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ABSTRACT

Learning styles are the mental processes and instructional settings a student uses most effectively while learning. Five dimensions of learning style related to cognitive processes are global-analytic, verbal-imaginal, concrete-abstract, trial and error plus feedback versus reflective, and modality (preferred sense for input). In addition, there are learning style dimensions external to the learner, such as cooperative versus competitive instructional setting, group versus individual learning, and variations in physical setting. Cognitive learning styles are usually learned and used unconsciously, and are related to cultural teaching patterns used by parents and elders. Indian students tend to have strengths in the visual modality and toward the global, imaginal, reflective, and concrete ends of learning-style continuums. However, there is considerable diversity among Indian cultures and among individuals in the same culture. Teaching style is best defined as providing a teaching situation that emphasizes a certain learning style. Teachers can incorporate learning styles into their classroom strategies by identifying the learning styles of each of their students, matching teaching style to learning style for difficult tasks, strengthening weaker learning styles through easier tasks and drill, and teaching students learning-style selection strategies. Examples are given. Appendices include identification scales for student learning style and teacher's own teaching style, behavioral indicators of learning styles, and observation techniques. (SV)

ADAPTING TEACHING TO THE LEARNING STYLES OF NATIVE INDIAN STUDENTS

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ADAPTING TEACHING TO THE LEARNING STYLES OF NATIVE INDIAN[1] STUDENTS

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Culture is learned, but how does culture affect the processes by which one learns? This article examines some of the relationships between culture and learning processes for Native Indian students. It is intended to give teachers of Native Indian students a better understanding of the concepts, as well as practical classroom applications.

INTRODUCTION

Susan is a member of the Gitksan Nation in north-central British Columbia. I remember visiting her school and her family when she was about 12. That visit brought to life my growing realization that culture helps determine the learning processes, strategies and styles a student will use.

Join me as I recall my visit.

As I sat in Susan's classroom, the topic was the structure of the Canadian government. After a brief introduction, the teacher carefully explained the parts of the government - MP, House of Commons, Senate, Cabinet. The teacher carefully built up, part-by-part, a description of the Canadian system of government. As she taught, the teacher paused regularly to ask questions, and then helped the students by building on their responses.

But Susan didn't understand! And she had difficulty remembering the details from one day to the next.

That evening I sat with Susan's family at the kitchen table as Grandfather explained the potlatch of Gitksan system of government. As I struggled to understand the complexities, I noticed that he began by describing the potlatch as a whole, by describing its basic principles and overall functions. He wanted to be

1 The term "Native Indian" is used throughout, because it seems to be the term used most frequently by Native Indian people themselves. Two other terms are also used with increasing frequency: "First Nations", especially in educational contexts, and "Aboriginal", especially in legal contexts. Others feel strongly that only the name of the specific culture (e.g. Cree, Nisga'a, Mohawk) is appropriate.

sure that I understood the overall idea before he got down to the details. He did not pause to ask us questions, and we certainly had no intentions of interrupting him with our questions.

And Susan understood! In fact, as we walked to school the next day, she helped me understand better.

Two nights later I sat with the family at a memorial feast for a community member who has just died. I remember hearing a respected Elder talking about Gitksan values and morals. He spoke of very abstract concepts through legends and stories. He distinguished between power as brute force, and power as in finesse, by talking of the killer whale and the eagle. He used images of plants and rocks as living, speaking, reasoning beings to show how all things are independent and worthy of respect.

And Susan understood! Her 18 year old brother also understood but at a different level. Susan's parents understood. So did her grandparents at a level which only the wisdom of age can bring. Even though the elder spoke the same words in the same way to everyone, somehow the imagery allowed each person to understand in his or her own way.

Why did Susan understand the explanation of the Gitksan potlatch, the values and the morals so well? Why did she understand the Canadian system of government so badly?

There are so many factors that could affect Susan's learning. Was it because the potlatch, the values and the morals were much more familiar to her? Very likely. Was it because she had a poor teacher? Probably not, the teacher seemed highly competent. Was it because of language differences? Possibly, but English was the language used throughout, and English is Susan's best language. The English used at home and in the community, however, did differ from "classroom" English. Did Susan feel a little alienated at school? Possibly Susan's teacher and about half of her classmates were not Native Indian but they all lived in the same community.

All these factors could be important but there is one more factor. The <u>way</u> Grandfather and the Elder taught was familiar to Susan. She had already developed the appropriate style of learning styles. The way her teacher taught was not as familiar. Susan had not yet developed the appropriate learning styles.

My visit with Susan illustrates the concept of learning style, the relationship between teaching style and learning style, and ways in which culture can affect a student's learning style.

First let's deal with Susan's learning styles. Susan probably learns best from her Grandfather if she begins by concentrating on the overall idea and deals with details later; she probably learns best from her teacher by learning the details first, then gradually building up to the overall idea. Susan probably learns best from Grandfather and the Elder by listening and reflecting without interrupting; she probably learns best from her teacher by interrupting with questions and by using the teacher's feedback. Susan probably learns best from the Elder by focussing on the images he uses, even though he gets to images through words; she probably learns best from her teacher by focussing on her words, definitions and names.

Second, does this mean that the teacher needs to change her teaching style to reflect Susan's learning style, or is Susan the one who needs to change. The answer is "both". More about that under the Implementation section.

Susan's culture clearly affects her learning styles but there are other factors which affect her learning style even more - such as life experience, influence of mother and other learning experiences. More about that later.

Third, Does this mean there are cultural patterns on which teachers can build, to teach their students more effectively?

The answer seems to be a carefully qualified "Yes". It can be said that culture has a meaningful effect on learning styles. But it cannot be said that there is one specific learning style for all Native Indian students.

And that is the focus of this article - an understanding of ways in which teachers can use learning styles to help Native Indian students.

In the remainder of this article, the notion of learning style is discussed. Steps for classroom use are provided, including a description of two integrated scales for measuring learning styles and teaching styles which I have developed. There is also discussion of ways in which learning styles are learned and the manner in which culture affects this. Then some of the learning style patterns for Native Indian students are described. Finally, some examples and activities that have been used successfully by teachers are presented. Most of the article is based on my professional development workshop, "Adapting Teaching to the Learning Styles of Native Indian Students".

WHAT ARE LEARNING STYLES?

I am sure that you can remember situations in which you explained a difficult concept one way and some of your students grasped it. When you explained another way, other students grasped it. Some students may have grasped the concept best when you used a diagram or image. Others may have grasped it better when you used dictionary-style definitions. Some students developed their reading skills better when you emphasized whole language. Others did better when you emphasized phonics and word attack skills.

All of these examples illustrate what is meant by learning styles.

Learning styles are the mental processes and instructional settings a student uses most effectively while learning.

Mental processes refer to organizing, perceiving, coding, remembering and reasoning. Learning styles may also refer to the **usual**, rather than the **most effective** processes and settings. But it is far more practical in the classroom to focus on the most effective learning styles.

Five dimensions of Learning Styles:

There are five dimensions of learning styles, which I have found in my research, my work with teachers, and from talking with elders, to be the most useful for the classroom. These are as follows:

1. Global ----- Analytic
2. Verbal ----- Imaginal
3. Concrete ----- Abstract
4. TEF ----- Reflective
5. Modality

1. Global ----- Analytic

The first dimension is Global --- Analytic. At the **global** end, the student tends to understand best when the overall concept is presented first, or presented in a meaningful context. The more **analytic** student tends to learn better when learning is presented in small pieces and gradually built up to the whole; context is less important (even confusing).

For example, in learning latitude and longitude, the more global student will learn best when the functions of both longitude and latitude are presented with meaningful examples right at the beginning. An overall chart may be particularly helpful for this student. The more analytic student will learn best if one term is presented first and fully understood, then the second term, then the examples and functions.

> Note: It is important to think of global and analytic processes as being on a spectrum or continuum representing different combinations of global and analytic processing. Some learning style models strictly categorize students into **either** global or analytic, rather than **more** global or **more** analytic. They miss the fact that no learning or thinking process is entirely global or entirely analytic. I prefer to conceptualize students as being at different places on a continuum between exclusively global and exclusively analytic processing.

2. Verbal ----- Imaginal

The second dimension of learning styles is Verbal --- Imaginal. The more **verbal** learner learns better from highly verbal explanations or from dictionary-style definitions, relies more on words and labels uses verbal regulation of behavior more effectively, and codes concepts verbally. The more **imaginal** learner learns better from images, symbols and diagrams. The more imaginal learner remembers better if the coding uses images, and uses images to regulate behaviour.

Imagery may be one of areas in which our western, European culture is lacking. We don't seem to make good use of it except in poetry and advertising. Yet imagery can be very effective in teaching. Almost all of us could improve our teaching techniques in this area.

> Note: Imagery refers to more than visual imagery. The image may be related to any of the senses. For example, learners can process sound images or images involving any of the other senses. One student may have a sound-image of a major chord by remembering the individual notes which

make up that major chord (an analytic image) or another by remembering the sound-image which those sounds make when they occur together (a global image).

Images need not be memories of actual events nor do they need to be accurate. For example, imagine the taste of a mustard and jam sandwich. While it's not likely that you've ever had such abominable combination, I'm sure you can imagine its taste, correctly or incorrectly.

Images need not be concrete. They can be quite abstract. For example, consider your images for the word "love", or "power". These words bring a very complex set of concrete (visual, tactile, aural) and abstract images to mind. The abstract images may be so abstract and complex that they couldn't possibly be communicated. But they exist, and they are very much a part of remembering and learning processes.

3. Concrete ----- Abstract

The third dimension for learning styles is Concrete --- Abstract. This dimension needs little explanation, except to remind the reader that some students do learn better when the concept is presented first in its aostract form (perhaps as a principle or rule). Such students will sometimes even be confused by, or fixate on, the concrete examples which you give.

4. TEF ----- Reflective

The fourth dimension: TEF --- Reflective is still being developed. It comes mainly from my work with Native Indian students and from discussions with the old people as they compare traditional Native ways of learning to contemporary ways. At one end of the continuum is a **Reflective** type of learning in which the learner completely thinks through the new learning before using it. At the other end is what I call "Trial/Error/Feedback" or "**TEF**", in which the learner responds more quickly (Trial), knowing the answer may not be completely correct (Error), expecting to learn from the teacher's Feedback to the response. One learns to ride a bicycle using TEF learning style.

We use both types of learning as part of teaching. For example, we may ask the student to carefully think through a concept before answering (reflective). Or we may use a TEF approach by asking the child to respond (trial), knowing that there will be some errors in the response and that we will give some feedback to help the student refine his or her understanding.

Impulsive responding is not really a part of TEF. Impulsiveness is usually ineffective for learning because it involves trial and error but no feedback. If the TEF approach is to work well, **feedback** which is perceived and understood must be an integral part of the process.

5. Modality

The fifth dimension of learning styles is Modality. This multiple dimension reflects the fact that some students learn more effectively through seeing, others through hearing, others through touching, and so on. For example, a kindergarten student learning the letters of the alphabet may be helped considerably by tracing letters on a piece of sandpaper cut in the shape of the letter (tactile mode).

Another student may find this of little value. One student may find visual input more useful than auditory in learning; another may find the opposite.

Other Learning Styles

The five dimensions of learning styles, just discussed above, all relate to cognitive processes. I am most interested in cognitive processes or cognitive learning styles because in the long run, I think they will be the most helpful to classroom teachers.

However, there is a whole set of useful learning style dimensions which are not cognitive; they are external to the learner. They are listed below along with the cognitive processes.

A. Cognitive Processes

1. Global....Analytic
2. Verbal....Imaginal
3. Concrete....Abstract
4. Trial-Error-Feedback....Reflective
5. Modality (Visual, Aural, Tactile, Smell, Taste)

B. Instructional Setting

1. Cooperative....Competitive
2. Individual....Group
3. Adult....Peer
4. Formal....Informal
5. Type of Humor
6. Warm....Cold Teacher
7. High....Low Demand Climate
8. Active....Receptive

C. Physical Setting

1. Desk Arrangement
2. Temperature
3. Light Level

4. Time of Day

"Best" Learning Style

There is no "best" learning style or learning style profile for all situations. Indeed it is often empowering for a Native Indian student to find that his or her learning styles are as effective as those of the other students, even though they are different. For example, students can learn many concepts equally effectively emphasizing either a global or analytic approach, emphasizing either a verbal or imaginal approach.

Sometimes, however, the specific learning task requires a specific learning style. For example, when a student learns to do long division, that student is required by the nature of the task to use an analytic, sequential approach (even when there is a calculator handy). However, when a student is asked to identify

the theme of a short story, the nature of the task requires a more global approach.

Thus the "best" learning style depends on both the learning style strengths of the learner and the nature of the task.

Teaching Style

Teaching style is best defined as providing a teaching situation in which a particular learning style is emphasized. Think of teaching style as the mirror image, the complement, to learning style.

There is considerable evidence to suggest that our teaching styles are based largely on our learning styles. If I learn best using an analytic, imaginal, concrete approach, then I will be more likely to teach using that approach.

STEPS FOR CLASSROOM USE

I have developed a four-step process for using learning styles in any classroom. The four steps are as follows.

1. IDENTIFY learning styles of individual learners.

It is very important that you as the teacher identify the individual learning styles of each of your students. Don't just categorize their learning styles on the basis of the cultural groups to which they belong.

To help with identification, I've developed an integrated pair of Learning Style and Teaching Style Scales. Copies of the Scales are included in the Appendix.

The first scale, the Learning Style Identification scale, is completed by the teacher after observing and working with the child in the classroom setting for a few weeks. The Scale is based on classroom behaviors which teachers can readily observe. It was developed with input from teachers in many parts of Canada and the U.S.

The second scale is the Teaching Style Identification scale. It is also completed by the teacher and is based on behaviors the teacher may use when teaching difficult concepts or tasks. The behaviors on the Teacher Scale are closely related to the behaviors on the Learning scale. This allows the teacher to compare his or her teaching styles to the learning styles of the student(s).

Another approach to identification is to familiarize yourself with behavioural indicators of the various learning styles (see Appendix). Then watch for the behaviours over about four weeks. Try to stage situations in which they might occur. Set aside about one minute per teaching hour to systematically record learning style strengths and weaknesses. Use "post-it" notes or make it part of your anecdotal record-keeping for report cards. Then summarize your results at the end of four weeks. You will not only have useful information on many of your students; but you will also find you are already making adjustments in your teaching style.

2. MATCH teaching styles to learning styles for difficult learning tasks.

This step seems straightforward but it presents two major problems. The first problem is to develop the variety of teaching styles required to match the learning styles of your students. Good teachers already have a variety of teaching styles, so it is not as great a problem it may seem. In fact, working on your weaker teaching styles is an obvious way to improve your teaching effectiveness.

The second problem is to deal with the multitude of learning style strengths in a classroom, whether it is an all-Indian class, or a mixed class. The general guideline , with a **difficult** learning task, is to teach to the most frequent learning style strengths in your class. The more important the learning task, the greater the variety of learning styles to teach to. When you use a particular teaching style, it is of greatest help to students with the matching learning style. Keep in mind that this particular learning style also can "lay the groundwork" or reinforce for students who do not have the matching learning style strength.

But there is more to effective application than simply matching learning styles and teaching styles. Focus on steps 2 and 3 together.

3. STRENGTHEN weaker learning styles for easier learning tasks and in drill and practice.

Since some tasks require a specific learning style, students must be able to work with a variety of learning styles. A Native Indian student may have to develop greater proficiency in Western European learning styles since that is how the texts and curricula are organized and presented. But don't overdo this. Respect the student's stronger learning styles as much as possible.

Improvement of weaker learning styles can be accomplished through practice-with-success. For example, present easier learning tasks in the weaker style. Use drill and practice which emphasize weaker learning styles, once the concept is learned.

4. Teach learning styles SELECTION STRATEGIES.

In most cases, learning style selection strategies develop unconsciously through emphasis on steps 2 and 3. In fact, for younger students or for students who are having academic difficulty, you will just confuse them if they have to learn selection strategies. Don't use check lists or new terms. Let it happen unconsciously through practice-with-success.

With other students, use "think aloud" or other means of consciously considering selection strategies. Some students are fascinated by the fact that they can learn a concept or mentally organize it in different ways. (But don't bog them down with learning styles jargon. Use their vocabulary.)

HOW ARE LEARNING STYLES LEARNED?

Learned or Innate

I'm often asked if learning styles are learned or innate. The evidence suggests learning styles are primarily learned. Most learning styles are learned as young children from mother, father, grandparents and close family friends with

whom the child interacts regularly. From them the child learns content and skills. But the child also "learns how to learn" (learning styles). The learning styles of caregivers have considerable influence on the child's learning styles. By the time a child gets to school, many of the learning styles have already been laid down.

Can Learning Styles Change?

However, learning styles can change; new learning styles can be learned. In fact this often happens in the first few years of school if the learning styles encouraged by the teacher are different from the learning styles encouraged by the parents. This is frequently the case for Native Indians students.

Learning Styles are Usually Learned and Used Unconsciously

Learning styles are usually learned unconsciously. For example, when my son was 4 he asked me what makes a rainbow. I taught physics at one time, so I began to explain reflection and refraction, light waves and color. Even though I tried to use words that were at his level, he soon gave up. "It's okay, daddy, I understand now". Of course he didn't understand at all and he learned almost nothing about rainbows. However, he had learned **something** unconsciously. He had learned that when there is a very difficult concept to be understood, many words will be used. The seeds were being sown, unconsciously, for a verbal learning style.

CULTURE AND LEARNING STYLES

Introduction

During my visit with Susan, she was learning her culture. And her culture also affected the processes by which she learned. Susan's culture helped determine <u>how</u> she learned.

If learning styles are learned from the people who are important to us and if learning styles are learned from our life experiences, then one can see how culture has an influence on learning styles. Furthermore, one can also understand that culture is only one of a number of factors in determining learning style.

If a Native Indians child comes from a culture in which children learn mainly by listening and not interrupting, that child will be likely develop a more reflective learning style. If a child comes from a culture which encourages interruption, question, trial, error and feedback (as in Western, middle-class cultures), then the child will be more likely to develop a TEF learning style. If a Native Indian child comes from a background in which learning is demonstrated or in which symbols and images are used regularly, then the child is more likely to develop a more imaginal learning style. If a child comes from a culture in which the spoken or written word is used a great deal in learning (as in Western, middle-class cultures; many urban cultures), that child will be more likely to develop a more verbal learning style.

Of course, the way in which the parent or teacher teaches is not determined solely by cultural background - there are significant individual differences. As a result there are significant individual differences in children's learning styles. Indeed, there is considerable overlap in learning styles of students

from various cultures. The greater the overlap in lifestyles and contact between two cultures, the greater the similarity in learning style patterns. It is extremely important to remember that there is no such thing as the Native Indian learning style, or the Punjabi learning style, or the white learning style, or the Chinese learning style. There are some patterns which are more likely to emerge but there will be very significant diversity among individuals from each culture.

Cultural Patterns

Having said all this, here are some of the patterns which are a little more likely to emerge for students from Native Indian cultures. These are based on my research, teaching, teacher observations and discussions with parents.

Native Indian students are more likely to have strengths towards the global, imaginal, reflective and concrete ends of the dimensions discussed above. For younger children, touch will probably be more important than for many other children. Visual processing more likely will be stronger than auditory. The more traditional the community, the more likely the child will show this profile. Even after many generations of contact, some of these learning style strengths may still be observable.

There are differences in these patterns among different Native Indian cultures. For example, in one study the students from one Native Indian nation were much better in global processing. In the other nation they were much better in analytic processing. Western, middle-class, anglophone children (the children on which our school system is based) seem more likely to have learning style strengths towards the analytic, verbal, abstract, TEF and auditory ends of the learning style dimensions.

This is very different from the pattern for Native Indian children. A teacher may use examples and ideas that are appropriate to the culture and lifestyle of the Native students in a class. But that may not be enough if the teaching styles are unfamiliar to the Native students, or fail to reflect their stronger learning style.

a. Global --- Analytic

Native Indian students are more likely to have a greater strength with a global learning style than an analytic.

Of course this doesn't mean every Native Indian student will have this relative strength. Rather, in a group of 30 Native Indian students there will usually be more students with a strength towards the global end than in a group of 30 white, middle-class students. Individual differences can make the patterns very complex.

This trend is more likely with students from traditional and more isolated families and communities.

It is clear that the teacher must check out the individual learning styles in the class. Assumptions about an individual's learning style must never be made solely on the basis of cultural grouping.

I have talked with elders, parents and teachers about the frequency of this

global strength. This strength seems to come from traditional teaching styles, as shown by the way Susan's Grandfather explained the potlatch, at the beginning of this article.

One of the Elders explained it this way (I have paraphrased). "Our way of life and our values are based on looking at the world as a whole. All the parts are related. They depend on each other. So when we teach a child we begin with the whole. We want the child to learn the overall idea or skill first. We want the child to learn how this idea fits in with other ideas. The details are important but they can wait until later." As we talked it became clear to me that the use, the functions, the applications of this idea or skill must also be understood before the details.

b. Verbal --- Imaginal

The use of imagery as a way of communicating complex or abstract concepts has always been used as an important part of learning in most Native Indian cultures. Legend systems and stories are excellent examples of such usage. The Elder, at the memorial feast that Susan's family attended, demonstrated this idea when he spoke of the power of the killer whale and the eagle.

This approach to communication seems to be behind the result that Native Indian students are more likely to have a greater strength with an imaginal than with a verbal learning style. It is likely that language differences (e.g., being taught in a second language, community English differing from classroom English) also contribute to this finding.

For teachers, this mean more frequent and effective use of imagery. If there is one way we can improve our use of teaching styles for Native Indian students, it is probably through better use of imagery.

c. Concrete --- Abstract

Native Indian students, in the school setting, are more likely to have greater strength with a concrete learning style. Teacher and parent observations as well as my own research confirm this consistently.

The source of this learning style is less clear. It does not seem to come from traditional Native Indian teaching styles, to any great extent. The legends clearly show the depth of abstractness in traditional teaching.

I can only surmize that the consistently concrete learning styles are a reflection of irrelevance of what we teach and how we teach. In classroom after classroom I see curricula, teaching methods and explanations that are not relevant to the life experiences of the students. This is a problem in any non-urban or cultural minority classroom, but it is a particularly serious problem in Native Indian classrooms. The less relevant the instruction, the more concrete it must be.

d. TEF --- Reflective

Native Indian students seem more likely to have a strength towards a reflective learning style. This certainly fits with traditional teaching styles, as demonstrated by both Grandfather and the Elder.

To understand the impact of culture on this learning style for Native Indians, we must also look at other factors.

Self confidence, in school, is so low for too many Native Indian students. Low self confidence is caused by many factors, but the result is that many of the students will not answer at all until they are absolutely sure the response is correct (and even then, there may be hesitation). This is certainly a reflective learning style but it may not be very effective for the student.

When low self-confidence is coupled with seriously low achievement, a student will often just give up trying. It is low self-confidence in the extreme. The student just guesses the answer, sometimes impulsively with no reflection at all. This impulsive, guessing response is not TEF, even though it may appear to be at first, because feedback and learning are not part of it. "Why try to learn from the teacher's feedback, when I can't learn anyway?"

In both situations, unnecessary reflection or impulsive guessing, the student needs carefully structured practice-with-success. The practice needs to be done where the risk of embarrassment from failure is very low (e.g., working one-on-one with a Native Indian paraprofessional). Feedback on success should be given as immediately as possible.

e. Modality

The visual mode is the strongest mode for a large proportion of Native Indian students.

The source of this strength may be a reflection of the traditional lifestyles of Native Indian cultures. A strong visual sense is very important to the survival of a society that lives on the land, hunting and gathering. Even though many Native Indian people no longer live on the land, the importance of the visual sense may continue to be an important part of teaching styles and, thus, learning styles.

My greatest concern with respect to this learning style strength is that it has become a stereotype. Too often it is assumed that since a student is Native Indian, he or she must have a strength in visual learning. "All Indians are wonderful artists" its extreme form.

Some of my work suggests that the sense of touch may be a stronger learning style for many pre-school and primary Native Indian students than for non Indian students of the same age. For both groups, touch comes third as a learning modality after visual and aural (hearing) modality. But often it is a "close third" for Native Indian students, and a "distant third" for white, middle class students.

f. Other Learning Style Patterns

Many Native students seem to stand out in three other areas related to learning styles: Repetitive drill; cooperative learning and class discussion.

Teachers often report that many of their students seem to prefer repetitive drills and exercises, as a style of learning. I am still following this up. But in most cases the students are not learning - it is more likely that they are using this as an activity which involves no risk of being wrong. Repetitive drill looks like the

students are working and learning. And it is "safe" for a low self-confidence, low self-esteem student. Most of these students need to be carefully weaned to less repetitive, but more meaningful, activity. This is certainly a situation for increasing practice-with-success in small increments.

Cooperative learning seems to be ready-made for Native Indian students since cooperation is so compatible with traditional practises and lifestyles. But many teachers have had difficulty using this approach in practice. The explanation may be that, in the school setting, students are used to teacher as a knowledge source. Cooperative learning requires a different set of learning styles which they haven't yet developed (or in which they lack confidence). The students need "to learn how to learn" from the cooperative setting.

Many Native Indian students are used to finding the one correct answer to questions. As a result they have difficultly in discussions in which they offer an opinion or express a point of view. Language development is greatly enhanced by open discussion. So it is important, again, to help the students "learn how to learn" using discussion - that is, to develop a discussion-oriented learning style.

CLASSROOM EXAMPLES

The following examples were developed with teachers who used them in their classrooms. Note that the examples are related to learning styles more than to cultures.

1. **Global** (More likely a strength for Native Indian students).

a) Many students with a global strength do well at filling in missing pieces in an overall structure. They also learn vocabulary better in a meaningful context. Use a cloze procedure (filling in missing words) with a story to develop vocabulary. Select a story or section from a text, delete the words you want learned. Also delete a few words that the student already knows (to ensure some success).

b) To develop word attack skills that involve looking at individual letters (global students tend to be weaker in this), use exercises in which letters are deleted from words and need to be filled in by the student, e.g.: goal, _oal, g_al, go_l, goa_; toad, _oad, toa_, t_ad.

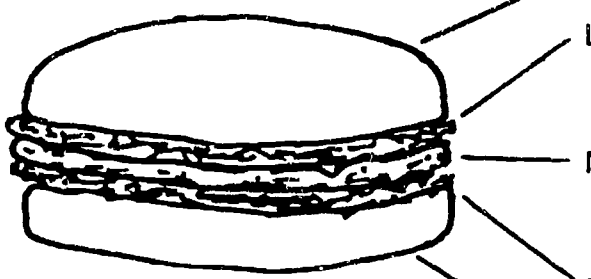
c) For the more global learners, spend twice as long on the introduction and overview to a topic. Present applications of the concept or skill. Have students come up with applications and uses. All this comes before they understand the details of the concept or task.

2. **Analytic** (Less likely a strength for Native Indian students).

a) Use a phonetic approach more often in language arts. Despite its successes, whole language is not <u>always</u> the best approach for every student at all ages.

3. **Imaginal** (More likely a strength for Native Indian students.)

a) The "hamburger" model for paragraph writing.



b) When teaching place value, use different colours for units, tens, hundreds, thousands, etc. This is much easier now that colour printers are more available for computers. This also uses images that are more concrete than abstract.

c) When going from concrete to abstract, use an image to help make the transition, e.g., for grouping in multiplication, after the student is used to grouping coloured blocks, have the student practice grouping them mentally (image), before actually removing them.

d) Letters and sounds - see Charlie Brown's Alphabet, a computer game (dynamic visual and auditory images).

e) Use imaginal regulation of behaviour to learn and remember math computation skills, social skills and psychomotor learning; e.g., have the student visualize himself or herself taking three deep breaths then doing it, for anger control; make a mental picture of complete-but-simple long division question as a way of remembering the steps; remember the "feel" of weight on the downhill ski to avoid "head plants" on the ski hill.

4. **Verbal** (Less likely a strength).

a) Use letters, acronyms and labels to help students remember information e.g., ROYGBIV (order of colour in rainbow), "Mary Very Easily Makes Jam Sandwiches Under No Pressure" (order of planets in our solar system).

b) Use verbal regulation of behavior to learn and remember math computation processes, social skills and psychomotor learning; e.g., Memorize "Three deep breaths and cool it" for anger control; "Estimate-Multiple-Subtract-Bring Down" for long division; "Weight on downhill ski" to avoid "head plants" on the ski hill.

5. Concrete-Abstract

a) When using concrete manipulatives, pay careful attention to those students who cannot abstract the concept or generalize it to other examples. Do these students also have difficulty with "learning by discovery"? Some of these students may be better off if they learn the concept in its abstract but simple form **before** they apply it to concrete examples.

6. Composite examples

a. Use an inflated balloon to teach interrelationships between pressure, volume and temperature using Imagery (concrete and abstract, visual and auditory), Global thinking, TEF and/or Reflective using a balloon. Students imagine they cover themselves with padding and are sucked into (sound effects are great here) the balloon using my "Magic De-magnification Machine". Then they imagine what happens as they bounce off each other inside the balloon just as gas molecules do. They also imagine the effects of heat, cold, change in balloon size and changes in the number of the students (gas molecules) in the balloon. This is great fun, especially when you pop the balloon at the end. (The script is available on request.)

b. Silly story; best used with groups of four (e.g. Sue, Sam, Albert and Dennis). Complete the following story:

_____ Sue _____ _____ to _____ Sam. But _____
(Adjective) (Verb) (Adverb) (Adjective) (Adjective)

Dennis _____ _____ to Albert. So the _____ four students
(Verb) (Adverb) (Adjective)

decided to _____ _____ to _____.
(Verb) (Adverb) (Noun)

The students will likely do this analytically and verbally if they are given no further instructions. So have them first come up with the overall idea of their story (Global) and illustrate it (Imaginal-Dynamic) before filling in the words.

Watch to see which students are stronger with the global and/or imaginal components and which are stronger with verbal, analytic. This is useful for identification. But remember, you are interested in the relative strengths **within** each student, not comparisons **between** students.

SUMMARY

Learning styles can significantly help the teacher of Native Indian students. There are learning style patterns which are more likely to emerge. However, individual differences within cultures necessitate caution - don't assume that the pattern applies to every member of that group.

Wherever possible, identify the learning style strengths of individuals. Identify your teaching style and your students' learning styles (use the Teaching

Style Identification and Learning Style Identification scales). Teach to the learning style strengths of your students when dealing with difficult learning tasks. Strengthen weaker learning styles whenever possible. Watch for patterns among the students in your classroom, never ignoring individual differences.

Cognitive Processes

1. Global....Analytic
2. Verbal....Imaginal
3. Concrete....Abstract
4. Trial-Error-Feedback....Reflective
5. Modality (Visual, Aural, Tactile, Smell, Taste)

Steps for Classroom Use

1. IDENTIFY learning styles of individual learners.

2. MATCH teaching styles to learning styles for difficult learning tasks.

3. STRENGTHEN weaker learning styles for easier learning tasks and in drill and practice.

4. Teach learning styles SELECTION STRATEGIES.

APPENDIX

LEARNING STYLE IDENTIFICATION SCALE

Arthur J. More
University of British Columbia

This scale determines the stronger and weaker learning styles and learning strategies of a student. As you complete the scale, think of the student learning difficult concepts and skills. Think of the student learning in a variety of situations.

Student Name _____

When this student is learning a difficult concept , skill or task, he or she:

	almost always	usually	some times	seldom	almost never
1. learns best if the teacher does a good overview before working on the details.					
2. is only confused by examples of how to use the concept.					
3. finds out as much detail as possible before completing the task.					
4. attempts the task, expecting to learn from feedback about how (s)he did.					
5. does better when going from "examples" to "rules", than from "rules to examples".					
6. understands better when abstract concepts or principles are given.					
7. does better when pictures, diagrams or charts are used.					
8. does better when "hands on" activities are used.					
9. answers impulsively, but makes use of information on the correctness of his or her answer.					
10. does better if the concept or task is understood before dealing with specific concrete examples.					
11. does better by using mental images to help understanding.					
12. understands better by developing his or her own written explanation.					
13. does not need many examples to understand the concept or task, in fact the examples may even confuse.					

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	almost always	usually	some times	seldom	almost never
14. needs many examples to understand the concept.					
15. uses "wordy" explanations.					
16. learns much more effectively when the correctness or incorrectness of answers are explained.					
17. finds that names or labels for concepts are helpful for understanding and remembering.					
18. in reading, does better when phonics and specific word attack skills are used.					
19. does better when (s)he can draw pictures or diagrams to aid in understanding.					
20. in reading, does much better with "whole language" approaches than other approaches.					
21. finds "dictionary-style" definitions very helpful (provided the definitions are at the appropriate level).					
22. takes some time to think about answers before responding.					
23. does better when the concept is presented using concrete examples.					
24. does better when symbols or diagrams, rather than actual pictures, are used.					
25. does better when the teacher uses metaphors and similes (e.g. it is like ....).					
26. does better on learning relationships between concepts.					
27. does better when the task is broken down and the parts are learned in sequence.					
28. puts up his or her hand right away, even when unsure of the answer.					
29. reflects on each question to make sure of the answers.					
30. prefers to think it through and try to understand, rather than depend on teacher for correction.					
31. begins by breaking the task into smaller parts.					
32. does better if the concept is presented in a meaningful context.					

Scoring instructions on following page

LEARNING STYLE IDENTIFICATION SCALE

DIRECTIONS FOR SCORING

1. Go back to the questions. Score each response as follows:
   "almost always" = 5 "seldom" = 2
   "usually" = 4 "almost never" = 1
   "sometimes" = 3

2. Write the score for question 1 in the blank space for item 1 below. Do the same for question 2, and so on through the remaining questions.

3. Calculate the Total Global score by adding the Global scores. Write this score in the space provided. Calculate the remaining scores in the same manner.

4. Compare the Global and Analytic scores. A difference of more than 2 is meaningful. Similarly compare the Verbal and Imaginal scores, Concrete and Abstract scores, T/E/F and Reflective scores.

5. What are the stronger and weaker learning styles of this student? How do they compare with other students' learning style profiles? Are there relative strengths and weaknesses that will help you work more effectively with this student?

SCORING FORM

Style	Item	Score	Total	Style	Item	Score	Total
GLOBAL	1	_____		ANALYTIC	2	_____	
	20	_____			18	_____	
	26	_____			27	_____	
	32	_____	Total _____		31	_____	Total _____
VERBAL	12	_____		IMAGINAL	7	_____	
	15	_____			11	_____	
	17	_____			19	_____	
	21	_____	Total _____		25	_____	Total _____
CONCRETE	5	_____		ABSTRACT	6	_____	
	8	_____			10	_____	
	14	_____			13	_____	
	23	_____	Total _____		24	_____	Total _____
TRIAL/ ERROR/ FEEDBACK	4	_____		REFLECTIVE	3	_____	
	9	_____			22	_____	
	16	_____			29	_____	
	28	_____	Total _____		30	_____	Total _____

TEACHING STYLE IDENTIFICATION SCALE

Arthur J. More
University of British Columbia

This scale determines the teaching styles and strategies which you use. As you complete the scale, think of the ways you teach difficult concepts and skills. Think of the ways you teach over a variety of subjects, in a variety of situations.

NAME OF TEACHER _____

When I am teaching a difficult concept, skill or task, I:

	almost always	usually	some times	seldom	almost never
1. begin with a good overview before working on the details.					
2. avoid confusing the students with examples of how to use the concept or skill.					
3. ask students to think carefully about their answers before replying to questions in class.					
4. encourage students to try the task, and learn from their errors and feedback.					
5. give the "examples" first and then follow with the "rules".					
6. give first priority to understanding the abstract part of the learning task.					
7. use pictures, diagrams or charts.					
8. use more "hands on" activities.					
9. encourage students to make quick responses and then learn from information on the correctness of their answers.					
10. ensure that the concept is understood before dealing with specific concrete examples.					
11. encourage the students to use mental images to help them to understand better.					
12. have the students develop their own written explanations to help them understand better.					
13. give the "rules" first and then follow with the "examples".					

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	almost always	usually	some times	seldom	almost never
14. avoid the abstract, or leave it until the end.					
15. use lengthier or "wordy" explanations.					
16. emphasize explanation of the correctness or incorrectness of student answers.					
17. use names or labels for concepts to help the students to understand and remember.					
18. rely, in reading, on phonics and specific word attack skills.					
19. have the students draw pictures to aid in understanding.					
20. in reading, rely more on "whole language" approaches.					
21. find "dictionary-style" definitions are very helpful (provided definitions are at an appropriate level).					
22. encourage the students to take some time to think about answers before responding.					
23. emphasize my use of concrete examples.					
24. use symbols, rather than photographs or actual pictures.					
25. use metaphors and similes (e.g. it is like....).					
26. emphasize learning relationships between concepts.					
27. pay special attention to breaking down the task and presenting the parts in sequence.					
28. ask the student who puts up his or her hand first, even when (s)he seems unsure of the answer.					
29. encourage the students to reflect on each question before answering.					
30. encourage the students to think through and try to understand the concept rather than depend on me to correct them.					
31. begin by breaking the task into smaller parts.					
32. make sure I present the concept in a meaningful context.					

Scoring instructions on next page

TEACHING STYLE IDENTIFICATION SCALE

DIRECTIONS FOR SCORING

1. Go back to the questions. Score each response as follows:
   "almost always" = 5 "seldom" = 2
   "usually" = 4 "almost never" = 1
   "sometimes" = 3

2. Write the score for question 1 in the blank space for item 1 below. Do the same for question 2, and so on through the remaining questions.

3. Calculate your Total Global score by adding the Global scores. Write this score in the space provided. Calculate your remaining scores in the same manner.

4. Compare your Global and Analytic scores. A difference of more than 2 is meaningful. Similarly compare your Verbal and Imaginal scores, Concrete and Abstract scores, T/E/F and Reflective scores.

5. You may also compare all eight scores to determine the teaching styles which you use most frequently , and least frequently.

6. Is your Teaching Style profile appropriate to your students? Is it appropriate to your own personality? Compare your profile with colleagues. Discuss the differences. How can this help you improve your teaching?

SCORING FORM

Style	Item	Score	Total	Style	Item	Score	Total
GLOBAL	1	_____		ANALYTIC	2	_____	
	20	_____			18	_____	
	26	_____			27	_____	
	32	_____	Total _____		31	_____	Total _____
VERBAL	12	_____		IMAGINAL	7	_____	
	15	_____			11	_____	
	17	_____			19	_____	
	21	_____	Total _____		25	_____	Total _____
CONCRETE	5	_____		ABSTRACT	6	_____	
	8	_____			10	_____	
	14	_____			13	_____	
	23	_____	Total _____		24	_____	Total _____
TRIAL/ ERROR/ FEEDBACK	4	_____		REFLECTIVE	3	_____	
	9	_____			22	_____	
	16	_____			29	_____	
	28	_____	Total _____		30	_____	Total _____

BEHAVIOURAL INDICATORS OF LEARNING STYLES

1a. **Global**: Tends to understand best when overall concept is presented first; Learns best when the overview or introduction is emphasized; Needs to learn in a meaningful context; Is more able to fill in missing words, parts of a story or explanation; Reading improves more from whole language, language experience, or sight words; Sees relationships easily; Functions are important to understanding.

b. **Analytic** (sequential): Tends to learn better when learning task is presented in small parts and gradually built up to the whole; Learns best when information must be presented in careful sequence; Context is less important; Reading improves more from a phonics approach.

2a. **Verbal**: Learns best from dictionary style definitions; Seldom explains using similes or metaphors; Learns labels easily; Remembers concepts better when labels are used; Uses verbal regulation of behavior more effectively; Codes information verbally rather than imaginally.

b. **Imaginal**: Learns best from images (concrete or abstract), symbols, or diagrams; Often explains difficult concepts using images or similes; Remembers better when an image, simile, or metaphor are used; Good at making up his/her own images but may have difficulty verbalizing them; Uses imaginal regulation of behavior; Codes information using imagery.

3a. **Concrete**: Learns best if examples are presented first, followed by concept or principle; Learns best with support from materials that can be seen touched or heard; Photographs rather than drawing are more helpful; "Hands on approach" is more effective; Needs more examples; May have difficulty separating the concept from the example; Concrete examples are better than abstract examples.

b. **Abstract**: Learns best if concept or principle is presented first, then examples; Picks up abstract concepts as readily as concrete concepts; Needs fewer examples (remember also that familiarity with, or relevance of, the concept will decrease the need for concrete examples); May even be confused by example.

4a. **Trial-Error-Feedback (TEF)**: Prefers to respond quickly (knowing the answer may not be completely correct), expecting to learn from (teacher's) feedback to the response; Responds more impulsively but relies on feedback; Responds quickly but makes more errors; Usually gives the first answer that comes to mind without thinking it through completely (More confident students tend to use this more frequently).

b. **Reflective** (Watch-then-do, Think-then-do, Listen-then-do): Learns better from thinking through (reflecting on) the answer very carefully and completely, than from trail-error-feedback; Takes time to respond; Thinks the answer through first; Has fewer errors because it is thought through or watched carefully; Depends less on external feedback; Often appears to be day dreaming but is actually reflecting.

5. Hearing, Seeing, Touching, Other: Other may include taste, smell, spatial/perceptual.

Summary of Systemic Observation Technique

This is a summary only. It is intended to be used as part of a professional developmental workshop on learning styles.

1. Commit Behavioural Indicators to memory; Ensure you understand them; List additional behaviors appropriate to your own students and courses.

2. Watch for these Behaviors among selected students; Plan questions, explanations, and assignments along the lines of these processes so you can observe students using them; Use "think aloud" technique to bring them out.

3. Take up to two minutes of each teaching hour to quickly record any observations on strengths and weaknesses and of frequencies in these behaviours. **Don't** spend more than two minutes per teaching hour, or you won't have time to keep this up. "Post it" notes are convenient here.

4. Continue taking these observations **consistently and objectively** for three weeks. Compile your results. This will take about three hours. The results will be a very useful accurate indication of learning styles of your students. (The notes you make are also very helpful for anecdotal reporting.)