Developments in Business Simulation & Experiential Learning, Volume 27, 2000

HOW WE LEARN AND WHY WE DON'T: THE COGNITIVE PROFILE MODEL A WORKSHOP IN TEACHING TO REACH YOUR STUDENTS

Lois Breur Krause, Clemson University, Clemson, SC

INTRODUCTION

Research at Clemson University has established the validity of the Cognitive Profile Model for individual differences in learning. Students who take the inventory and use the recommended study techniques show a statistically significant improvement in grades. Application of the model to teaching strategies is a natural following. The author has used teaching strategies based on the Cognitive Profile Model for many years with success, and regularly shares the model and teaching strategies in workshops for faculty at colleges and high schools.

The Cognitive Profile Model

The Cognitive Profile Model is based on Jungian type theory (Jung, C. G., 1990) as is the Myers-Briggs Type Index (Myers & McCaulley, 1958) with which most readers may be familiar, but with certain important differences. The Cognitive Profile Model uses only two of Jung's bipolar descriptors, the Sensor-iNtuitive, and the Thinker-Feeler. These two bipolars are represented by the x (the Thinker-Feeler) and y (the Sensor-iNtuitive) axes on a grid. The quadrants are then labeled by the bipolar they lie between, and are therefore described as Sensor Thinker (ST), Sensor Feeler (SF), iNtuitive Thinker (NT), and iNtuitive Feeler (NF). (NB: The N is capitalized in iNtuitive rather than the I to avoid confusion in symbolic representation with Jung's Introvert.) The student responds to an inventory of 60 pairs of words, scoring one word in each pair by personal preference. The summary result of the scoring is plotted on a grid as one point in each of the four quadrants. The points are joined by lines, and the resulting quadrilateral is the student's cognitive profile. The evaluation of the graphic is then visual. The student sees a dominant quadrant, as the quadrant in which he has the most area. The inventory only takes fifteen to twenty minutes to complete, is self scoring, and gives immediate feedback.

An important difference in this model from others is that the profile emphasizes that the student has some area/preference/ability in each type of functioning, and can enhance those abilities by learning skills in those areas. It specifically avoids pigeonholing the student into one type, to the exclusion of others. The model does not attempt to determine or describe ability, but only preferences for types of action and interaction with people, things and ideas.

Sensory Learners

The sensor thinker (ST) is closest to Dunn and Dunn's analytical learner, working in an organized fashion, methodically and stepwise. The ST student learns best alone, by repetitious drill and practice, and has a profound need for timely feedback. Answers are either right or wrong, and the ST student may be easily frustrated by discovery learning where there is no clearly defined path to the correct result. ST's memorize well, and do best in recall tests. The ST student is advised to study alone, in a well lit structured area, desk and chair, with no distractions, and to do repeated example problems and exercises. Complex concepts should be broken into steps or small pieces, and each piece mastered before going on to the next. Large quantities of information may be tabulated on flash cards, and some stepwise progression devised to facilitate learning. The ST is the classic student for which American schools have been structured for most of this century, and the population from which Dunn (Dunn, 1994, and

Spring, 1994) emphasizes most of our teachers have come, perhaps because they enjoyed success in school under the structure imposed.

The sensor feeler (SF) is also a concrete learner, and is the student for whom cooperative learning is made to order. SF learners must process information orally, and learn best if they can relate personally to the content. When attempting to process complex content, the SF must talk it through, studying most productively with another learner. The SF should break large tasks into several small steps, and find a means of relating to the content. This student may create a story line or example problem using friends' and family members' names or use personification.

Both SF's and ST's need to learn sequentially, building from the known to the unknown with manipulatives where possible. Constructivist theories (Aldridge, 1992) hold well for both ST's and SF's, in that the learning is built stepwise from basics to concept, and that the students build their own learning based on personal experience.

Intuitive Learner

The intuitive thinker (NT) is characterized by logical thinking, perception of patterns and a strong need to understand, needs to process new material alone before discussion, and must see the overall picture prior to processing details to enhance understanding. When beginning new material, the NT should first read the summary to get the overall picture. Once the global concept is grasped, the pieces fit in naturally. The NT must look for patterns in the information in order to facilitate recall, using mnemonics and other memory devises. Since NT's generally do not memorize well or easily, they must understand the concepts in order to figure out what they will not otherwise recall. The NT is perhaps ideally suited for a career in research sciences, but often does not find academic success early due to natural dislike of repetition and memorization.

The intuitive feeler (NF) is the creative learner. Characteristically lacking aptitude for both logic and memorization (unless also strong in NT or ST quadrants), most at home in the abstract, the NF represents the greatest risk for non-completion of the educational process. The NF learns best through metaphor, building new learning on a structure of comparison with some other known concept, no matter how far afield. NF's usually work well in cooperative groups, and should study with other classmates whenever possible. The NF student should look for another situation in which the same "rules" apply, as those that apply to the concept being studied. "How is an internal combustion engine like a rock band?" has meaning for the NF, who will see connections between the various energy sources and sounds in the two contexts, and thereby enhance understanding of internal combustion engines. NF dominant students may also be advised to consider their strongest sub-dominant quadrant in determining appropriate study techniques.

Teaching Strategies

Every classroom or group of learners may be considered to have some learners with dominance in each of the four quadrants. It is only reasonable then to use teaching strategies that meet the needs of all four types of learners. Although we emphasize that every learner has some area in each quadrant, and that each of us needs to develop skills in our weaker quadrants, when the material is difficult it is advantageous to use our strongest quadrant for most effective learning. Teachers repeat everything at least four times anyway, so using four different types of explanations or exercises is not unreasonable.

American schools were designed for ST learners, and indeed, ST learners tend to believe that everyone learns best the way they do. For ST learners, we use linear organization, stepwise processes, and repetitive exercises. We begin

with the details and build to the concepts for these 'part to whole' learners.

SF learners are also part to whole learners, but SF's are the kids who always got into trouble for talking in class. For SF learners we need to personify the material, make it personally relevant to the student, and use cooperative exercises. They need to talk things through to build their own understanding of the material, and cooperative exercises and problem solving works most effectively. SF's also benefit from repetitive exercises, stepwise processes and breaking complex tasks into workable pieces.

NT dominant students are 'whole to part' learners. They need an introductory statement or introduction that describes the overall concept at the beginning of class. Given this introduction they will then be able to recognize a pattern in the details as presented, and will be able to construct a framework for themselves to organize the material. NT learners are abstract thinkers. They are likely to think mostly in pictures rather than words, and readily construct 3 or 4 (the fourth dimension being time) dimensional mental images of concepts. They have an overwhelming need to understand why a process functions as it does, and once they understand a process, they can readily apply it to new situations and problem types.

The NF learner is abstract and 'whole to part' as is the NT, but this is the creative student. The NF uses metaphors to construct understanding of new material, and thinks in pictures as does the NT student. The creative NF learner is often seen as daydreaming, when in reality may be constructing links between previously understood concepts and the new content.

Workshop

The workshop will provide information and practice as time permits on teaching strategies that meet the needs of all students, based on classifications as identified by the Cognitive Profile Model.

Copies of the author's book "How We Learn and Why We Don't: Student Survival Guide" may be purchased through Thompson Learning ISBN 0324-011970, and may be adopted as a regular textbook for a course. It includes the inventory and study techniques discussed here and others.

REFERENCES

Aldridge, B.G. (1992) Project on scope, sequence, and coordination: a new synthesis for improving science education. *Scope, sequence, and coordination of secondary school science, vol. 2. Relevant research* Washington, DC: National Science Teachers Association

Dunn, R. Teacher inservice training at Pickens County School District, 10/21/94

Hanson, J.R., (1991) Square pegs: Learning styles of at-risk students. *Music Educators' Journal* 78,3 (Nov.)

Jung, C.G. (1990). *Psychological Types.* ninth printing, revision by Hull, R.F.C. of the translation by Baynes, H.G. Princeton: Princeton

Krause, L.B. (1996). *An Investigation of Learning Styles In General Chemistry in Students.* Doctoral Dissertation, Clemson University.

Krause, L.B. *How We Learn and Why We Don't.* Author's web site located and maintained at http://home.earthlink.net/~breurkrause

Myers, I. & McCaulley, M. (1958). *Manual: A guide to the development and use of the Myers-Briggs type indicator.* Palo Alto, CA: Consulting Psychologists press

Smedley, L.C. (1987) Chemists as learners. *Journal of Chemical Education.* 64 American Chemical Society

Spring, J. (1994) *The American School, 1642-1993,* third ed. McGraw-Hill: New York