person why he or she made this suggestion.** You may find that you and the other person agree more than you originally thought.

**Understand criticism.** Before accepting or rejecting feedback, repeat back the criticism, the rationale, and the proposed solution (if one was supplied), and then ask the person to confirm that you understood him or her correctly.

**Receive comments by e-mail.** If you have trouble accepting feedback in face-to-face situations, ask group members to send you an e-mail with their comments and suggestions. This gives you a chance to react to these suggestions in private and gives you time to tone down your initial reactions.

*Chapter 7: Communication Styles/Team Diversity*

- Identifies different communication styles—how to deal with and how to improve your own
- **Action oriented** (jump into details of problem and immediately start working on solution) vs. **holistic problem solving** (consider entire problem as a whole and refrain from proposing solutions until the problem is understood)
- Gendered issues with communication

**Chapter 8: Troubleshooting Team Problems**
- Identifies about 10 typical problems that groups face and offers strategies for dealing with them
- Has exercises and videos.

*Team Writing. Joanna Wolfe. 2010*
This is an authorship page from a First Year Final Project Report

Authorship:

Andrew Aberdale: Data Analysis help, formatting, design

x A. Aberdale

Andrew Libby: Data Analysis lead, Appendix A, Appendix B, Design, formatting

x Andrew Libby

Anthony Perullo: Abstract, Solution, Problem, Approach, grammar, formatting

x Anthony Perullo

Linnea Brown: Abstract, Problem, Solution, Conclusion, formatting, grammar, spelling

x Linnea Brown

Linnea could not be here she had a plane to catch.
Welcome to the Purdue OWL

Contributors: Allen Brizee.
Summary:
This handout provides steps and exercises to eliminate wordiness at the sentence level.

Paramedic Method: A Lesson in Writing Concisely

Use the Paramedic Method (originally developed by Richard Lanham in *Revising Prose*) to edit any kind of professional writing. Editing your professional writing using the Paramedic Method will make your prose easier to read. Sentences that are easy to read are more persuasive and more user-centered.

Professional writers understand the need for clear, concise prose. An industry standard for helping workplace writers achieve user-centered, persuasive, and clear prose is the Paramedic Method. When you use the Paramedic Method, you will reduce your word count by eliminating unnecessary words. The Paramedic Method also helps you activate your sentences by eliminating passive voice and redundancies. The Paramedic Method is an easy to learn, systematic way to make your sentences more persuasive and more user-centered.

Follow the seven steps below to improve the readability of your sentences.

The Paramedic Method

1. Circle the prepositions (of, in, about, for, onto, into)
2. Draw a box around the "is" verb forms
3. Ask, "Where's the action?"
4. Change the "action" into a simple verb
5. Move the doer into the subject (Who's kicking whom)
6. Eliminate any unnecessary slow wind-ups
7. Eliminate any redundancies.
Now You Try

Use the Paramedic Method in the sentences below to practice.

Use the Paramedic Method in the sentences below to practice making your sentences more concise. After you use the Paramedic Method on these sentences, check your results against the sentences at the bottom of this handout.

1. The point I wish to make is that the employees working at this company are in need of a much better manager of their money.
2. It is widely known that the engineers at Sandia Labs have become active participants in the Search and Rescue operations in most years.
3. After reviewing the results of your previous research, and in light of the relevant information found within the context of the study, there is ample evidence for making important, significant changes to our operating procedures.

Example Concise Solutions:

1. "The point I wish to make is that the employees working at this company are in need of a much better manager of their money."
2. "It is widely known that the engineers at Sandia Labs have become active participants in the Search and Rescue operations in most years."
3. "After reviewing the results of your previous research, and in light of the relevant information found within the context of the study, there is ample evidence for making important, significant changes to our operating procedures."

*This handout adapted from a larger piece by Richard Johnson-Sheehan.*
Numeracy Report

Numeracy is a necessary skill to compete in a global economy. In the United States, innumeracy threatens to undermine the quality of American work. Today, jobs require their employees to have a better knowledge of math than in the past. This change causes the definition of numeracy to continuously change with society. The Oxford Dictionary of Education defines numeracy as “the ability to apply and interpret numbers and numerical information”. However, in a report by the British government, numeracy is defined as mathematical skills that “allow an individual to cope with the practical demands for everyday life”.

These different definitions in numeracy lead to different methods of measurement. In the US, numeracy is mainly measured through written tests taken by students while they are in school. The national report card for the US states that what passes for numeracy today is equivalent to about eighty percent of teenagers in high school being able to perform basic arithmetic. While school is the main source of numeracy, it is equally responsible for innumeracy. Mathematical knowledge builds upon itself, requiring mastery of basic concepts before progressing to complex ones. A lack of mastery results in a lack of confidence in mathematical ability, putting students at risk for becoming innumerate. Numeracy is more than something that can be gained and kept; it requires constant use and application.

Much like the US, other countries realize the importance of numeracy. Such significance makes it necessary to measure the numeracy of the population in order to assess the need for
In an ideal world, everyone would be able to solve daily problems and tasks that involve numbers. However, there are many Americans who lack the mathematical skills needed for everyday life. In some areas of the US and other countries, people are having trouble with numeracy. Numeracy, according to the Merriam-Webster dictionary is the capacity for quantitative thought and expression. In other words, one's ability to reason and use numbers.

According to a publication by Lynn Steen, in the journal, Daedalus, only 40% of the nation's 17 year-olds can deal with more complicated problems. Without these abilities, students are unable to do even basic tasks (such as figuring out the tip for a restaurant, or finding the price of an item that is on sale). In this paper, we will explore the ways that children learn numeracy, the reasons why people have trouble learning it and, how to help those who struggle with numeracy.

To understand how children learn numeracy, the University of Illinois held a study. The study focused on the relationship between the early development of literacy and numeracy skills. Specifically, the study looked to see if a child's printed knowledge, vocabulary and phonics had any relationship to the development of their numeracy skills. The study found that vocabulary and printed knowledge each predicted a different aspect of the child's numeracy knowledge. In addition to their own information, the study also noted other studies that suggested children were born with a certain degree of numeracy. Overall, the information suggests that a child's literacy and numeracy do not develop independently from each other. Even if a child starts with a certain degree of either numeracy or literacy, it seems that the understanding of one cannot improve without improving the understanding of the other. It was also interesting that while there was a relationship between numeracy and literacy, not all of the aspects were found to be related to each other (This could mean that exposing children to subjects like written knowledge and vocabulary could better a child's learning in general.)
This weakness may put the US at a considerable disadvantage economically, and perhaps in other areas as well. Percent of the population being considered illiterate, the US is considerably weaker in mathematics and must work to improve.

To improve numeracy rates, more action must be taken. Previous programs have been implemented in attempts to increase the US's numeracy rates. While some improvements have been made, thirty percent of our population is still illiterate. To decrease the illiteracy rate, schools should establish programs helping students understand numeracy from an early age. In particular, there needs to be more individual attention. Attention should be given to students individually to ensure an understanding of mathematical foundations. While every student learns at his or her own pace, numeracy standards should be set for each grade level. If a child is having difficulty reaching these standards, he or she should be given assistance. A student experiencing difficulties may require personalized assistance with understanding numeracy. Without the basics, it is impossible to comprehend higher levels of math.

In his book *STEM the Tide*, David E. Drew suggests a few solutions for reform in math education. He recommends that students have access to "committed mentors and role models." With people to look up to and help them on the way, students will be more driven to learn. Math is challenging and can be difficult to understand. It's important that students know how to solve problems; the notion need, how about solutions to the problems that hinder reform.

Hannah and Dominic -
I appreciate your effort to write a nice, clear, succinct paper. As you can see from my suggested rewrite, a lot of what you are trying to say gets lost in your writing. Overall, the general concern is with presence of many poorly

You also tend to repeat yourselves.
Daniel Kim

Professor Robert W. Traver, Professor Paul E. Kirby

GPS: Ignorance is not Bliss

31 August 2015

The Educated Person

A person who accumulates great amounts of knowledge is not necessarily an educated person. An educated person is one who knows the value of the knowledge that he has accumulated. Socrates, in Plato’s MENO, tells Meno that “true opinions” are not as valuable as knowledge because knowledge is “fastened by a chain”, that is, recollected (Plato 2-3). Recollection of knowledge is long lasting and shows that the person knows the value of his knowledge. Someone who learns to value knowledge is an educated person.

An educated person has certain characteristics. This person must be a curious philosopher, a lover of knowledge. This person must also know right from wrong, and must be intelligent. As Justine Tesha stated in Plato’s Concept of Education, a person must have an “appetitive soul”, imagination, beliefs, and the ability to think (Tesha 3). If a person has no appetite for attaining more knowledge, he does not value education and is unable to become an educated person. Aristotle states that a wise man must know all things, be able to learn difficult things, know how to teach others well (Aristotle 4). This comes naturally for an educated person with a great depth of understanding.

The right knowledge is needed to be an educated person. A person who knows an abundance of useless information is not an educated person. He cannot value his knowledge
is not knowing how to use something. Kim 2

because he does not know how to use it. However, this does not mean that experience in using
information makes an educated person. As Dewey stated, “experience and education cannot be
directly equated to each other. For some experiences are mis-educative... Any experience is mis-
educative that has the effect of arresting or distorting the growth of further experience” (Dewey
1). Experience can produce “lack of sensitivity” and “callousness” that could stunt the growth of
further experience or learning chances.

If truly educated, one strives for more knowledge, not just for the sake of knowledge, but
for the betterment of the world around him as he knows it. There is no reason to strive to learn
unless there are beneficial results to learning. Plato stated, “Education is not what some people
declare it to be, namely, putting knowledge into souls that lack it, like putting sight into a blind
eye. Knowledge is like vision in that it requires an organ capable in receiving it” (Tesha 2). Plato
called the process of making a capable “organ” the “conversion of souls” (Tesha 2). This
“conversion of souls” is the ability to learn or be taught; it is the ability to be open to ideas and to
education. Great effort is required to be teachable and to open one’s eyes to receive “vision”.

Those who value knowledge, however, are able to receive this “vision” and become truly
educated people.

The role of schooling and technology is enormous in forming educated people. Schooling
and technology give people endless opportunities to become educated. Opportunity is the most
important factor in success. With schooling spreading all around the world for all peoples, and
technology advancing, the opportunities for the formation of educated people are increasing. The
appreciation for knowledge and the value of knowledge are becoming known to many educated
people.
Daniel Kim

Professor Robert W. Traver, Professor Paul E. Kirby

GPS: Ignorance is not Bliss

14 September 2015

The Educated Person

The will to learn is necessary to become an educated person. A person must be willing to obtain and retain knowledge to become an educated person. If a person does not retain knowledge, he is not willing to learn. If a person does retain knowledge, he finds it useful to him and is willing to learn about it. Socrates, in Plato’s MENO, tells Meno that “true opinions” are not as valuable as knowledge because knowledge is “fastened by a chain”, that is, recollected (Plato 2-3). Recollection of knowledge is long lasting and shows a person’s intent to expand his knowledge.

A person must be willing to become educated because, as Rich states, “you cannot afford to think of being here to receive an education; you will do much better to think of yourselves as being here to claim one” (Rich 1). A person cannot become educated by merely receiving great amounts of knowledge. Once a person receives knowledge, he must decide whether to grasp it as an important part of his life, or to let it go as a trivial matter. This decision comes from the person’s curious nature. As Tesha stated in Plato’s Concept of Education, a person must have an “appetitive soul”, imagination, beliefs, and the ability to think (Tesha 3). This “appetitive soul” can be translated to the willingness to learn or the desire to be educated.
Once a person attains an “appetitive soul”, becoming educated is much easier. People with an interest in learning new things will want to experience them as well. Therefore, a person with an “appetitive soul” will search for educational experiences. Not all experiences are educational, however. As Dewey states, “experience and education cannot be directly equated to each other. For some experiences are mis-educative…Any experience is mis-educative that has the effect of arresting or distorting the growth of further experience” (Dewey 1). Experience could potentially produce “lack of sensitivity” and “callousness” that could stunt the growth of further experience. However, if a person never experiences anything, he will not be able to learn anything. Therefore, it is good for an “appetitive soul” to look for experiences, but it is also good to be wary of experiences.

Experience alone is not enough for a person to become educated. Plato states, “Education is not what some people declare it to be, namely, putting knowledge into souls that lack it, like putting sight into a blind eye. Knowledge is like vision in that it requires an organ capable in receiving it” (Tesha 2). Plato sees that every person experiences knowledge differently. Some people are what he calls “blind eyes”, people who are not willing to retain knowledge. Others are “organs” capable of receiving vision, people who are willing to learn and retain knowledge. Plato calls the process of making a capable “organ” the “conversion of souls” (Tesha 2). This “conversion of souls” is the ability to learn or be taught, or, as a professor I knew used to call it, teachability. Those who are willing to learn are teachable and will become educated people.

Aristotle states, “ALL men by nature desire to know” (Aristotle 1). All men have an appetite for knowledge by nature. Those who are willing to satisfy this appetite are the ones who will become educated people.
Literacy and Numeracy in Texas, Mississippi and Florida
A Comparative Report

WPI – FY 1100-A06

October 3, 2015
This report compares academic test results for Florida, Texas and Mississippi, from the National Assessment of Educational Progress (NAEP). The report examines the results of reading, writing and mathematics tests at the fourth grade and eighth grade levels. These are indicators of literacy and numeracy. The chart below compares the highest scoring state in each category to the other two states. It shows percentages of the highest score rather than raw scores, because percentages ease comparison between states and between categories. For comparison, it is more significant to say by what percentage two states differ, than by how many points.

Scores of Texas, Mississippi and Florida as a Percentage of the Highest of the Three Scores on Each of Several NAEP Tests on Reading, Writing and Mathematics

The data show fairly comparable scores in reading, writing and mathematics for Texas and Florida. Texas scores 1.1% less than Florida in the average category. Texas scores between 4.4% less (in Writing Grade 8) and 2.9% more (in Mathematics Grade 8) than Florida. Texas scores lower than Florida predominantly in writing, in which it is 2.5% lower in fourth grade and 4.4% in eighth grade. Texas is also 1.8% lower in Reading Grade 4, and about equal in Reading Grade 8 and Mathematics Grade 4. The exception is that Texas scores 2.9% higher in Mathematics Grade 8.

By contrast, Mississippi scores lower than Texas and Florida on all six tests. Mississippi scores 6.2% less than Texas and 7.2% less than Florida in the average category. On average, Mississippi scores 5.7% less than the second lowest (median) scorer in each category. Mississippi scores between 3.8% less (in Reading Grade 8) and 8.4% less (in Writing Grade 4). The greatest gap between Mississippi and the median scorer is in writing, both at the fourth grade level (8.4% less) and the eighth grade level (6.0% less). In reading, Mississippi scores 5.5% lower in fourth grade and 3.8% lower in eighth grade than the median scorer. In mathematics, Mississippi scores 5.4% and 5.0% lower.
Texas and Florida Beat Mississippi on Reading, Writing and Mathematics NAEP Tests

We compare academic test results for Texas, Mississippi and Florida, from the National Assessment of Educational Progress (NAEP). The tests are on reading, writing and mathematics knowledge at the fourth grade and eighth grade levels. Each black, horizontal line shows the average of a reading, writing and mathematics score. Texas and Florida perform comparably, but Mississippi scores considerably lower.

Average NAEP Scores in Reading, Writing and Mathematics of Students in Texas, Mississippi and Florida
The performance of Florida and Texas on the NAEP tests is comparable. Florida does score slightly higher in each of the three subjects in fourth grade. Texas and Florida respectively score 220 and 224 in reading, 154 and 158 in writing and 240 and 242 in math. In eighth grade reading, Texas scores 261 and Florida scores 260. However, the differences in eighth grade writing and math are greater. In eighth grade writing, Texas scores 151 and Florida scores 158. In eighth grade math, Texas scores 287 and Florida scores 279. The averages of reading, writing and mathematics scores for Texas and Florida are similar, as shown by the black, horizontal lines.

However, Mississippi consistently scores lower than Texas and Florida. As a result, the average of reading, writing and math for Mississippi is 192 at the fourth grade level, compared with 205 for Texas and 208 for Florida. At the eighth grade level, Mississippi averages 219, while Texas averages 233 and Florida averages 232. The difference between Mississippi and the other two states in reading and writing decreases a little from fourth to eighth grade. In fourth grade reading, Mississippi scores 208, while Texas scores 220 and Florida scores 224. In eighth grade reading, Mississippi scores 250, while Texas scores 261 and Florida scores 260. In fourth grade writing, Mississippi’s score, 141, is notably lower than Texas’, 154, and Florida’s, 158. This difference decreases a little in eighth grade writing. Mississippi scores 142, while Texas scores 151 and Florida scores 158.
Texas and Florida Beat Mississippi on Reading, Writing and Mathematics NAEP\(^1\) Tests

Composite NAEP Scores of Fourth and Eighth Grade Students in Mississippi, Texas and Florida on Mathematics, Reading and Writing Tests

![Composite NAEP Scores Chart]

**Description**

This chart shows composite NAEP test scores for fourth and eighth graders in three states. The three states are Mississippi, Texas and Florida. A composite score for the performance of each state at each grade level is graphed. The composite score equals the sum of the mathematics, reading and writing score. Each composite score is represented as a stacked column. The column’s three parts show the contribution of each subject score to the composite score. The bottom part represents a math score; the middle, reading; and the top, writing. The graph allows the viewer to compare between the three states at both grade levels. Composite scores highlight the performance of a state across multiple subjects.

\(^1\) National Assessment of Educational Progress
The graph shows that for fourth grade, Mississippi has the shortest composite score bar. Mississippi’s fourth grade composite score is 576; Texas’ is 614; and Florida’s is 624. In mathematics, Mississippi scored 227, Texas scored 240 and Florida scored 242. In reading, Mississippi scored 208, Texas scored 220 and Florida scored 224. In writing, Mississippi scored 141, Texas scored 154 and Florida scored 158.

The graph shows that for eighth grade also, Mississippi has the shortest composite score bar. Moreover, it is visible that Texas’ and Florida’s composite score bars are similar in height. Mississippi’s eighth grade composite score is 657; Texas’ is 699; and Florida’s is 697. In mathematics, Mississippi scored 265, Texas scored 287 and Florida scored 279. In reading, Mississippi scored 250, Texas scored 261 and Florida scored 260. In writing, Mississippi scored 142, Texas scored 151 and Florida scored 158.

Composite NAEP scores for two grades, three states and three subjects have been presented in a chart. The information and format of the chart have been described.
Hey guys - the writing here is excellent. It has a professional report tone to it. Outstanding if you guys are writing this on your own; good work if you've found someone to help you. The organization is clear and effective. If the final version comes in with this kind of presentation you're in terrific shape.

Recommendations for a New Learning Management System at WPI - Final Report

Eva Barinelli, Brian King, Daniel Wivagg

November 30, 2015

EXAMPLO

DRAFT

FINAL PROJECT REPORT

FIRST YEAR
# Table of Contents

I. Introduction .................................................................................................................. 2
II. Problem Statement ....................................................................................................... 2
III. Approach .................................................................................................................... 3
IV. Solutions ..................................................................................................................... 4
    A. Recommend a Replacement for Blackboard .............................................................. 4
    B. Faculty Training Program ...................................................................................... 4
V. Methodology .................................................................................................................. 5
    A. Student and Faculty Surveys .................................................................................... 5
    B. Student LMS Trials ................................................................................................ 5
    C. WPI Evaluation Criteria .......................................................................................... 6
VI. Assessment Method ..................................................................................................... 6
VII. Results ........................................................................................................................ 7
    A. Unviable LMS’s ....................................................................................................... 7
        1. Blackboard Ultra ................................................................................................. 7
        2. Google Apps for Education ................................................................................. 7
        3. Lore ...................................................................................................................... #
        4. Moodle ............................................................................................................... #
        5. Pearson ............................................................................................................... #
        6. Sakai .................................................................................................................... #
        7. Social Media ....................................................................................................... #
    B. Viable LMS’s .......................................................................................................... #
        1. Canvas ............................................................................................................... #
        2. Desire2Learn ..................................................................................................... #
        3. Schoology ......................................................................................................... #
VIII. Recommendations ................................................................................................... #
IX. Assessment Results .................................................................................................... #
X. Appendix ..................................................................................................................... #
    A. Ken Wilber AQAL Model ....................................................................................... #
    B. Student Survey Results ......................................................................................... #
    C. Faculty Survey Results .......................................................................................... #
    D. WPI Criteria for LMS Selection ............................................................................. #
XI. Bibliography .............................................................................................................. #
I. Introduction

This report examines the learning management system (LMS) used by WPI and recommends a replacement system. Currently, WPI uses Blackboard to provide supplemental course materials to students via the internet. Blackboard has serious drawbacks, such as the difficulty of use, the cost of operation, and the effort required to maintain the system. Three LMS's are considered as alternatives to Blackboard: Canvas, Desire2Learn (D2L), and Schoology. Each system meets WPI's needs better than Blackboard, however the best choice for WPI would be to implement Canvas as a replacement. Canvas best meets the needs of the school, of the students and faculty, and of the system administrators.

II. Problem Statement

WPI needs a more user-friendly LMS to promote teacher and student utilization. Complex LMS's discourage faculty and students from utilizing LMS's to enhance learning beyond the classroom (Naveh et al, 2010). Students and faculty feel they are wasting time learning to use complex LMS's such as Blackboard.

Research shows that faculty at institutions of higher education are more likely to use an LMS if it is user friendly and tailored to their needs. (De Vries, 2014) Similarly, students must be able to interact easily with the LMS for maximum benefit. (Zaeri, 2013) These conditions are not currently being met by Blackboard. As a result of the system's shortcomings, faculty and students at WPI are dissatisfied with Blackboard. The system is perceived as difficult to use and
cumbersome. This leads to less usage system-wide, and students and faculty miss out on the chance to enhance learning. (Calisir et al, 2014)

III. Approach

The first step to our approach was to use the Wilber AQAL Model (App. A). This model is a binary matrix that splits a problem into interior/exterior and individual/collective aspects. The quadrants are labeled intentional, behavioral, cultural, and social systems. The intentional quadrant evaluates an individual’s values and beliefs. The behavioral quadrant looks at an individual’s skills and behavior. The cultural quadrant assesses collective values and relationships. Finally, the social systems quadrant evaluates economic, governmental, educational, and transportational systems.

The Wilber AQAL Model was used to identify the sources of our problem. The intentional quadrant shows students understand the benefits of Blackboard, however faculty are reluctant to learn the complex system. The behavioral quadrant shows students and faculty are not using Blackboard to its full extent. The cultural quadrant shows a collective dislike towards Blackboard among students. Faculty have been reluctant to replace the system implemented in 1997. The faculty’s resistance was caused by the lack of viable options. There were no other LMSs with the functions WPI required. Lastly, the social systems quadrant shows students and faculty are bound to the use of Blackboard.
IV. Solutions

A. Recommend a Replacement for Blackboard

Based on the data from the Wilber AQAL Model, our solution is to recommend a replacement for Blackboard, including a timeline for implementation. Ideally, a new LMS would save WPI maintenance time, money, and data storage space. This solution would be fully implemented during the 2017-18 Academic Year, following the expiration of WPI's contract with Blackboard. There are several pros to this solution. Due to the intuitive and easy interface, the new LMS would encourage widespread use. A new LMS would also remedy negative attitudes towards online learning at WPI. However, there are a few cons. Historically, faculty have resisted changing the LMS. This plan will not be fully implemented until the 2017-18 academic year. There will still be no pressure on faculty to utilize the new LMS to its full extent, and some faculty may still choose to use personal websites. Finally, there will be a learning curve for those choosing to use the new LMS.

B. Faculty Training Program

An alternative solution, create a training program for faculty on effective use of Blackboard, was considered. The program would provide a WPI-specific curriculum that would likely include tutorial videos and PowerPoint presentations. This alternative solution is a simple short term solution. It avoids overhauling WPI's LMS, so all data will be preserved. Additionally, all students and faculty have some experience with Blackboard, and most faculty would prefer to keep Blackboard. With better training, faculty would be more encouraged to use Blackboard. There are still cons to this solution. Students will still collectively dislike Blackboard because it
will remain cumbersome and unintuitive. Since training cannot be mandated, there is no guarantee of improved effectiveness of Blackboard usage. Considering both solutions, recommending a replacement for Blackboard is a better solution because of its long term benefits.

V. Methodology

A. Student and Faculty Surveys

The first step to our solution was to gain information on what faculty and students consider to be important functions in an LMS. This information helped us recommend a replacement LMS that better met the needs of students and faculty. We created a survey for the undergraduates at WPI (App. B). Students were asked to evaluate the current functions, and if there were any functions they wished the current LMS had. WPI’s LMS Evaluation Committee sent out a survey to the faculty (App. C). Faculty were asked how satisfied they were with certain Blackboard functions. Both surveys helped us figure out the functions our recommended LMS should have, in addition to what our research showed was important.

B. Student LMS Trials

In addition to the surveys, we had two students from each grade trial Canvas, Schoology, and D2L. Each student spent ten minutes on each LMS. During the trial, students were asked to complete certain tasks. Students were asked to navigate to a course, check the syllabus, take a quiz, post something on the discussion board, check their grades, and turn in an assignment.
After completing these tasks, the students were asked if they liked any of the LMSs better than Blackboard and which one they liked the best.

C. WPI Evaluation Criteria

WPI’s LMS Evaluation Committee created a set of criteria that outline our school’s needs in an LMS (App. D). These criteria helped us narrow down our initial list of LMS’s.

Using the results from the surveys, feedback from the student trials, and the criteria, we selected one LMS as the ideal replacement for Blackboard.

VI. Assessment Method

To assess the viability of our solution we will seek feedback from WPI’s LMS Evaluation Committee. The solution will be successful if the committee decides our recommendation is legitimate and helpful. Data will consist of written and oral feedback from LMS Evaluation Committee members. We will ask the committee to review our finished report and give feedback about the feasibility and thoroughness of our solution. Improvements to the solution can be made if the feedback suggests they are necessary. The committee’s opinion of our solution will determine our solution’s success. If the committee thinks our solution is worthy of consideration while evaluating a new LMS for WPI, our solution will have been successful. If they think our solution is not thorough or helpful, our solution will have not been successful. Feedback from the committee is the only short term assessment of our success because our solution cannot be implemented immediately.
VII. Results

A. Unviable LMS’s

The initial pool of LMS’s included several that were not viable options for WPI. They are listed here, along with the reasons they were omitted from our final three.

1. BlackBoard Ultra (BB Ultra)

Blackboard Ultra was ruled out due to a lack of available information. The trial for BB Ultra will be released in the beginning of 2016, and there are limited screenshots of the new user interface available. While BB Ultra will meet the vast majority of WPI’s LMS Criteria, we also felt that Blackboard has historically been slow to upgrade its product. Remaining with a company with a track record for slow advancement seems backwards for WPI.

2. Google Apps for Education

Google Apps for Education has an excellent user interface and excellent customer support. Collaboration between students and faculty would be very simple and very effective. Additionally, Google Apps for Education is a free cloud-hosted LMS. However, Google Apps for Education does not currently support many functions vital to WPI. There is no capability for Banner, LTI, or textbook integration. The gradebook feature is subpar at best, and it is not possible to merge multiple sections under one course.

3. Lore

4. Moodle
It is possible to create a thorough and excellent LMS with Moodle. There is an extensive community of support and developers, and the LMS is free. However, implementation would require extensive development on behalf of WPI. Furthermore, it impossible to directly outsource Moodle to the cloud. These drawbacks immediately disqualify it as a possibility.

5. Pearson OpenClass
Pearson offers OpenClass, a free, cloud based LMS. Although OpenClass advertises many benefits such as a simple, modern, user interface, good collaboration tools, and a strong mobile platform, our team was unable to obtain access to OpenClass in any way, nor could we make contact with Pearson about the service. As a result, we could not evaluate it as a replacement for Blackboard.

6. Sakai
Similar to Moodle, Sakai can be very flexible and sturdy, but it is also open source and not immediately cloud based. It would require too much effort from WPI to create an LMS with Sakai.

7. Social Media
Facebook was the major social media that was considered. It was looked at because many students faculty are familiar with it. Facebook groups encourage discussion and collaboration. However, Facebook groups were not originally created to support academic learning. Furthermore, Facebook does not have many functions necessary to be a WPI LMS. Facebook is not compatible with other WPI sites (Banner, LTI, or textbooks). There is no gradebook
function. Past studies have shown students have found it difficult to navigate the site to find specific assignments. Instructors complained of a privacy barrier being broken if Facebook was used as an LMS. “Many students too are not interested in this exposure; they prefer a separation between learning space and social space” (Meishar-Tal, 2012). Overall, Facebook was missing too many valuable functions to be considered an LMS.

B. Viable LMS’s

The three LMS’s we considered for final evaluation were Canvas, Desire2Learn (D2L), and Schoology. Each meets the basic WPI LMS criteria, and each would fulfill the needs of the WPI community.

1. Canvas

Canvas has been a rising competitor in the LMS community. Since 2008 Canvas’ market share has increased dramatically and is still increasing. Canvas has a modern interface with drag and drop functionality to make adding assignments and assessments to courses easy. The gradebook function is not as advanced as WPI would like. Besides its gradebook function, Canvas satisfies the LMS Evaluation Committee’s criteria. A majority of LMS users that converted to Canvas came from Blackboard. Moreover, Canvas’ experience would make configuring courses from Blackboard to Canvas a smooth process. Canvas is compatible with other WPI websites: Banner, LTI integration, and textbook integration. Unlike Blackboard, Canvas is cloud based. Additionally, Canvas is free and would save WPI money.

2. Desire2Learn (D2L)
3. Schoology

VIII. Recommendations to WPI

This is the deliverable of our project, where we will outline which LMS we chose and why, and a timeline for the replacement of Blackboard with that LMS.

IX. Assessment Results

Here we will present the feedback of the LMS replacement committee regarding our solution.
X. Appendix

A. Ken Wilber AQAL Model

B. Student Survey Results

The student body was surveyed to find out how satisfied students are with Blackboard, and what features of an LMS they find important. Students were asked the following questions:
1. What year are you?

2. How many times per week do you access Blackboard?

3. What functions of Blackboard do you use most often? (Select from: Checking grades; accessing assignments; submitting assignments, taking quizzes/tests; accessing lecture notes/videos and readings; accessing course information; discussion boards; checking class announcements; or fill in the blank for other uses.)

4. What functions of Blackboard need improvement? (Select from the categories listed in question 3.)

5. Why do these functions need to be improved?

6. Do you have any other comments about your experience with Blackboard?

7. Please rate the following LMS functions in terms of how important each is to you as a student: checking grades; accessing assignments; submitting assignments, taking quizzes/tests; accessing lecture notes/videos and reading; accessing course information; discussion boards; class announcements; simplicity; mobile app; calendar; task list. (Mark each function as Unnecessary, Unimportant, Neutral, Important, or Critical.)

8. Are there any other functions you would like to see in WPI's Learning Management System?

9. Have you had any previous experience with a Learning Management System?

10. What LMS have you had previous experience with?

11. Please rate your opinion of this LMS on a scale of 1-10.

12. Please compare this LMS to Blackboard. (On a scale of 1-5, Worse-Better.)

13. What did you use this LMS for? (High school course, dual enrollment course, or other.)
14. What functions of this LMS did you use? (Select from functions in question 7.)

15. Are there any functions this LMS should have had?

16. Can you give any additional feedback about your overall experience with this LMS?

C. Faculty Survey Results

The LMS evaluation committee provided results from a survey of faculty members. These results highlight issues with Blackboard and what features of an LMS WPI faculty find important.

D. WPI Criteria for LMS Selection

According to the WPI LMS evaluation committee, the following are criteria for choosing a replacement to Blackboard.

The LMS should:

Provide a robust environment for content authoring
Faculty should be able to easily create learning objects natively within the LMS as well as link in from third-party sources, content management systems and learning tools. The system should possess functionality to reduce the number of clicks needed to generate quality content. The LMS should allow easy import/export of content from other LMSs.

Support WPI’s teaching and learning needs
WPI offers a variety of course formats, face-to-face, blended and online. The LMS should therefore support a variety of pedagogical approaches and course delivery methods and have flexibility for how teaching and learning takes place. The more important LMS teaching and learning tools identified by our faculty in the survey were Assignments, Grade Center, Announcements, Content Collection, Videos and Discussion Boards.

Support student and faculty collaboration
Students are looking for a virtual meeting space solution where they can share and edit content for group and project work. Feedback we received on our survey indicated that the Discussion Board tool in myWPI was out of date and that social media may offer a
more modern collaboration solution. A new LMS would include or be able to integrate seamlessly with tools that support the need for flexible, synchronous and asynchronous virtual meeting and discussion spaces.

Provide grading, assessment and grade management tools
Grading and assessment were indicated as primary teaching tools used in myWPI. Assessments should be intuitive to set up as well as use. There should be a variety of question formats and should allow math formulae (LaTeX) and media embeds. The Gradebook should be accessible from all web browsers, not require plugins to function, including mobile or tablet devices. Student work should have a variety of ways to be graded: group work, individual, auto_graded, manually. Grades should be able to be exported to outside software programs (Excel), allow for formulas and weighting, displayed by letter, percentage, points, and complete/incomplete.

Possess an intuitive interface and contemporary look and feel
While all new software requires a breaking in period, a new LMS should not require significant investment in training to accomplish basic tasks. Technology should not get in the way of teaching and learning, it should enhance it. The amount of clicks required to achieve course design should be reduced. Modern design standards dictate a flat design (items not buried within levels of folders), drag-and-drop, multi-device compatibility and usability.

Be mobile optimized and work on a variety of web browsers
Faculty identified that they access the current LMS on desktop, laptop and mobile devices. WPI had 1,338 unique visitors accessing the LMS from a mobile device in 2015. The LMS should be responsive to the user’s device with little effort on the user’s part and/or provide an app for content creation and consumption.

Meet 508 accessibility, Web Content Accessibility Guidelines WCAG 2.0 AA and disability standards
The LMS should comply with all accessibility guidelines. It should be fully operable using only a keyboard, be readable and operable using commonly used screen readers, and add alt text to images and headings to text content. It should allow user personalization to modify presentation style.

Support learning analytics and outcomes
Analytics have the potential to help students, teachers and WPI make better choices and lead to improved learning outcomes. Teachers should be able to monitor and make adjustments based on student progress. Especially in an online and blended learning environment, it is important to know which students are participating, and which students need more help. Analytics can also help provide important information for the institution
such as student retention. Having effective analytics tracking within an LMS can help improve student success and their overall experience at WPI.