WHO?
WHY?
WHAT?
WHEN?
HOW?
Adapting Graphics For Various Audiences

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"The objects that our eyes see do not exist for us unless the mind is engaged. Only the mind can identify, interpret, and understand what the eye sees. But, the eye is only one of the sensory receptors. When the mind is dormant, not only do we look without seeing, we also hear without relishing, smell without savoring. All of the sensory impressions impinge on the mind, waiting to be assimilated, compared, recalled." (Hammet, 1975)

When we design graphics, our purpose is to engage the minds of our audiences so they will "identify, interpret, and understand what the eye sees." Given the plethora of visual stimuli that surround us, the task the writer and artist face in developing graphics (for printed materials) that will engage the mind is often a difficult one. With increasing frequency educational institutions, businesses, industries, and government agencies are relying on visual media for instruction and training. Willard Thomas estimates that one of every two tapes made by business, industry, and government is a technical message, and about 30,000 are produced every year. Television, slide tape and video cassette presentations, computers, teleconferencing, and demonstrations followed by practical experience have replaced many of the printed materials we relied on in the past. We are becoming accustomed to visual presentations that give us information in a palatable context, which we can quickly and easily assimilate. Preparation time, cost, flexibility, and distribution are some of the factors affecting the shift in media use. There can be little question that the innovations in all types of electronic media have had considerable impact on our use of and response to printed materials. Hayakawa has suggested that perhaps printed materials are destined to become supplemental rather than a primary means of communication. That may, indeed, happen. But man's record of discovery and development will continue to be preserved, whether in print, on film, or in computers. Before words and graphics can be stored in any form, they must be written and designed. It is unlikely that the electronic media will replace our scribal and graphic arts in the near future, but during this transitional period, they may inspire us to improve their quality.

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Graphics In Technical Writing Classes

I am not a graphics or visual specialist, nor do I teach any courses on preparing graphics. It would be presumptuous of me to imply expertise in this area. My major responsibility is to work with students enrolled in technical writing courses. However, discovering why, when, and how to use graphics for various audiences is an important aspect of technical communication. Therefore, it is important that we help our students, our future professionals, understand some of the general principles and standards that are used to make decisions on how to integrate graphics with a text.

In the initial planning stage of a writing project, two questions must be answered before any writing is begun, or before there can be any consideration of appropriate graphics. We all know these questions are:

1. What is the purpose of this message?
2. For whom is the message intended?

Next, a concept must be developed. That is, what is the best way to achieve the intended purpose for the specified audience?

Early in this planning stage, the writer should consult with a graphics specialist. In the educational environment, it is advisable to invite the specialist into the classroom to work with students in an informal session or two. Briles and Jacobshagen (1979), writing about ways to improve communication between artists and writers say, "the writer and artist must work together from the planning stage until the project is completed." They need to learn how to communicate necessary information to each other. For example, the artist needs to know the subject and purpose of the written materials and for whom they are intended. He may want an abstract of the document or a written description of the subject which points out unique characteristics that should be emphasized. Too often, **after** a report has been written, a writer makes arbitrary decisions about the types of graphics to include. The writer then presents the artist with a conventional table, a diagram, or some other graphic that would be inappropriate, or worse, incomprehensible to the reader. The artist should have the opportunity, early in the planning stage, to elicit information from the writer, and the writer should listen, with an open mind, to the artist's suggestions.

In the classroom, the student writer will usually design his own graphics. Because of limited experience and lack of confidence, the student is often uncomfortable with the idea of designing graphics. He can benefit substantially from the opportunity to consult with an expert. The expert can quickly demonstrate how to present data that will elucidate and support special kinds of information that will show the novice how to design attractive,

useful graphics. Gary Smook (1974), an engineer with MacMillan Bloedel Ltd., says, "Most technical writers are guilty of relying on a few dependable methods of illustrating their reports. When possible, be adventurous about presenting information! The fact that certain data have been depicted in a certain way for years does not make them sacred. If there is a better way, use it." Giving students the opportunity to work with graphic specialists and encouraging them to incorporate graphics into various classroom projects should help them develop some flexibility and creativity. Though we do not expect the students to become graphic artists, we may help them become more aware of what is possible and why.

Why We Use Graphics

Illustrations, as we all know, should be used to convey information quickly and accurately, to clarify, support, reinforce, show relationships, comparisons, or to add aesthetic value to written materials. At their best they provide an important link between the printed word and comprehension of a message.

While it is true that graphics need to be adapted to various audiences, there are certain principles that apply for all graphics for all audiences. The information must be relevant, the design should be clear and simple, the graphic should be easy to read, and it should contain an appropriate amount of information.

To be relevant, a graphic must have something to say that is useful, that serves the purpose of the article. In a technical report, for instance, no purpose is served by including a graphic that is peripheral to the content. On the other hand, when technical or scientific information is presented to lay readers, it may be useful to include attractive graphics that will help maintain interest, even though the graphics are peripheral to the message. Photographs, for example, are frequently used in publications for lay audiences, but they may not be suitable for technical reports because they often include too many unimportant features.

To say a graphic should be simple and uncluttered does not imply that it should exclude vital information. Eugene Guccione (1974), writing about preparing better flow-sheets, demonstrates that careful revision can result in a simpler, more readable design that includes all the relevant information but excludes unnecessary details and excessive data.

To present information accurately and concisely, a graphic should be easily comprehended. The words, numbers, and symbols should be recognizable so a reader can interpret them quickly. In many scientific and technical fields, conventional pictorial symbols that carry the same meaning for people in that field have been developed. Engineers suggest that if there are no conventional symbols to denote certain meanings, they should be created. Engineers consider pictorial symbols especially useful because the symbols communicate a concept, not a photographic image. Engineers also suggest more attention should be paid to the effective use of space, line, and color, and even to the kind of paper on which a graphic is drawn, since it may influence the quality of reproduction, which in turn will affect readability.

One of the main reasons why we use graphics, rather than words, is because graphics can present a great deal of information in a relatively small space. They can convey major ideas about how something looks or functions. They show statistical data, trends, sequential steps in a process, or the relationship of parts to a whole. We know that, generally, material that is seen is remembered better than material that is just heard or read. However, as mentioned before, many graphics are cluttered, show extraneous details, or give excessive data. In other words, they include too many unimportant features.

Theories and Principles

More and more illustrative materials are being used in publications, partly because of the visual media influence and partly as a result of the application of realism theories developed in the 1940's and 50's. The basic assumption common to these theories is that learning is more complete as the number of cues in the learning situation increases. However, a considerable amount of literature available suggests that an increase in the amount of information presented in a graphic will not add proportionally to the amount of learning achieved. In fact, some types of graphics may impede learning rather than facilitate it. Through indiscriminate use, information can be distorted and misleading.

There is often a communication problem among individuals who have had limited opportunities for sharing identical concrete experiences. Very little research has been done to identify the characteristics of visual illustrations, used singly or in various combinations, that are instrumental in significantly increasing learning. "The response that each of us has to anything at all is conditioned by the individuality of our education and experiences" (Hammet, 1975). When designing graphics, then, we must keep in mind that different readers may get a message different from the one intended, so a graphic may be nonfunctional as far as facilitating acquisition of information. A graphic may contain too little or too much information. If there is too little, the reader may be disinterested or bored, and the mind will lie dormant. If there is too much, the reader may be overwhelmed and the mind will refuse to interact. Or, a reader may respond randomly to whatever stimulus attracts his attention and fail to see the relationships among the stimuli. Conversely, a reader may group stimuli into broad categories and miss the relevance of individual stimuli. If the graphics do not have a high correlation with the message they are designed to support, they may simply confuse the reader. Or, in the case of an educational objective, the irrelevant graphic may prevent a reader from learning some information that is vital to subsequent learning. Much of the difficulty evolves from the assumption that people will see the same thing and learn in the same way.

A related problem results from limitations on the ability of the human mind to process information. Although humans have demonstrated the ability to learn from a variety of media techniques and strategies, it is generally agreed that they have a limited information processing capacity. This means that just increasing the amount of information will not necessarily increase learning or understanding. If too many visual stimuli are added to a graphic or the reason for their inclusion is unclear, people may have difficulty sorting out the relevant cues. If cues can be added that support, clarify, and enhance the text, then learning can occur. However, if the additional graphic cues are interpreted as excessive or irrelevant, the information processing system may perceive the cues as overload, and the system may malfunction in the sense that the information is distorted, misinterpreted, or simply not processed.

Conclusion

It should be evident that there is no formula for adapting graphics for various audiences. Each decision should be made only after a careful assessment of why a particular concept is being presented in a specific context to engage the minds of a particular audience. "The objects that our eyes see do not exist for us unless the mind is engaged." (Hammet, 1975)

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1981 NACTA Invitational Judging Conference At Fort Hays State University

Fort Hays State University at Hays, Kansas, is hosting the 1981 NACTA Invitational Judging Conference April 24 to 26. The invitational judging contests are open to all technical colleges, junior colleges, and non-land grant colleges and universities. Land grant colleges and universities may participate on an unofficial basis. The contest schedule includes General Livestock, Live Animal Evaluation, Horses, Dairy, Crops, and Soils Judging, in both two year and four year divisions. For more information contact Ron Lane or Garry Brower at Fort Hays State University, Hays, KS 67601 (913-628-4366). Confirmation of participation is requested by March 15, 1981.

CONSTITUTION OF THE NACTA INVITATIONAL LIVESTOCK, DAIRY AND SOILS JUDGING CONFERENCE

(As revised at Wooster, Ohio, on April 26, 1980)

ARTICLE I — The name

Section 1. The name of the conference shall be the NACTA Invitational Livestock, Dairy and Soils Judging Conference.

ARTICLE II — Team Qualifications

Section 1. Teams may participate from any junior college, technical college or university. Land grant colleges may participate on an unofficial basis but the mechanics of cost of participants and the inclusion of oral reasons shall be at the discretion of the host school.

Section 2. Team members must be currently enrolled in school and agriculture majors or agriculture minors doing undergraduate study.

Section 3. An active contestant may participate only once in each of the contests as a junior college student and only once in each of the contests as a senior college student, but must not compete in the Livestock, Dairy and Soils contest the same year. An active contestant shall be one who is entered as an official contestant.

Section 4. Contestants for senior institutions must have completed one semester or quarter of college work and be in good standing with that college.

Section 5. The livestock team will consist of five (5) judges who will judge and give reasons. The four (4) high scores will be used in determining the team score.

The dairy team will consist of four (4) judges who will judge and give reasons. The three (3) high scores will be used in determining the team score.

The soils team will consist of four (4) judges. The three (3) high scores will be used in tabulating team scores.

ARTICLE III — Registration Fee

Section 1. Registration fee shall be at the discretion of the host school, but the recommended Registration Fee is five dollars ($5.00) per contestant per contest. The host school shall be responsible for collecting and handling all fees.