Q&A: What's the Big Deal with Graphic Organizers?

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Teachers in gifted education for many years have been "watering-up" the curriculum for their students through enrichment. Here, the goal is for students to grapple with core ideas of the content and develop sophisticated relational understandings of it. They often engage in a variety of analytical, critical, creative thinking and problem solving activities to further develop cognitive skills. Moreover, in lieu of stressing the memorizing of facts, the emphasis is often on developing students who are skilled at processing information (e.g., finding and making sense of information, recognizing "core ideas" and discriminating essential from non-essential details, recognizing the structure of information, using information to solve problems, effectively communicating information to others). In addition, these students often receive a curriculum where instruction in effective and efficient learning strategies is integrated into the on-going content (e.g., social studies, literature, etc.) instruction. ***Arguably, all students (not just those with special gifts and talents) need to develop cognitive skills and thus should receive a "watered-up" curriculum.***

This article addresses the following most common questions teachers ask about graphic organizers

What are graphic organizers?

Isn't this just putting information into little boxes?

Are there different types of graphic organizers?

Is there research supporting use of graphic organizers?

Do graphic organizers raise test-scores?

Who benefits from graphic organizers -- aren't they for visual learners?

Isn't this harder that it looks?

When should graphic organizers be used?

How do I make time to use graphic organizers and still teach everything I need to?

Do I construct the graphic organizers or do students?

Won't students get tired of graphic organizers?

Can graphic organizers be used to assess students?

Many of the principles expressed in Theodore Sizer's *Coalition of Essential Schools*, Newmann and Wehlage's Standards *of Authentic Instruction*, Deshler and Schumaker's *Content Enhancement Model, and* Ellis' *Integrative Strategies Instructional Model* can be found in a watered-up curriculum. In addition, you may also find that Steven Glenn's ideas about *Raising Capable Children* have heavily influenced this vision.

What are graphic organizers?

Graphic organizers are communication devices that show the organization or structure of concepts as well as relationships between concepts. Spatial arrangements depicting the information's structure **reduce the cognitive demands on the learner.** The learner does not have to process as much semantic information to understand the information. This is one of the reasons why graphic organizers are such powerful devices for students with language-based learning disabilities. \

Why use graphic organizers?

There are three compelling reasons why you should use graphic organizers. First, students are considerably more likely to understand and remember the content subject you are teaching.

Simply put, the information tends to be less "fuzzy" and more precise. Graphics help students separate what is important to know from what might be interesting, but not essential information.

Second, because the semantic information processing demands are reduced, you can often address the content at more sophisticated or complex levels; this is especially true for many students with learning disabilities. Showing (as opposed to just telling) how the information is structured can be a powerful way to facilitate understanding.

Third, students are more likely to become strategic learners. Reading and writing skills, communication skills, and analytical, critical, and creative thinking skills are all subject to improve when students learn recognize these patterns of thinking, construct, and use graphic organizers.

Isn't this just putting information into little boxes?

Viewing graphic organizer instruction as just putting information into little boxes as analogous to viewing science fair projects as just creating pretty foldout posters. A science fair project involves a great deal more (e.g., researching the topic, conducting the experiment, determining how best organize and communicate results, etc.). Likewise, graphic organizer instruction involves a great deal more than what is readily apparent when just superficially viewing the results.

While information sometimes does get put into little boxes when graphic organizers are constructed, what is important to understand is the powerful nature of all the processes that occur both ***before*** and ***after*** the information is put into the boxes. Before the information is put into boxes, students have to engage in powerful information processing and higher order thinking skills such as using cues to recognize important information, making decisions about what is important or essential, consolidating information and identifying main ideas and supporting details, making decisions about the best way to structure the information, perspective taking of the consumers of the graphic so that it will effectively meet communication needs, and so forth.

After the information has been effectively organized on graphics, very powerful instructional higher order thinking activities can follow. Organizing information onto the graphics allows you to implement a variety of robust activities that otherwise might not be possible. For example, the organized information is conducive to a wide array activities involving in depth discussions, prioritization's of the information, elaboration's, debates, drawing conclusions, making connections to other ideas, making inferences, and extending students' understanding of important concepts, making decisions, proactive planning, and so forth.

Are there different types of graphic organizers?

Graphic organizers can be grouped into two categories: Those that depict the six basic information structures (whole-to-part, cause/effect, etc.) and those that serve specialized needs (i.e., a graphic which structures project planning, a graphic which structures goal setting, etc.).

There are a wide variety of designs for depicting the same basic information structures. For example, if you look through several different social studies texts, you will likely find a wide variety of compare/contrast graphics, each designed a little differently, but all serving the same basic purpose of visually revealing to students how the information is structured.

Graphic organizers depicting other information structures also come in a wide array of designs. For example, both the semantic web and the Whole-to-Part graphics depict a hierarchical information structure.

Is there research supporting use of graphic organizers?

There is an *extensive* body of research that supports the use of a variety of graphic organizers. In short, they can be effective when used in conjunction with a wide array of teaching styles, when teaching a wide array of subjects, and when developing literacy and cognitive skills of students.

One of the most appealing aspects of using graphic organizers is that they are universal in nature. That is, graphic organizers can be used to improve learning and performance of a wide array of students, ranging from those who may be intellectually gifted to those with mild learning problems.

The end of this chapter contains a list of selected works that address graphic organizer research. You will find articles that demonstrate their effectiveness for students whose capabilities range from gifted and talented to those with mild cognitive disabilities.*

Do graphic organizers raise test-scores?

Graphic organizers can contribute to increasing both classroom and achievement test scores. Naturally, the degree to which test scores are impacted by graphic organizers is relative to the degree to which they are effectively used and become an integral part of the on-going instruction.

Classroom test scores (i.e. weekly tests, unit tests) often improve for several reasons. First, the graphics help students understand and learn the subject. Second, they help students focus their energies on studying the essential information. Third, they serve as effective devices for helping students focus on the relationships between main ideas and details, main ideas and other main ideas, and so forth. Thus, the focus of study is how it all fits together rather than on just memorizing isolated, decontextualized bits of information.

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* *For more information about the effectiveness of graphic organizer instruction...*

Bergerud, D., Lovitt, T., & Horton, S. (1987). The effectiveness of textbook adaptations in life science for high school students with learning disabilities. Unpublished manuscript, The University of Washington.

Bulgren, J.A., Schumaker, J.B., & Deshler, D.D. (1988). Effectiveness of a concept teaching routine in enhancing the performance of LD students in secondary level mainstream classes. Learning Disability Quarterly, 11, 3-17.

Crank, J., & Bulgren, J. (1993). Visual depictions as information organizers for enhancing achievement of students with learning disabilities. Learning Disabilities Research and Practice, 8(3), 140-147.

Dansereau, D.F., & Holley, C.D. (1982). Development and evaluation of a text mapping strategy. In A. Flammer & W. Kintsch (Eds.), Discourse processing (pp.536-554).

Darch, C., Carnine, D., & Kameenuii, E. (1986). The role of graphic organizers and social structure in content area instruction. Journal of Reading Behavior. 28(4), 275-295.

Dunston, P.J. (1992). A Critique of graphic organizer research. Reading Research and Instruction. 31(2), 57-65.

Ellis, E.S. & Sabornie, E.J. (1990). Strategy based adaptive instruction in content area classes: Social validity of six options and implications for designing instructional materials . Teacher Education and Special Education. 13(2), 9-15.

Horton, S., Lovitt, T., & Bergerud, D. (1990). The effectiveness of graphic organizers for three classifications of secondary students in content-area classes. Journal of Learning Disabilities, 23(1), 12-22.

Howell, S.B. (1986). A study of the effectiveness of TOWER: The theme writing strategy. Unpublished masters thesis, University of Kansas, Lawrence.

Koran, M.L., & Koran, J. (1980). Interaction of learner characteristics with pictorial adjuncts in learning from science text. Journal of Research in Science Teaching, 1, 4-483.

Moore, D.W. & Readence, J.E. (1984). A quantitative and qualitative review of graphic organizer research. Journal of Educational Re 78(1), 11-17.

Moyer, J.C., Sowder, L., Threadgill-Sowder, J., & Moyer, M.B. (1984). Story problem formats: Drawn versus telegraphic. Journal for Research in Mathematics Education, 15, 342-351.

Schallert, D.L. (1980). The role of illustrations in reading comprehension. In R.J. Spiro, B.C. Bruce, & W.F. Brewer (Eds.), Theoretical issues in reading comprehension: perspectives from cognitive psychology, linguistics, artificial intelligence, and education. Hillsdale, NJ: Lawrence Erlbaum Associates.

Naturally, the degree to which graphics impact test scores will also be affected by the degree to which students are tested on the information depicted on the graphic. One teacher did a marvelous job of depicting complex information on a graphic and then helping students understand it, but then tested them using one of the commercial tests that accompanied her teacher's guide. This test addressed mostly esoteric facts that were not central to the ideas depicted on the graphic. You can guess what happened to her students' test scores!

For many students, improved performance on classroom tests will be almost immediate. However, improvement on standardized achievement tests is not immediate but is likely over time if sufficient emphasis is placed on teaching students how to use graphic organizers strategically.

Most readily apparent will be improved achievement scores in writing when students learn how to use graphics to structure their ideas during the pre-writing process. Reading comprehension scores may also improve because extended practice using graphics teaches students to be more aware of information structures and their semantic cues. Clearly, this knowledge and the skills to use it directly impacts reading comprehension. Thus, classroom activities, which require students to read to find essential information to depict on a graphic, can be a powerful way to improve literacy skills.

Viewing graphic organizers as part of an overall package of pedagogical tools and routines that improve test performance is important. Teachers who use graphic organizers effectively are also likely to be using a host of other effective teaching tools and routines concomitantly. Thus, use of graphic organizers should be viewed as ***part of a whole system of effective pedagogy.*** By themselves, they are not the answer to raising test scores.

Who benefits from graphic organizers -- aren't they for visual learners?

While it is true that some people seem to prefer visual presentations of information and others prefer auditory formats, viewing the learning process in this manner is a gross over-simplification of how information is actually processed and understood. In reality, the nature and complexity of the information being communicated, innate memory capacity, the quality of elaboration the learner applies when processing the information, and the existing background knowledge of the learner dictates the subsequent success of learning far more than one's intellectual aptitude for processing information via different presentation modes.

Although an in-depth analysis of this issue is beyond the scope of this article, there are several key ideas you should consider:

* In most cases, dual-presentation (visual representation accompanied by auditory explanation) is considerably more powerful than either approach alone, regardless of whether you believe the student is a visual or auditory learner.

* The proportion of students who greatly benefit from visual representations of information is extremely greater than those for whom these devices do not seem to provide much help.

* Of those students who experience difficulty understanding graphic organizers, the problem usually does not reside in an innate cognitive disability that prevents success. Rather, most of these students have not yet learned *how* to read and understand them, and they generally respond very positively when taught how to do this. Also, many graphics are poorly designed, thus may be confusing to students and interfere with learning.

Isn't this harder that it looks?

The answer to this question is "YES".... and "NO." If you are generally unfamiliar with using graphic organizers, your learning curve will be pretty steep at first. Not only do you have to learn how to make them work in your classroom, you'll also have to learn how to construct them yourself. Many teachers also have to learn how to make difficult decisions about the curriculum they are teaching (e.g., how to identify the "core idea" and focus on just essential details), and if you are unfamiliar with various cooperative-learning techniques, this can be a challenge as well. Clearly, using graphics is most difficult for teachers who are not familiar with the curriculum they are teaching. Thus, if you have to teach a unit on the Progressive Era of the United States and you don't know much about this era, then it will be more difficult to design graphic organizers about it.

Does all this sound discouraging? If it does, keep in mind that the more you use them, the easier it gets. T sounds like a tired old cliché, but it is nonetheless ***very*** true. Eventually, you may find that using them is actually ea and less demanding than techniques you currently are using. Also keep in mind that once you have constructed a graphic organizer to teach a particularly challenging topic, you can then re-use the graphic many times in the future Thus, an "up-front" initial investment in creating graphics organizers may result in considerably less work over the l run.

When should graphic organizers be used?

If you think of your content instruction as having a beginning, middle, and end, graphic organizers can be used during any of these segments. For example, they can be used to facilitate students' activation of background knowledge and to create anticipation for future learning at the beginning of a unit or even a specific lesson. They can be used as the new content is being explored. They can also be effective ways to facilitate review of previously taught materials.

Graphic organizers can also be used to teach processes and strategies. For example, you can incorporate them into guidelines for writing book reports, lab reports, social studies reports, etc. They can also be used to help students organize tasks and assignments.

How do I make time to use graphic organizers and still teach everything I need to?

When you first begin using graphics, you may feel like they require too much of your class time. Keep in mind the following:

When you first begin using graphics, your students' learning curve as well as your own will be steep. For many of your students, they are not only learning the content depicted on the graphic, they are also learning how to read the graphic itself. You will likely find that later, similar lessons require considerably less time because both you and your students have become familiar with the format.

Also keep in mind that less is more--depth is more. While it may seem like the graphic requires too much class time, remember that without it, your students are not as likely to readily understand or remember for very long the content you are teaching. You'll need to resist temptations to provide more content "coverage" at the expense of providing instruction that is meaningful. ***Few students will remember many of the details for very long anyway.***

Also remember that graphic organizers allow you to teach more than just the content. You are also teaching information processing skills, patterns for organizing information, analytical and critical thinking skills, as well as communication skills.

Do I construct the graphic organizers or do students?

The answer to this question is "YES" -- you both construct them. Ultimately students should learn to construct them themselves. A common mistake, however, is to create activities requiring them to construct graphics when you have not modeled or provided sufficient instruction in *how* to do this.

Generally, it is best to view the sequence of enabling students to construct graphics as a four-stage process (see figure below).

Four Stages for Enabling Students to Construct Graphic Organizers

Stage 1	Teacher does it	Teacher constructs the graphic organizer, provides students a copy, and uses it when teaching the content.
Stage 2	Class does it	Teacher and students co-construct graphic organizers depicting important ideas as the content is explored.
Stage 3	Groups do it	Teams of students construct graphic organizers via cooperative learning and the teacher acts as a guide-on-the-side.
Stage 4	Individuals do it	Students independently construct graphic organizers

Generally, Stage 1 "Teacher does it" is reserved for those times when an unfamiliar format is being used thus there is a need to explain and model the technique. Stage 1 is also used when teaching very complex information that otherwise would be difficult for students to understand if not presented graphically.

Won't students get tired of graphic organizers?

Many excellent teachers utilize a wide array techniques for enabling students to learn content. They are constantly introducing new activities, new projects, and new ways of conceptualizing the information to keep things interesting for students. Because there are so many types of graphic organizers, they typically use a wide array of them, and some never use the same graphic organizer format more than once with a particular group of students.

Keeping students stimulated by providing many different ways of learning the content generally is very good practice. It avoids getting into a rut and helps stave off that constantly lurking monster -- ***boredom***. There are, however, some important considerations associated with using a wide array of graphics.

Many teachers believe that exposing students to a wide array of graphics can only be beneficial with regard to developing thinking skills. While this may be true for some very bright students, the benefits of this practice are unclear and may even be negligible for many students. The

concern parallels a similar problem discussed earlier about content coverage and providing only superficial exposure to what should be learned.

For students to develop a depth of understanding about a specific information structure and organizer format, most need more than one exposure to it. Like most other skills that are of value, effective modeling, guided practice, and multiple practices in a wide array of applications are needed before students begin to internalize and truly understand the value of the device. As a general rule, most students need about 15 to 20 different meaningful exposures to a specific organizational structure before they really begin to understand and internalize it. This means that **the principle *of "less is more - depth is more"* applies to graphic organizers too.**

Thus, while good teachers try to provide a wide array of different learning opportunities, they also balance this against loosing effectiveness of their instruction by using too many different things. There is often a thin line between sticking with a particular device long enough for it to truly impact students abilities, and loosing student interest due to the *"been there -- done that"* mentality they may communicate in an effort to get you to increase the variety in your classroom.

While monitoring the pulse of the classroom with regard to levels of stimulation and interest is important, *effective* teachers also have sufficient confidence in their instruction and curriculum not to allow students' disparaging comments (i.e., *"Oh no, we have to do graphic organizers again?*") keep them from sticking with a skill long enough for the instruction to be effective.

Can graphic organizers be used to assess students?

Graphic organizers can be a very powerful tool for assessing students' (a) knowledge of the content (e.g., social studies, science), (b) thinking skills such as the ability to structure information, and (c) some habits of the mind such as creativity, and commitment to quality.

For example, having students construct a graphic organizer depicting their understanding of the core ideas of recent instruction and how they interrelate, and then orally explain their graphic as you observe and evaluate can reveal considerably more about what the student understands than paper and pencil tests will ever reveal. You can use a rubric to assess the depth of students' understanding of the content as evidenced by their graphic and explanation. Rubrics also can be used to evaluate the complexity of the students' graphic as an indicator of ability to organize and structure information as well as indices of creativity and quality.