Changing Learning Channels:
An Efficient Strategy to Facilitate Instruction and Learning

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Teachers use sensory inputs and physical outputs to define learning channels that students use during specific instruction. For instructional purposes, teachers arrange the sensory inputs and physical outputs on a grid to form a learning channel matrix. We present three examples of learning channel matrices in this article. Teachers may facilitate planning, enhance communication with students and parents, and encourage diversifying instructional activities when they use a learning channel matrix to actively guide their instruction.

Teachers strive to promote meaningful learning and the application of instructional content. Carefully planned and explicitly stated instruction often facilitates learning and application. For example, a teacher may identify a particular performance objective such as "Joan will spell 9 out of 10 consonant-vowel-consonant (CVC) words correctly." This simple objective seems to communicate student expectations and performance. The objective represents only part of the picture, however. Adding a learning channel to this objective will make a clearer and more carefully planned instructional objective.

Teachers use sensory input and physical outputs to define learning channels. For example, a teacher could use the see-to-write learning channel for spelling CVC words. Think-to-write CVC words and hear-to-say spelling of CVC words provide other examples of learning channels. With these examples, the students see the word and then write the word, think the word and then write the word, hear the word and then orally spell the word. Because each performance constitutes a different behavior, each requires a learning channel.

HAUGHTON'S MATRICES

Haughton (1980) helped teachers by improving the procedures for selecting learning channels. He identified several learning channel sets and organized the sets as a matrix. In the sensory input category, Haughton's matrix included thinking, touching, tasting, sniffing, seeing, hearing, and feeling. The physical outputs on his matrix consisted of aiming (e.g., directing an object or body part to an answer); doing (e.g., performing some activity); drawing or emoting (e.g., physically expressing an emotion); marking, matching, saying, selecting, tapping (e.g., using computer mouse, tapping answers to math facts); thinking and writing. These inputs and outputs can jointly describe almost all the ways students can receive information and respond to that information. Figure 1 shows Haughton's academic/personal/social development matrix.

Haughton constructed two other matrices besides the one displayed in Figure 1. The first, a mobility matrix featured thinking, touching, tasting, sniffing, seeing, hearing, and feeling for the inputs, and rolling, creeping, crawling, scooting, cruising, walking, running, galloping, hopping, jumping, leaping, slipping, and sliding for the outputs. The second, an activity matrix, also featured the thinking, touching, tasting, sniffing, seeing, hearing, and feeling inputs, but featured waving, aiming, tapping,

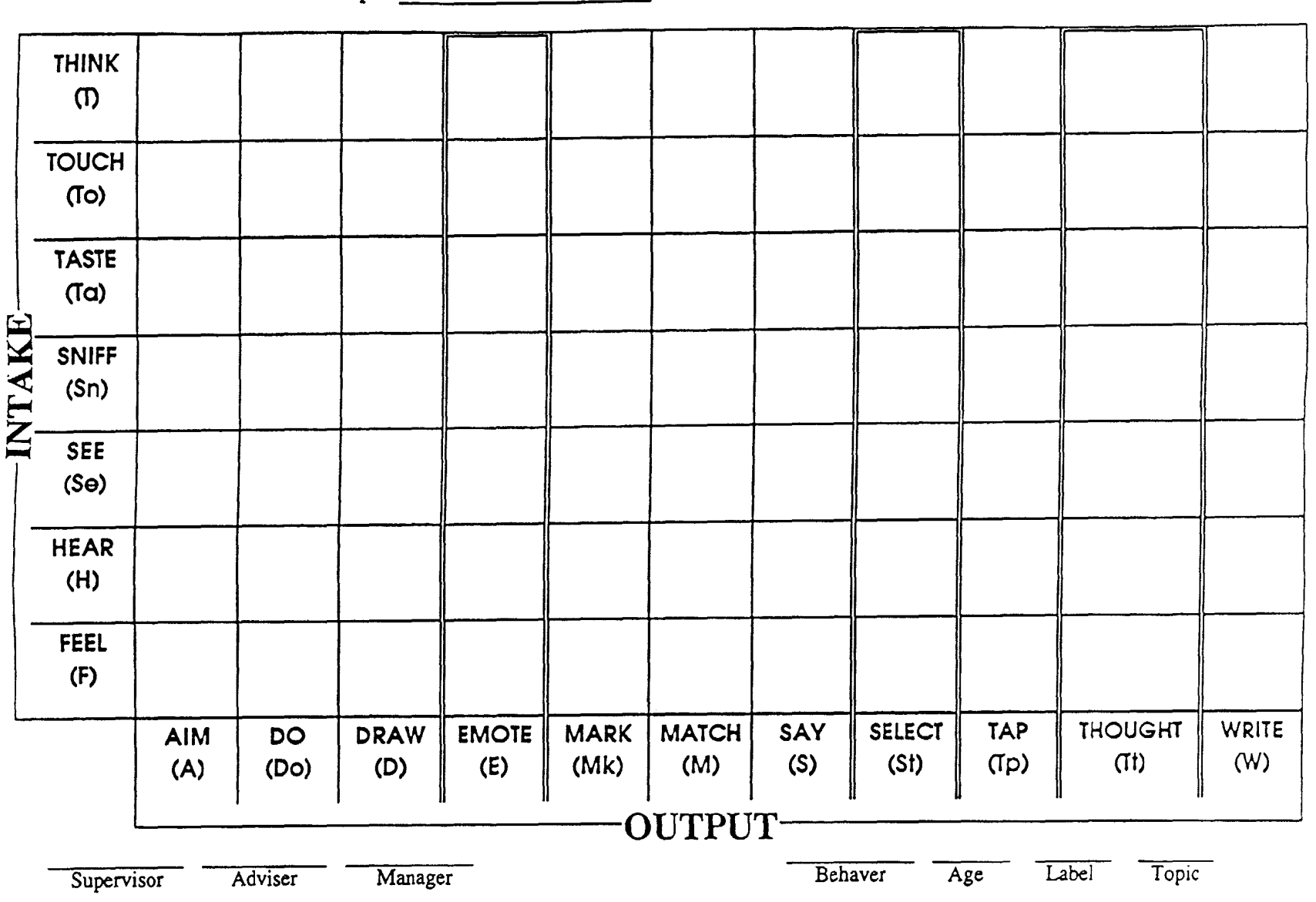

Figure 1. *Haughton's academic personal social matrix. Adapted from Haughton learning material, by E. Haughton, 1996, Napa, CA: Haughton Learning Center. Copyright 1996 by Elizabeth Haughton. Adapted with permission.*

squeezing, getting, pumping, rubbing, shaking, and twisting as outputs. The activity and mobility matrices appear visually similar to the academic/personal/social development matrix except that the outputs differ.

In school settings, the academic/personal/social development matrix is most often used with academic instruction of students who are typically developing or mildly disabled. The activity matrix and the mobility matrix, however, work better with instruction aimed at students with severe disabilities because of the outputs. Students with typically developing or mildly disabled repertoires can easily make use of those forms of expression (e.g., aiming, doing, drawing, emoting, marking, matching, saying, selecting, tapping, thinking, and writing). Students with severe disabilities may not have the previously mentioned outputs at their disposal and will profit more from the other outputs. All three of the matrices cover the full range of academic events and every type of student capable of benefiting from instruction.

How to Use a Matrix

First the teacher identifies one, or two, or a large group of learners he or she wishes to instruct. The characteristics of the group will bear on selecting the appropriate matrix (i.e., generally students typically developing or mildly disabled will use the academic/personal/social development matrix, and students with severe disabilities will use the activity matrix and the mobility matrix). The following steps will guide the teacher through using any of the matrices.

- Identify the target performance and write it on a separate sheet of paper (e.g., spelling cue words, recalling information units).
- Underneath the target performance, write a list of all the different ways to arrange instruction (e.g., rhyming words, blending words, segmenting words).
- After generating a list, write the input and output next to each instructional activity.
- From the list, pick the first instructional activity and find the same input and output on the learning channel matrix (e.g., see problem, say answer). From the input, move to the right, and from the output, move upward until the two intersect. Enter the instructional activity in the cell.
- Follow the previous step for entering all desired instructional activities in the cells.
- After entering the instructional activities on the chart, review the pattern that appears.

Figure 2 shows a teacher-made matrix, adapted from the Haughton Learning Center (Haughton, 1996), which was made after the teacher had followed the steps for using a learning channel matrix.

Now, the teacher can engage in a critical analysis. For instance, the instructional activities chosen for the learners may all fall in one or two rows such as "see" or "hear." Or the pattern may resemble a scatter plot with a variety of instructional activities to choose from. Either possibility will give the teacher a visual display, and a record, of the range of instructional activities provided for students. This facilitates planning for continuation or revision of selected learning channels.

Why Use Learning Channels?

Arranging instruction so that it becomes enjoyable, exciting, and capable of making a difference for students calls for a careful analysis of students' unique educational needs. By employing learning channels, any teacher can provide systematic, precise, individual, and thoughtful instruction. The following seven points highlight the need for learning channels.

1. *Using multiple learning channels with the same target performance will add variety to instruction and practice.* When instruction is varied, the learner will experience different ways of learning. Kameenui and Simmons (1990) discussed the benefits of changing response modalities during instruction: "By alternating response modes, teachers can prevent overuse of a particular response form . . . , increase learner attention to task, and actually minimize failure by attending to features of the response mode" (p. 35).

Teaching a history lesson provides an illustrative example of the benefits of using learning channels to add variety to instruction and practice. A common manner of delivering instruction involves the teacher speaking and the students taking notes or just listening—a hear/write or a hear/think channel, respectively. Some ways to vary the response forms to include other activities might involve hearing part of the lesson and then acting it out in a skit—a hear/do channel. Or perhaps the students read part of the lesson and explain it to other students—a see/say channel. Or maybe students feel props from a lesson (e.g., an arrowhead) and then draw ways people once used it—a feel/draw channel. Adding this variety of learning channels during instruction and practice will stimulate learning; it may also prevent boredom and help maintain motivation.

2. *Extending skill applications by teaching and practicing many exemplars of the skill area.* In Stokes and Baer's (1977) landmark article on generalization, they drew attention to the importance of teaching many examples. They expressed an important, and often overlooked, point: If we teach a student one exemplar, the student will be able to master one exemplar. Any generalization that occurs beyond the one exemplar taught falls in the domain of "train and hope." So, teaching a child how to greet another student with only one teaching example

ACADEMIC-PERSONAL-SOCIAL MATRIX

	AIM (A)	DO (D)	DRAW (D)	EMOTE (E)	MARK (Mk)	MATCH (M)	SAY (S)	SELECT (St)	TAP (Tp)	THOUG-HT (Tt)	WRITE (W)
THINK (T)		Equations with objects	Pictures for equations			Answers and equations	Answers to story problems				#'s in sequence ~ equations for #'s
TOUCH (To)											
TASTE (Ta)											
SNIFF (Sn)											
SEE (Se)		Wrap ups	Pictures for equations		Numbers by 2's, 3's 4's, etc.	Answers to problems	Answers to problems	correct answers		Math 36 4 △ 9	Answers to problems
HEAR (H)		Objects for equations	pictures for equations			Answers to problems	Equations for story problems	Answers to problems given		Music x tape	Facts from mult. Rock
FEEL (F)											

← Assessment

Student: Amy Jones **Class:** 3rd Grade Math **Subject:** Multiplication **Goals:** Fluent calculations

Notes: Amy really likes doing the Se/Tt exercises. Will provide more examples and have Amy make up some of her own homework. Have her practice more in the T/W channel.

Figure 2. *A teacher-made learning channel matrix. Adapted from the Haughton Learning Center. Adapted from Haughton learning material, by E. Haughton, 1996, Napa, CA: Haughton Learning Center. Copyright 1996 by Elizabeth Haughton. Adapted with permission.*

functionally means that the student can master only the one type of greeting response. Teachers should not expect or "train" the one example "and hope" that it will generalize to other people, settings, or behaviors.

Tiemann and Markle (1990) have also suggested the importance of arranging multiple examples when teaching concepts. They stressed the significance of systematically presenting examples and nonexamples. For instance, teaching the concept of green with a green ball, a green crayon, and a green toy provides more than one example, but the student may call a blue car "green" because he or she did not experience the boundaries of green by learning nonexamples.

Learning channel users can guard against the pitfalls from both the "train and hope" approach to generalization and instruction that promotes deficient concept formation. First, by virtue of experiencing multiple channel presentations, the student will automatically experience more than one example (e.g., sees a person and says hello, hears a person give a greeting and says a return greeting, sees a person and thinks of ways to say hello). Second, by planning which examples and nonexamples to present (see Tiemann & Markle, 1990, for a detailed elaboration), the teacher can facilitate and explore a student's grasp of a concept (e.g., seeing a crayon box and selecting a green crayon, seeing a picture and marking green areas, thinking of green objects and writing about them).

3. *Facilitate planning for instruction and practice.* Most teachers probably consider the curriculum and subsequent goals during instructional planning. By filling in cells on the learning channel matrix with potential ways to instruct students, teachers empower themselves to organize varied and dynamic types of learning arrangements. The teacher can schedule more activities on underused inputs and outputs during practice sessions.

For instance, suppose that a teacher wishes to conduct a lesson on using appropriate punctuation. The teacher may type some sentences or paragraphs to display on an overhead and then demonstrate appropriate punctuation to the students. This instruction occurs on the see/hear channel for the students. For practice, the teacher gives the students worksheets with sentences and paragraphs missing punctuation. The students practicing this activity engage in a see/mark channel.

If the teacher had as an original objective teaching the students to use appropriate punctuation, the results will vary. Some students will undoubtedly deduce how to use punctuation when they write sentences or paragraphs from the exposure of the past lesson. But this ultimate goal, having students think/mark punctuation, may not happen for all the students because they cannot make the leap from the see/mark channel to the think/mark channel.

Using the learning channel matrix to include instruction and practice activities on the think, hear, and see channel will greatly extend the opportunities for all students to make the connection and perform the desired terminal skill. For example, the teacher can ask students to imagine a sentence that has quotation marks and a question mark—a think/mark activity. Or the students can listen to the teacher read aloud a sentence, saying where punctuation marks go—a hear/say activity.

Regardless the type of teacher (e.g., general or special education) who uses the learning channel matrices, a certain amount of time must go into generating and planning instruction and practice activities. The amount of up-front time the teacher puts in will depend on the instructional objective and the experience of the teacher. Although this may represent an "additional task," the benefits for increased and varied academic responding will ultimately outweigh any up-front time considerations.

4. *Communicating with others in plain English.* Students, teachers, administrators, parents, and other support personnel (e.g., school psychologists, nurses, doctors) have unique roles in the learning process. Frequently these people must talk to each other to share information regarding students' development in the learning environment. Thus, it becomes imperative that all can understand a common language for learning. Learning channels use plain English and present-tense words to describe how a student receives and responds to instruction. The use of plain English facilitates communication and makes use of words that have more meaning for people because they use these words often (Lindsley, 1991).

5. *Reminding us that students learn and respond in many ways* (McGreevy, 1983). The once-popular slogan "Different strokes for different folks" best captures the spirit of using learning channels. Whether a general education teacher has 30 students in a classroom, or a special education teacher delivers instruction to only 8 students, the common element in each class is the uniqueness of each student. In each classroom, the master teacher will discover and direct instruction and practice toward the unique characteristics of each student.

Just "knowing" a class of students will not allow teachers to sensitively make curricular or instructional adjustments. By using learning channels, teachers generate a record of best practices for groups and individual students. Perhaps the discovery of the type of individualization that students flourish under relates to what some researchers have called "learning preferences."

6. *Helping us select instructional and practice activities for learners with special needs.* (McGreevy, 1983). Students served by special education are a heterogeneous group of children. With such varied and distinct disabilities, each student will require instruction tailored to his or her specific educational needs. Using different channels for instruction and practice gives a teacher a systematic approach to determining what works best for a particular student. Further, if a student has a disability that presents a challenge to the teacher, consulting the learning chan-

nel matrix will immediately suggest unique opportunities for learning.

Learning channel planning also helps teachers make instructional accommodations for students with specific learning disabilities. In a classroom with typically developing children, teachers commonly use the see/write channel method for assessment (e.g., seeing a single-digit math problem and writing the answer). A teacher would never assess a student with a severe visual impairment in the same manner and might use a feel/say channel (e.g., feeling the problem in Braille and saying the answer orally). This type of accommodation will also benefit children with specific learning disabilities. For instance, the student may perform math facts better in the hear/say channel. So, the hear/say channel provides assessment feedback as valid as the see/write, but does so in the context of integrating a student's special needs.

7. *Making learning more exciting and fun.* Events or stimuli that increase the likelihood of a student engaging in an activity can very "loosely" define motivation (for a more specific and functional definition of motivation, see Michael, 1993). So, activities that motivate the student would include tasks the student can do well. This might also involve novel or different ways in the approach to learning something. Using the learning channel matrix to tap ways a student learns best, as well as providing frequent changes of instruction and practice, will increase the fun in any lesson.

Conclusion

Effective teaching takes a tremendous amount of energy. Not only must teachers perform all the tasks associated with in-class instruction, but they must also think through, revise, and plan instruction outside the classroom. The traditional bell curve, combined with movements such as inclusion, will guarantee that classroom teachers will face students who need additional instruction, requiring more of a teacher's precious time.

Actively incorporating learning channels into a classroom is one way to conserve both short- and long-term personal resources. In the short term, teachers can plan instruction and practice activities so that students receive the maximum benefits from the educational objectives. This translates into long-term benefits by generating less reactive solutions to seemingly intractable learning problems.

Teachers interested in using any of the matrices can make their own by copying the format provided by Haughton (1980). Constructing an original, either on a computer or with a paper and ruler, requires only a grid with the appropriate labels. Additional spaces for information, such as grade level, age, Individualized Education Program objectives, helpful hints, and so on, may also appear on the learning channel matrix.

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