The Relationship Between Cognitive Learning Styles and Distance Education

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Abstract

As the number of distance education programs increases, there is a greater need for understanding the impact of individual learning styles on student achievement in these programs. This article addresses the relationship between learning styles and distance education. It provides a description of individual learning styles using the Gregorc Style Delineator. Recommendations for practice are also addressed.

Introduction

The prevalence of distance education at 2-year and 4-year higher education institutions in the United States is steadily increasing (Snow, Farris, & Levin, 1999). The rise in popularity of distance education has increased the potential for many nontraditional and traditional students to participate in learning activities. One of the growing concerns regarding distance education is the ability of the student to retain the knowledge that is gained during the learning process. In order to address this concern, it is imperative to consider the learning styles of distance education students and their subsequent relation to the students learning and retention in distance education programs.

Learning Styles

In an effort to define learning styles in a cognative context Gregorc (1979) stated that "Learning style consists of distinctive behaviors which serve as indicators of how a person learns from and adapts to his environment. It also gives clues as to how a person's mind operates" (p. 234).

There are four primary domains of learning to be considered when addressing an individual's learning style. These domains are the cognitive domain, affective domain, psychomotor domain, and physiological domain. Bloom (1956) describes the cognitive domain as the acquisition of knowledge and ability to recall that knowledge for application. The affective domain addresses how individuals receive, respond to, and ultimately internalize stimulus emotionally (Bloom et al., 1973). The psychomotor domain uses physical activity as a way to gain knowledge and skills (Simpson, 1972). The physiological domain addresses how a learner's environment, and the many elements thereof, impacts their ability to learn (Dunn & Dunn, 1978).

There are many different assessments of learning styles available. The variety of assessments available leads to a variety of descriptions for the learning styles which it is measuring. For the purpose of this research paper, it will focus on the four dominant learning styles that are defined in the *Gregorc Style Delineator* (Gregorc, 1982). The *Gregorc Style Delineator* is a widely used assessment of cognitive learning styles (O'Brien, 1994). Additionally, there are studies supporting the validity and reliability of the instrument (Joniak & Isaksen, 1988; O'Brien, 1990).

The first learning style defined by Gregorc (1982) is the Concrete Sequential (CS) learner. The CS learner can be summed up as a realist. They view reality through the concrete world of the physical senses and prefer sequential steps to arrive at solutions to problems. Their thinking processes are very methodical and result in solutions that have been validated by personal proof or subject experts. Slightly resistive to change, the CS learner performs best in a learning environment which is ordered and stable.

Abstract Sequential (AS) is the second learning style defined by Gregorc (1982). The AS learner thinks in a logical and rational manner much like the CS learner does. However, the AS learner better associates abstract information that corresponds to concrete reality than the CS learner does. The AS learner is a logical thinker who requires a stimulating learning environment that is free of authoritative features which would restrict their freedom to learn.

The Abstract Random (AR) learner views the world primarily through their sense of feelings and emotions. These feelings and emotions drive their approach to change and often determine their level of interest in a topic or learning situation. An idealist by nature, the AR learner requires emotional and physical freedom in their environment to enhance their learning. AR learners live for today and often possess a colorful personality. They also place a great amount of emphasis on relationships (Gregorc, 1982).

The Concrete Random (CR) learner lives in a world that is influenced by the physical world and their sense of intuition. The physical world often serves as a starting point for their learning. Once started, CR learners will then rely on their intuition to guide their learning. CR persons are intuitive and independent learners. They learn best in a learning environment that has a high amount of stimulus and is free from learning restrictions. CR learners possess a good balance of realist and idealist qualities which enable them to cope well with changes to the learning environment (Gregorc, 1982).

Distance vs. On-Site Education

Is there a difference in learning outcomes between students enrolled in courses in the traditional on-site learning environment and those enrolled in distance education

courses? Do differences in learning styles have an impact on student performance in distance education? The studies described below were conducted to address these important factors.

The first study examined the differences in outcomes between two groups of students enrolled in the same course. One group attended a class on campus and the other participated in a distance education offering of the same course. Both groups received the same lessons, used the same books, and were given the same assignments (Aragon, Johnson, & Shaik, 2002).

The major differences between the two groups in the study revolved around interactions and discussions. While the traditional group participated in open classroom discussion, the discussions of the distance education participants occurred via email and real-time chat during a one-hour synchronous broadcast over the internet. Group work was conducted by both groups and there were no differences in the activities required between the two groups of students (Aragon, Johnson, & Shaik, 2002).

The results of the study indicate that there was no significant difference in learning outcomes between the two groups of students. The study did indicate that the students in the distance education course were significantly more reflective. This was attributed to their abilities to work more independently and at their own pace (Aragon, Johnson, & Shaik, 2002).

Simpson and Du (2004), examined the effects of learning styles on class participation and student enjoyment in distance learning. In this study, all of the participants were enrolled in a distance education course for the first time. Each participant's learning style was assessed at the beginning of the course. Their class participation and student enjoyment were measured at the end of the course.

The outcomes of Simpson and Du's (2004) study revealed a significant relationship between student learning style and their enjoyment level of the course. Learner's who prefer an active environment to reinforce the material received the most enjoyment out of the course. Learner's who were more reflective in nature enjoyed it the least. The study also showed that learning style was significant in explaining the level of student participation. Concrete learner's tended to be more active in the course than their abstract counterparts.

In a study conducted by Ross and Schulz (1999), the authors discovered that AR learners may not perform well in courses which use computer aided instruction. This study identified that the AR learner performed poorly compared to their counterparts in a Cardiopulmonary Resuscitation (CPR) certification course. It also revealed that

they spent less time with the program, used less of the instructional aid and interacted with the computer than their counterparts.

Implications for Practice

Some facet of each of the previously defined learning styles can be found in the results of the studies discussed above. This would indicate that all students have some potential for success in distance education. The key to success is not only in the learner, but also in the design of the course.

The design and implementation of distance education courses can be a major obstacle. The courses should require the same amount of work as a traditional course offering. This means that the instructor must design assignments, means of communication with students, and grading policies. Often times, these result in an increase in the amount of time spent on a course. A brief in class conversation can take much longer using electronic means of communication such as chat and e-mail (Howland & Moore, 2002). Course assignments must be written and posted which requires some level of technical proficiency.

Distance education courses must also be designed to keep the student engaged. One flaw of distance education is the excessive freedom students have to procrastinate in completing assignments (Howland & Moore, 2002). This may cause the student to fall behind in their coursework and subsequently reduce their learning outcomes and level of class enjoyment.

Technical difficulties can also be a hindrance in the administration of distance education. These technical difficulties may arise from the failure of equipment that is critical to the delivery of the material. Technical difficulties may also be personnel related. The instructor and all those involved in the administration of the course must be properly trained on the use of the equipment and methods that are necessary for conducting the course.

Conclusion

Ross and Schulz (1999) provide the following five tips for the effective and responsible use of technology in education. These guidelines will help both the student and the instructor maximize the effectiveness of instruction and level of retention that is achieved in any distance education program.

1. All computer aided instruction should be closely monitored. Take special care to ensure that outcomes are measured periodically and students should be given tasks to help keep them engaged.

2. Ask for student feedback on their learning experiences. Educators should also determine the learning styles of their students to determine the best approach for teaching the material.
3. Provide opportunities for group work to those students who may be reluctant to work alone via distance education. This may be especially helpful for the AR learners.
4. Be cautious of sweeping curriculum changes which may convert entire programs into distance education courses as this may alienate certain groups of learners.
5. Utilize multiple teaching strategies to ensure that students with differing learning styles are not alienated. An alternate method of delivery may be appropriate to prevent this from occurring.

In conclusion, the importance of understanding students learning styles is as applicable in distance education as it is in traditional classroom settings. By successfully assessing the student's learning style and presenting the material in a manner that matches their needs, both the student and the educator will strive for the desired outcomes.

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