Eye to eye: connecting with gifted visual-spatial learners (teaching strategies)

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For his third birthday, Matthew received his first set of LEGO[R] building blocks. While the adults around him happily followed the instructions, Matthew created his own elaborate and unique structures. At 23, after graduating from college, one of the necessities Matthew bought to furnish his first apartment was a large set of LEGO. In the 20 intervening years, Matthew both excelled in and struggled with school. Some researchers suggest that his spatial strengths and sequential weaknesses may be the reason for the extremes in his educational experience.

Gifted students such as Matthew have been described as having a visual-spatial approach to learning and may present a confusing scenario to teachers and parents (Silverman, 1989, 1997). The disparity between their learning approach and traditional teaching methods may prevent these children's strengths from being identified and nurtured. The United States educational system tends to favor sequential learners; high-ability children with strengths in the spatial aptitudes and weaknesses in the sequential realm may not be recognized as gifted learners. Successful adults who use this approach to learn tend to have careers in mathematics, science, computer technology, engineering, aeronautics, and the fine arts. Supportive environments, awareness of strengths and weaknesses, and some simple academic modifications may help these children become innovative leaders in society.

Strengths of Visual-Spatial Learners

Students labeled as visual-spatial learners are frequently adept at puzzles, mazes, reading maps, finding their way in unfamiliar territory, and creating visual images of locations and objects. Visual transformations, such as how the furniture in a room would look if it were rearranged, come easily. They can take almost anything apart and put it back together again in working order. Unfortunately, these skills are not valued often in today's educational system.

Children who are "LEGO-maniacs" are often visual-spatial learners. Construx[TM], K'nex[TM], and Tinker-Toys[TM] are favorite toys of these children, as are the boxes in which the toys are packaged. Visual-spatial learners rarely follow the directions, preferring instead to create their own designs. Computers are another of their chosen pastimes. If a teacher needs to know how to solve a computer technological glitch, ask a visual-spatial child and the situation may quickly be resolved. Many of these children have few toys intact because they are speculators at heart. They have a tendency to pull everything apart to figure out how it works.

These learners are reflective and need time to think. As a result, they frequently appear to be off task and day-dreaming. Highly creative, these children often create imaginary playmates who become a part of their lives. Remarkable imaginations find them making up vivid stories that they may have great difficulty putting into written form (Silverman, 1989b).

Organization is usually not a strength of this learner. Homework is regularly forgotten, clocks seem to have no meaning, desks look as if they have been ransacked. There appears to be an unwillingness to conform to schedules and routines. Cleaning their rooms may overwhelm these children and seem like an insurmountable task.

Sensitive and emotional, these children may call your bluff. They are very good at reading people and sensing ambivalence and anxiety. Also physically sensitive, they may "over-react" to their environment: itchy clothes, unanticipated noise, and visual stimulation. Hypersensitivity also causes these children to be reluctant risk takers (Silverman & Freed, 1991; Sword, 1997).

Academically, these learners appear to struggle with easy concepts but thrive on complexity (Baum, 1984). Math computation may be laborious, but abstract math concepts are easy for them to comprehend. Reading aloud may be arduous with little comprehension of content, while reading silently may result in a high level of understanding. These children often arrive at surprising conclusions and keep you guessing what their next response will be. Their struggles with "simple" concepts send conflicting messages to teachers and parents who have listened to their elaborate stories and explanations.

Sequential vs. Spatial

The American educational system is structured sequentially, putting the student with a strong spatial inclination "at odds" with the system. There is a mismatch between the way the child is taught and the way the child processes information. Through her extensive work with highly gifted learners, Silverman (1997) developed a list of characteristics, which contrasts sequential (i.e., deductive) and spatial (i.e., inductive) learners (see Table 1).

Strategies for Teaching

To be successful in school, students with a visual-spatial approach to learning may need to have their strengths recognized and nurtured. "For these people, it is sometimes far easier to learn firsthand from nature than it is to learn secondhand from books," (West, 1997, p. 12). Increasing the level of difficulty, encouraging visualization, teaching holistically, using humor, color, mnemonics, and manipulatives are methods that may be successfully used with these learners.

General Strategies

"Visual-spatial learners need a Gestalt approach to learning. They do best when they deal with whole systems, abstract relationships, major concepts, inductive learning, and problem solving" (Silverman, 1989b, p. 18). They have difficulty attending to details and don't understand if learning opportunities are provided in small chunks. Give these children "the big picture" at the beginning of each unit or activity and explain major concepts so the child understands the instructional goal. With the concept, the frame of the puzzle, in place, the child may then start fitting in the pieces to create a complete picture. Interdisciplinary units are a favorite of these learners who easily make connections between the disciplines. Real-life scenarios and service-oriented projects are excellent opportunities for visual-spatial learners to demonstrate their strengths.

"A-ha" describes the way that these learners acquire new information. These children may either totally understand a concept or understand nothing about it. Difficulty explaining the steps of their thinking may be due to their holistic processing. Once the "A-ha" occurs, learning is relatively permanent. Because of this, and the fact that they may not learn by rote memorization, visual-spatial learners detest routine and repetitive tasks (Silverman, 1989c). Allowing opportunities for inductive learning, where the child might discover the content or method, is a highly effective strategy. An effective method that has been used with gifted learners, is to tell them the goal of the instruction and allow them to figure out a way to achieve the goal. Teachers may provide challenges by stressing proficiency in higher level concepts instead of perfection of simpler skills.

Meaningful Material

Make the material personal, and the "A-ha" may occur much sooner. For example, Matthew is now learning more history than he ever did in school through his participation in Society for Creative Anachronism, an international organization dedicated to researching and recreating pre-17th-century European history. A reenactment or simulation places the child in a role-playing situation, which is ideal for visual-spatial learners. Familiar analogies also help the spatial child make connections. Real world problem solving is ideal for these children.

During Lectures

Lectures may be difficult for visual-spatial learners because' of the time it takes to translate the spoken word into pictures (West, 1997). Because of the spatial child's possible need for processing time, it is logical to conclude that pauses built into the lecture would allow the spoken words to register. Drawing diagrams, using graphic organizers, and taking notes in pictorial format may help the child to recall the information more effectively. Lectures may be tape recorded, thus providing the opportunity to replay the lecture as necessary. Emphasizing concepts over details, such as dates of battles and lists of geographical locations, help these students to get the whole picture. Best of all, handouts might be distributed since the spatial learner has difficulty taking dictation.

Foreign Language

Classroom instruction in foreign languages may be daunting due to the tendency for visual-spatial learners to have difficulty with spelling (Silverman, 1989c). For example, Shana failed Spanish in high school yet was the first one in a group that traveled to Mexico to comprehend the language. For visual-spatial learners, total immersion in a language is much more effective than learning in a classroom setting.

Math

"I don't belong here," Laura announced when she arrived for her accelerated math class in fifth grade. She was convinced that her placement in the group was inappropriate because she did poorly on timed math tests. She did not consider the fact that she had placed fourth in the school on Continental Math League[TM] to be an important factor in her placement. By the end of fifth grade, Laura was excelling at sixth-grade math concepts, but she still processed her multiplication facts slowly. In seventh grade, Laura was back asking to be tutored in algebra. Laura, a visual-spatial learner, did not need to be taught the algebra.

She could explain it better than her tutor; her poor grades came from not writing down every step of every problem as her highly sequential teacher insisted she do.

Timed tests, drill and repetition cause many visual-spatial learners to believe they are poor mathematicians (Silverman, 1989b). Math might be taught within the context of the entire number system. Looking for patterns in math such as 5678 or 56 = 7 x 8 and 4 x 9 = 6 x 6 may help with the retention of basic facts. Any opportunity to devise their own method of problem solving is beneficial. For example, when teaching division, a spatial learner may need the divisor, the dividend, and the quotient and then may need to be allowed to figure out how division works. When using worksheets, ask the child to do the five hardest problems on the page neatly and with 80% accuracy; if this is accomplished then the student does not have to complete the remainder of the page. This reduced number is sufficient to prove mastery and eliminates the repetitive aspect of the task.

Organizational Skills

Kaylee, a highly creative fourth grader who struggled to read, could not bear to see her mother throw anything away. Every plastic fruit tray and paper towel roll possessed endless possibilities. As a result, Kaylee's bedroom at home and desk at school looked as though they had been ransacked. A visual-spatial child's organizational strategies often appear non-existent (Silverman & Freed, 1991). Their creed might well be, "to file is to pile."

As a child progresses through school, the number of books and supplies increases. A parent or teacher might use the visual-spatial learner's preference for color to coordinate materials. When worksheets and study guides are copied on colored paper, it is easier to keep organized and easier on the eyes. Subjects may be coordinated in different colors--for example, the math text might be covered in blue with a blue math portfolio, spiral, binder or whatever other supplies are necessary. With a different color assigned for each subject; this child may go to her locker and grab everything that is red or purple for the next class. Highlighters and assignment books or calendars go very well together. Each subject may be assigned a different color, or long-term assignments may be highlighted in one color and short-term assignments in another. Teach students how to create priority lists and schedules--they may not like it, but it is an essential survival skill. As for Kaylee's bedroom, looking at the entire room was overwhelming so she would throw a hoola hoop into the room and clean the portion of the room in which it landed. Toss by toss the room got cleaner and cleaner.

Lack of a concept of time may impact the organization of a child with a visual-spatial approach to learning. Garrett's parents and teacher often found him gazing into space reflecting on the world. Garrett had the ability to complete his work very quickly but did not seem to realize that time was passing as he pondered his latest creation. A three-minute egg timer proved useful to help him grasp a concept of the passage of time. Initially the timer was placed on his desk, and he was given a goal (five problems in the time it takes for the sand to fall). Gradually, Garrett took ownership of the timer and would set his own goals. These learners also benefit from having reliable watches, preferably one with an alarm. Asked how he was able to keep himself organized once he got to college, a highly visual-spatial young man said, "Be involved in so many activities that your life is scheduled for you!"

Teacher-Student Interaction

The relationship a teacher builds with a child with a visual-spatial approach to learning is crucial to the child's success in school. Being highly sensitive, a teacher should set a positive tone and discipline him or her in private. Negative messages may result in an emotional shut down and therefore, an absence of learning.

Suggest some strategies for using the learner's visual strength to develop an awareness of what is happening in the classroom. Teach the student to take clues from classmates. Just make sure he or she is observing the right student, some are better role models than others!

Institute a moment of silence at the end of class or the end of the school day so students may visualize what they may need for homework. Have them take a few deep breaths, close their eyes, and relax; then visualize what happened during the day and what will be needed for homework.

Michael was working with his algebra tutor and was responding to her question with a very lengthy explanation. She almost stopped him half way through his answer because he was clearly headed in the wrong direction. Resisting the temptation, she was amazed as she heard him turn his reasoning completely around and end with an accurate explanation of the process. Finding this a continuing pattern, one day she asked him if any of his teachers ever cut him off in mid-sentence. Michael replied, "Oh, all the time. I just don't even put my hand up anymore." Often times, visual-spatial learners understand the concept but struggle to explain it. Many visual-spatial children may start down the wrong path when answering a question but by the end of their response, they have done an about face and responded correctly. The spoken word actually gets in the way of their thinking, and it takes time to go through the verbal to visual translation process. Let the child completely finish answering the question even if he appears off target. Also, allow significant wait time for visual-spatial learners. They may need time to translate the spoken word to images. It may take a visual-spatial child longer to begin to answer the question than it took you to ask it.

Most importantly, encourage the child's strengths; don't dwell on the weaknesses. This positive approach may be difficult for gifted learners' with this learning style for they may exhibit their greatest abilities outside of the traditional educational system. However, they have strengths in areas that are often highly valued by society: creativity, ingenuity, and adaptability. Believe in these children, they may well be the future Edisons and Einsteins of the world.

Table 1
Characteristics of Sequential and Spatial Learners

Sequential	Spatial
Profoundly influenced by time	Preoccupied with space
Western thought	Eastern thought
Step-by-step	Whole to part
Learn by trial and error	Learns concept all at once
Analytical thinker	Systems thinker
Computation	Concepts
Follows oral directions	Follows visual directions
Phonics	Sight words
Rapid processor	Slow processor
Good organization	Organizationally impaired

Progresses from easy to difficult	Gets difficult concepts, struggles with easy
Needs repetition	Learning sticks
Does well with algebra	Does well with geometry
Deductive	Inductive
Analysis	Synthesis
Orderly progression	Intuitive grasp
Academic talent	Technology/creative talent
Early bloomer	Late bloomer

Note. From Effective techniques for teaching highly gifted visual-spatial learners, by L. K. Silverman, 1997. Retrieved August 15, 1997, from the World Wide Web: http://www.gifted development.com/Articles/EffectiveTechniques.html

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