

WRITE RIGHT!

Owners' Manual Project Develops Communication Skills

By Mike Fitzgerald
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BACK when I taught at Driver Middle School, I wanted to develop a learning experience for my students that would address the safe use, control, repair and disposal of technologies. One idea I came up with was to have my students produce an owner's manual for a product.

This article introduces an activity based on Standard 12 of the *Standards for Technological Literacy* that will help your students develop good writing skills. It also describes the elements of a writing prompt and of a rubric, the advantages of using rubrics and the writing development process itself.

Finally, I will provide an activity through which your students can apply what they have learned about writing development to produce an owner's manual for a product or invention of their own creation. My overall intent in this article is to review the basic methods used to teach writing development, along with a process used by many teachers and standardized tests to evaluate student writing.

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Introduction

Many teachers find themselves challenged to improve their students' writing skills. One common approach is termed "writing across the curriculum." In essence, educators are asked to increase the expectations of student work through writing development tasks. The first impact on the classroom teacher is that they must learn—and learn how to teach—the writing development process.

The teacher must also learn how to evaluate students' writing. Typically, teachers accomplish this through in-service activities that show them how to apply writing prompts and rubrics to student

work. A number of teachers express uneasiness about the challenge of "writing across the curriculum" demands. I've found that technology educators can easily integrate writing across the curriculum through the use of a design brief.

Elements of a Writing Prompt

Writing-development activities aim to increase students' capacity to write clearly and effectively. A writing prompt is simply a method that you can use to help your students write about a particular topic. In describing a writing prompt, the following "elements" such as title, topic sentence and criteria set will

Fig. 1—Sample writing prompt

Title: What I look for in a friend

Topic sentence: Friends are important to everyone.

Assignment: Write an essay that describes three positive characteristics that you expect to find in a new friend. Describe in detail why you consider each of these characteristics important in a friend.

Criteria set:

- Why friends are important.
- Three positive characteristics you look for in a friend.

- Reasons the three characteristics are important if someone wants to be your friend.

- A beginning, middle and an ending for your essay.

- Use of correct spelling, punctuation, grammar and paragraphing.

- The final draft should be 1-2 pages long.

be used. See Fig. 1 for an example.

The example prompt begins with a *title* that is based on a selected topic. The prompt then presents a *topic sentence* to help focus the student on the writing task. The task itself is then described so the student can begin to organize relevant ideas and information in a logical context. Finally, a prompt includes a set of criteria, or *criteria set*, to review. The criteria set further helps the student to focus the writing task to meet requirements that will undergo evaluation.

Elements of a Rubric

A *rubric* is a tool that measures the knowledge and skills that you want your students to learn. Educators can create rubrics to measure student growth in various content areas such as math, science, art, history, language arts and technology education. You can also use a rubric to direct students toward the goals of a learning experience. In other words, a rubric can serve as both an evaluation tool and an outline of learning objectives.

A rubric defines the elements on which you will judge students. The criteria or objectives to be evaluated are divided into expected levels of achievement. The elements for evaluation tie closely to the expected objectives within a lesson.

The levels further divide into numeric values to describe performance. A scale of values is then used to communicate with the student (and parents) the level of proficiency that the student has achieved. The scale is based on a four-point graduation. A four-point response would thus be an exemplary document. A one-point response would indicate a need for drastic improvement.

Advantages of a Rubric

Use of rubrics can benefit students, parents and teachers alike. Again, a rubric serves as a tool to define expectations of "quality" between teacher and student. It can also further effective communication between students and parents.

Rubrics help students and parents "learn" the expectations of an

assignment. They are especially useful in helping the teacher communicate to parents the academic objectives of an assignment. They can help parents assist the teacher in improving the quality of their student's coursework.

Another benefit of using rubrics involves teaching your students how to set and achieve objectives. Goal setting helps students learn how to focus their efforts and learn more effectively. Finally, the use of rubrics helps the teacher, in that their creation of projects and lessons can guide the overall instructional focus. They can help the teacher focus on

the most important elements of instruction.

The Writing Development Process

For many teachers who are not language arts instructors, addressing writing development can be an unnerving proposition. But we can describe the writing process in five easy steps: *pre-writing*, *writing*, *revising*, *editing* and *publishing*. Start your instruction by teaching students about the five steps.

We can describe *pre-writing* as the development of initial ideas. In the pre-writing stage, students gather

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information about a topic. This is similar to the process students may use to learn about a topic in the problem-solving process.

Students will conduct research using magazines, newspapers, books or the Internet. They may draw on personal experience or the experience of experts. Information gathering is the overall goal of all pre-writing activities.

Students may organize the information gathered in their pre-writing activities in a variety of ways: mapping, webbing, listing or journaling. All of these activities can help students with both writing and problem solving in technology education.

Writing is the stage in which students apply the information gathered in the pre-write. In this stage, the student creates the rough copy of the document. The teacher should remind students that they do not have to include everything that they learned in the pre-writing stage. You should also remind them to be sure to complete their ideas.

Often students ask how long their rough draft should run. Instruct

them that it should contain enough content to meet project requirements, and if they do not produce adequate content, you can guide them back to their pre-writing notes for more information.

Revising the document involves students determining ways to improve their rough draft. Here, students look for weaknesses to repair. They will try to improve their writing to make it more clear, interesting or informative. Students will practice revising the writing itself, improving informational content and refining document organization. They might add information to make the document more detailed or rearrange information to improve the document's logic and order. They should remove unnecessary information.

In *editing*, students seek out errors in spelling, punctuation, grammar and sentence structure. Students can edit their work using a variety of methods. One common process involves a self-edit/peer-edit process. Here, students first find errors and make corrections on their

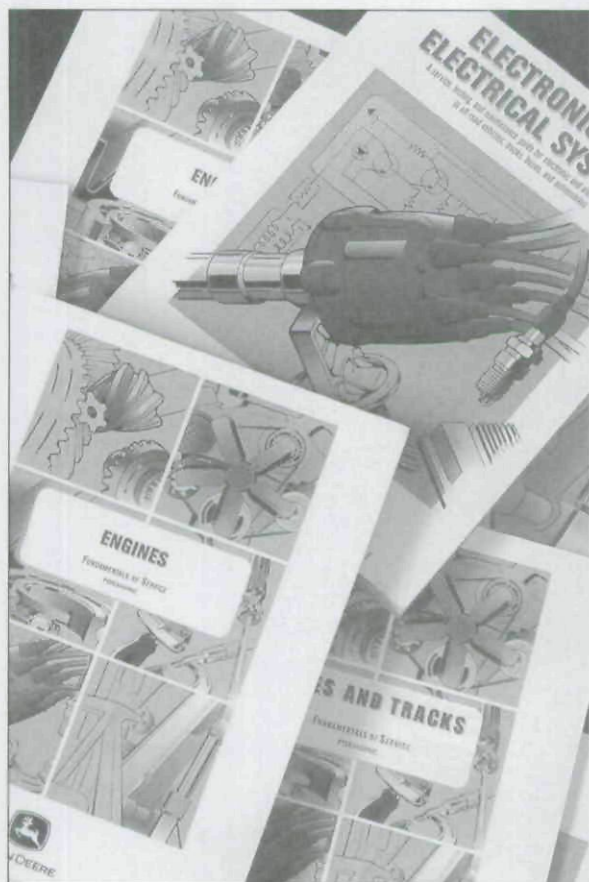
own. Then, they trade documents with a classmate for a re-edit.

In the final step in the writing process, *publishing*, students produce a final copy for evaluation. The published document will typically require a heading, proper indentation and spacing and margins set to the teacher's expectations. Other requirements may include document length, whether hand written or computer generated and type style and size.

The teacher may require students to turn in their final copy, rough copy (with evidence of revision and editing) and documentation of pre-writing activities. The teacher then uses the collection from the entire writing process to determine student progress and evaluation results.

Activity Overview

In this activity, students will prepare an instruction manual for a technical product or project. This activity can demonstrate the extent of knowledge gained in a technical activity and help develop the stu-



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Owner's Manual Project

You are to invent a "must have" item and then make a five-page user's manual for it. Use written directions along with detailed diagrams to instruct consumers in correct use of your product. The product may be based on something you actually constructed or on something that you dream up.

Design Brief

Your employer INN APP (INNOvative All Plastic Products) has tasked you with developing a new "must have" item. Your prior work has created items such as the Pocket Watchman and a TV the size of a pocket watch. You also created the Talky Walky, a phone built into an athletic shoe. Unfortunately, no one wanted to talk into a stinky shoe!

Your current research has led to the development of the toothpaste pump brush, a toothbrush that pumps toothpaste directly onto the bristles. Management, however, keeps brushing your current project aside, claiming that all good INN APP products to be advertised on TV must also have an exciting and INNOvative APPLICATION.

So, today you will begin new research. Your item must have at least one plastic part and be a "needed item," that is, a tool or product that can make people's lives better or easier. It can be an improved technological spin-off of a product that already exists.

Resources

Time: One week

Materials: Various art supplies and materials for construction

Human resources: One student

Money: Prototypes should cost little or nothing to produce and should be constructed from recycled or reused materials.

Knowledge/information: Textbooks, newspapers, magazines, library resources, Internet research, problem solving, expert advice.

Elements to Include in the manual

- Cover
- Introduction
- Safety procedures
- Product features, parts and functions diagram
- Troubleshooting procedure
- Disposal procedures

Owner's Manual Rubric

Score: 4 Points

The author is focused on the task and the topic throughout.

Ideas are formed logically.

The author demonstrates good usage of words.

The author demonstrates above average writing technique.

The author effectively adjusts the language and tone to the audience.

Score: 3 Points

The author stays mostly focused on the topic and task.

The ideas are formed logically in most parts of the document.

The author exhibits adequate word usage in most of the document.

The author demonstrates adequate writing technique.

The author attempts to adjust language and tone to the task and the reader.

Score: 2 Points

The author stays somewhat focused on the topic and task.

The author includes minimal relevant ideas and information.

The author attempts to organize ideas logically.

The author exhibits minimal word usage.

The author demonstrates minimal writing technique.

Score: 1 Point

The author exhibits less than minimal focus on topic and task.

The author includes few relevant ideas or little information.

The author does not organize ideas logically.

The author exhibits less than minimal word usage.

The author demonstrates less than minimal writing technique.

The author uses language and tone that is not appropriate to the task and reader.



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dent's literacy skills. Students should begin the activity by bringing a variety of instructional manuals to class for show and tell and further discussion. Examples might include manuals for computers, lawn mowers, toys and so forth. The teacher should lead a discussion of the elements common to instructional manuals. A list of common elements might include:

- Manual cover
- Introduction to the product
- Safety procedures
- Product features, parts and functions diagram
- Troubleshooting
- Disposal procedures

Using a chalkboard, the teacher might aid in the discussion by categorizing the common elements. From this discussion, the teacher and the students should then establish guidelines for the creation of an instructional manual for the project or activity that the students will construct. The elements at right could be used as a guide for the teacher in this activity. ©

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Fig. 2—Elements of an instruction manual

Manual Cover—1 page

Color artwork
Product

Introduction to Product—1 page

How product works
Purpose of product
How to use the manual
Thanks to consumer for purchase

Product Features—1 page

Description of product
Description of features

Safety Procedures—1/3 page

Steps on safe product use
Precautions

Parts and Functions Diagram—1 page

Diagram (line art) of product
Parts and functions labels

Troubleshooting—1/3 page

Problems that may occur
How to repair

Disposal Procedures—1/3 page

Safe disposal procedures

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