A Study in Learning Styles of Construction Management Students

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Abstract

Students take in and process information in different ways. College faculty members 'teaching methods are not all the same. However, rarely there are any efforts by faculty members to harmonize their teaching styles with their students' learning styles. When there is a major mismatch between the learning styles of majority students and teaching styles of the instructors both get frustrated. Although it is not possible for the instructors to match individual learning styles of every student in the class, as long as there is a balance in teaching method in relation to the teaching styles of the majority of the students overall effectiveness of the teaching in the class will rise. It is theorized that the students in different discipline may have different types of learning styles. A simple study was conducted at Farmingdale State College for construction management students to estimate the learning styles as a group. The paper will outline the study and discuss the results of the study. A conclusion and recommendation follows.

Introduction

How people learn fascinated Psychologists and Behavior Scientists for centuries. There are many theories that have been developed, some of them will be discussed in brief later in the paper. But the paper will focus on the students' behavior rather than psychological theory. In a paper written in 1950, the noted Psychologist B.F. Skinner[1] provoked considerable and continuing controversy when he provided a generally negative answer to his question, "Are theories of learning necessary?" He took the position that psychology was not ready for hypothetico-deductive theories. He expressed the opinion that psychology needed more facts in order to develop postulates and general theory which would subsequently be supported empirically. He objected to interpretations which make extensive reference to presumed physiological correlates or to internal mental events, or which make extensive use of constructs to represent behavior. In contrast, he recommended that psychologists would be better advised to focus on collecting more empirical data concerning behavior and at least temporarily to constrain their drawing of inferences beyond the data collected. The issues of individual differences in learning ability and in learning styles were the focus of a group researchers throughout the twenty century. Their primary substantive concern has been individual differences, which usually refers to both the ability and habitual behavior or customary ways of acting, usually referred to as personality characteristics. Their preferred and sometimes exclusive research methods are the correlational methods. Closely aligned with this group is the developmental psychology tradition which has been particularly concerned with the way that individuals differ at various ages and stages of development , their preferred method of research most frequently has been that of naturalistic observation or some other form

of observation in a more controlled or contrived situation. There is some suggestion that the behavioristic or neobehavioristic theories may provide some interesting facets of integration in new theories along with the information-processing conception which has become more and more popular in recent years. On the other hand, we could define instructional theory as an integrated set of principles which prescribe guidelines for arranging conditions to achieve educational objectives. It is assumed that these principles will be applicable to educational situations in which a teacher is present as well as to the various contemporary educational methods implemented primarily through the design of educational materials. It is also assumed that instructional theories in general must be neutral with regard to selecting educational objectives, although it is expected that some instructional theories may be especially oriented toward certain objectives. Psychologists would conduct basic research and accumulate a fund of knowledge about human learning. Perhaps educators would take this fund of knowledge and apply it in developing their educational programs. But a host of additional problems develop when there is not one psychology, but several. When there is not one theory of learning but many, particularly when the many have somewhat contradictory implications for educational practice. With the emergence of several schools and resulting competition among them, spokesmen seemed to lose their reservations about the tentative nature of their practical suggestions. More and more recommendations were made as scientific facts rather than as tentative descriptions for the real world outside laboratory. Although there is an expectation among psychologists and educators that it should be possible to derive quite explicit prescriptions for educational practice from the comprehensive learning theories. If an educator is going to select a learning theory, it would seem reasonable to expect that he/she would pick the theory which provides the most complete and valid description of learning as it occurs in the classroom.

Objectives

The objectives of this paper is to review a number of learning theories and learning styles related to construction management students and report a study conducted at Farmingdale State College to find learning styles for construction management students.

Learning Theories

At the risk of oversimplification, one can divide learning theories into two major categories – namely, stimulus response or conditioning theories, and cognitive theories. Of course, it is important to recognize that these are quite gross categories in that at times there have been greater differences within these two general groups than there have been greater differences within these two general groups than there have been between some pairs of theories across these two groups. Nonetheless, it would be useful for our purposes here to recognize some of the main characteristics of these two general orientations about learning processes.

The stimulus response or conditioning theories typically have emphasized objective analyses of behavior as a means for deriving learning theories, and they usually have accepted the assumption that one can understand complex learning process best after one

has gained at least a fundamental understanding of the simpler learning processes. This assumption carries with it the expectation that understanding such simple processes can be accomplished more readily and that the findings and theories which result will have implications for explanations about more complex learning processes. Conditioning theories of learning have dominated much of the research and theory construction about learning processes and have attained such visibility within academic psychology that many would equate the term learning theory with some form of conditioning conceptualization. There are two main traditions from which most conditioning learning theories have been derived. One is generally referred to as instrumental conditioning and is derived from the work of Edward L. Thorndike[2]. In brief, the central assertion is that behavior is controlled by its consequences and that we learn to do that which produces pleasant effects and to avoid that which has unpleasant effects. The other major conditioning tradition is generally called classical conditioning and is derived primarily from the work of Ivan P. Pavlov[3]. This theory depicts the stimuli in the situation as prodding the organism into action. Previously neutral stimuli acquire their ability to control behavior and thus cause learning as result of being paired with stimulus which already has the capability of eliciting such a response. Most conditioning learning theories emphasize classical or instrumental conditioning, modify one of these two approaches, or provide some combination of these two orientations in developing a hybrid theory.

Cognitive theories of learning primarily emphasize complex intellectual process such as thinking, language, and problem solving as major aspects of the learning process. It has often been said that one can more readily identify what cognitive theories against than what are they are for. They are especially critically of learning theories which primarily emphasize simple learning processes as the basis from which one can derive explanations of more complex learning processes. In many respects, they attempt to describe learning as experienced by learner himself and thus they set for themselves the objective of understanding experience. Instead of looking for some kind of basic element – such as the reflex in behaviorism and the mental atom of structuralists – they contend that primary emphasis should be placed on how one organizes one's experiences of a situation and the way one learns alternative or more appropriate kinds of organizing experiences. In brief, cognitive theorists contend that humans learn cognitive structures or understanding rather than movements and that the behaviorists are merely looking at the results of learning rather than the process of learning when they focus on behavior.

Learning Styles

Students take in and process information in different ways: by seeing and hearing, reflecting and acting, reasoning logically and intuitively, analyzing and visualizing, steadily and in fits and starts. Teaching methods also vary. Some instructors lecture, other demonstrate or lead students to self-discovery. Some focus on principles and other others on applications. Some emphasize repetitions and others understandings. When mismatches exist between learning styles of most students in a class and the teaching styles of the professor, the students may become bored and inattentive in class, do poorly on tests, get discouraged about the courses, the curriculum, and themselves and in some

cases change to other curricula or drop out of school. The learning style model discussed in this paper was formulated by R. M. Felder and L. K. Silverman[4].

Active and Reflective Learners

Active learners tend to retain and understand information best by doing something active with it – discussing or applying it or explaining it to others. Reflective learners prefer to think about it. Active learners should be given a chance in class time for discussion or problem solving activities. On the other hand reflective learner should have chance to think about a concept or a material before new concepts or materials are introduced.

Sensing and Intuitive Learners

Sensing learners tend to like facts, intuitive learners often prefer discovering possibilities and relationships. Sensors often like solving problems by well established methods and dislike complications and surprises. Intuitors like innovation and dislike repetition. Sensors are more likely than intuitors to resent being tested on materials that has not been explicitly covered in class. Sensors tend to be patient with details and good at memorizing facts and doing hands-on work. Intuitors may be better at grasping new concepts and are often more comfortable than sensors with abstractions and mathematical formulations. Sensors tend to be more practical and careful than intuitors, intuitors tend to work faster and to be more innovative than sensors. Sensors do not like courses that have no apparent connection to the real world; intuitors do not like courses that involve a lot of memorization and routine calculations.

Visual and Verbal Learners

Visual learners remember best what they see – pictures, diagrams, flow charts, films etc. Verbal learners get more out of words – written and spoken explanations. Everyone learns more when information is presented both visually and verbally. Visual learners could be helped by providing diagrams, sketches, schematics, flow charts, other visual representations of the instruction materials. Verbal learners could be encouraged to write summaries and out lines of course materials in their own words. Also, working in group could be helpful to the verbal learners.

Sequential and Global Learners

Sequential learners tend to gain understanding in linear steps, with each step following logical from the previous one. Global learners tend to learn in jumps, absorbing material almost randomly. Sequential learners tend to follow logical stepwise paths in finding solutions. Global learners may be able to solve complex problems quickly or put things together in novel ways once they have grasped the big picture. Most college courses are taught in a sequential manner. Global learners could be helped by providing overall rational and summary of the course material.

Experiment

Ninety eight students at Farmingdale State College in construction management major were given the computer based questionnaire developed by Felder and Silverman[5]. This represents seventy percent of all the students in construction management major. There are forty four on line questions[6] (these are not opinion survey, but questions regarding the respondents reactions to certain situation) students need to response. The results returned are based on two dimensions (e.g. Active and Reflective) in one to eleven (1-11) scale. A score of 1-3 indicates fairly balanced on the two dimensions. A score of 5-7 indicates a moderate preference of one dimension of the scale, any score above 7 points a strong preference for that dimension of the scale.

Data

The followings are the data composed from the summary results obtained by the students. The percentages are rounded off.

Active			Reflective		
9-11	5-7	1-3	1-3	5-7	9-11
0%	15%	40%	30%	15%	0%

Sensing			Intuitive		
9-11	5-7	1-3	1-3	5-7	9-11
0%	20%	10%	15%	35%	20%

Visual			Verbal		
9-11	5-7	1-3	1-3	5-7	9-11
20%	55%	15%	10%	0%	0%

Sequential			Global		
9-11	5-7	1-3	1-3	5-7	9-11
0%	20%	20%	20%	30%	10%

Discussion

It is clear from the data collected that most of the students in construction management program at Farmingdale State College are visual learner. None of the other results give a clear cut idea about the learning styles of most of the students except there are some

indications that many of the same students do have moderate preference for intuitive and global learning styles. The results do follow general believe among faculty members how to best communicate to our students.

Conclusion

Although this moderate study did not add significant knowledge about our current students, it did validate to certain extent the faculty members' intuitive understanding of our own students. The next step of the study should now include actual learning outcome assessment based on modified teaching methods. It may not be practical to cater to individual group of students within a course, but the study should systematically measure the change in learning outcomes based on stepwise change in teaching styles.

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