

Using formative assessments to improve critical thinking & writing skills

Presented by Sydney E. Brown as part of the
[Agronomy & Horticulture Seminar Series](#)
on January 20, 2017 at the University of
Nebraska-Lincoln. go.unl.edu/five-cats

In one minute, describe ways your students will use writing in their future positions.

Audience Ideas: How students may use writing

- Report to supervisors or clients
- Use tech to write advertising, position descriptions, product evaluations
- Write to employees / corporate memos
- Reports: research, field, sales
- Soil tests
- Grant/research proposals and update reports, journal articles, emails to collaborators
- Annual performance reports
- Ads to hire people - staff & students
- Communicate product development to peers
- Interview preparation, newspaper article review and writing
- Communicate directions, specify conditions, summarize daily activity
- Social media outreach

Audiences

- Colleagues, Supervisors, Customers
- Major professor, committee members, anonymous reviewers, journal editors, grant panels, grant officers, grant collaborators
- Hiring managers, HR people

Minute Paper / Half-Sheet Response

- Minimal time and effort > keen insight to student understanding
- Learning goals
 - Synthesize and integrate information and ideas
 - Think holistically: See the whole and the parts
 - Improve attention, concentration, and listening skills
 - Learn concepts and theories as well as terms and facts
- Adaptable
 - Use as warm-up or summary activity
 - Significant point, muddiest point, most illuminating example, most convincing argument
 - Compare at different time points during the term

Directed Paraphrase

- Low to medium effort
- Learning goals: apply principles to new situations, learn concepts & theories
- Most useful for assessing student understanding of topics or concepts they will later be expected to explain to others
 - In their careers, who are some of the different audiences with whom your students will communicate?
 - What are some concepts in your class that will play a role in these communications?

Directed Paraphrase

- Students explain a concept to a specific audience
 - *You study ichthyology and in order to pursue your interest in African cichlids and earn some extra cash, you have taken a job at a local aquarium shop. You notice customers complaining of fish dying after purchase. In overhearing their conversations with the manager, you realize they do not understand the nitrogen cycle and the importance of cycling their tanks before adding fish. Hoping to reduce the number of needless fish deaths and make fish-keeping more enjoyable for customers, you volunteer to create a one-page handout about the nitrogen cycle and setting up a tank that fifth and sixth grade children can understand.*

Audience Ideas: Directed Paraphrase

Growers have a new pest attack their crops and don't understand why it takes so long to develop a resistant cultivar. Explain the process in a way they will understand.

Students could try to explain their research article to a 5th-6th grader to help them simply and concisely write about their research - this would allow a bigger audience to understand it

Explain the problem of C:N Ratio to Nutrition Supply in a flower bed where woodchip mulch is applied to home gardeners to help them decide if they should incorporate wood chip mulch into their annual beds.

Explain malolactic fermentation to beginning winemakers hoping to be savvy wine consumers

Analytic Memo

- Higher investment of time and effort
- Targets analytic and problem-solving skills
- Especially useful in subjects related to policy making such as environmental studies or reports executive management may use to make decisions
- How to do it
 - Identify a well-focused and typical problem or situation for students to analyze
 - Specify who is writing the memo and for whom it is being written as well as its subject and purpose

Audience Ideas: Analytic Memo

Problems: NO₃ Leaching, Land User / Permit Seeker, Crop Insurance, Price Supports

Roles: Analyst/Executive decision maker, Land Manager, Lawmaker, Land User, Soils/Site Professional

Benefits and drawbacks of using industrial waste in a plant growth/production situation.

Defend your breeding method and compare with alternatives

Why should we invest in GMOs/hybrid wheat/new technology?

Why should we expand in small grains breeding?

Why do we need a strategic plan for small grains?

Paper or Project Prospectus

- Medium to high effort
- Learning goals include the ability to apply principles and generalizations to new situations, ability to synthesize and integrate information and ideas, develops appropriate study skills, strategies, and habits along with management skills.
- For students: Immediate relevance and provides practice in a valuable and transferable skills
- For instructors: Gives preview of student interests and forewarns of problems and questions. Improves quality of final product.

Paper Prospectus

Proposed title:

Purpose (What will this paper do for the reader? For you?):

Major question(s) you hope to answer:

Work calendar (How will you spread the work out? When will you do it?):

Proposed table of contents/list of major sections:

Help/resources needed (What do you need in order to do an excellent job?):

Your biggest concern(s) or question(s) about the paper:

Project Prospectus

Brief project description (What do you plan to do?):

Project site/setting (Where and with whom will you work?):

Major question(s) you hope to answer/goal(s) you hope to achieve:

Products/results (What will be the measurable outcomes of your project?):

Resources needed (What do you need in order to do an excellent job?):

Calendar of component tasks (When will you complete each part of the project?):

Your biggest concern(s) or question(s) about the project:

Applications Card

- Low to medium effort
- Learning goals: Principles and generalizations to new situations, draw reasonable inferences, learn concepts and theories, capacity to think for oneself
- After students learn about principle, generalization, theory, or procedure, instructor hands out index cards and asks students to write down at least one real-world application for what they have learned

We have discussed five ways to assess student understanding in order to inform our teaching practice. These assessments also improve student writing skills. How might you apply what we've talked about in one of your courses?

1. What is your most significant take-away from this session?
2. How might this session be improved?

Online: <http://go.unl.edu/re60>



Thank you

- If you would like help implementing one of these techniques in your class, either as specified or supported with technologies, or to learn more about CATs, please contact me. (sbrown3@unl.edu)
- These techniques and many others are explained in detail in [Classroom Assessment Techniques: A Handbook for College Teachers](#)
 - [One-Minute and Muddiest Point](#)
 - [Directed Paraphrase](#)
 - [Analytic Memo](#)
 - [Paper or Project Prospectus](#)
 - [Application Cards](#)