Chapter 12

Personality Scales and Learning Styles: Pedagogy for Creating an Adaptive Web-Based Learning System

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ABSTRACT

There is a vast body of literature that indicates students not having homogeneous learning patterns. Just as the students vary, their learning styles, cognitive abilities, and learning preferences vary; similarly, instructors employ different teaching methods. Numerous researchers have hypothesized that when students’ unique learning dimensions are matched with similar teaching styles, it can have a significant positive impact in regards to students’ grasp on information, their satisfaction with the course, improved academic grades, and group/team interaction. However, it is rigorously debated what these dimensions are, if they are fixed or changeable, and which scale gives the most accurate purview into the various learning dimensions of students. This paper explores the behavior and learning style of the human mind and its capacity in different learning environment. The authors examine theory, similarities, differences, and implications of the five relevant learning models discussed in the paper. Analyzing and interpreting these learning styles and behaviors will help the reader employ the best scale or combination of scales that should be used in the creation of Web-based learning environments (WBLE) for students and adapting WBLE to their particular learning styles and preferences.

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INTRODUCTION

Learning is accomplished when the individual needs of learners are established well in advance. These needs include the learners’ prior knowledge, learning styles, and cognitive traits. The learning environment (whether classroom traditional teaching, virtual Web world, or any form of hybrid learning structures) must support the learners’ needs or else, they might have difficulties in learning. Web Based Learning Environments (WBLE), also called Web Based Learning Systems (WBLS), incorporate the process of ‘Adaptation’ and addressing rightly the cognitive traits and learning styles. By adapting the courses to the prior knowledge of the students helps them in learning and making learning easier for them. The ‘Adaptation’ process includes detecting the individual learning needs of learners and then adapting courses according to the identified needs and using individual differences as a basis of system’s adaptation (Magoulas et al., 2003; Kinshuk & Graf, 2007; Komlenov et al., 2010). When beginners are enrolled in a course that is more suited to advanced learners, they get anxious and tend to experience problems with the complexities in the course. On the other hand, when advanced learners are enrolled in a course meant for beginners, they will not be challenged to learn and excel. Hence, for designing and adapting courses in WBLS, it is important to understand the learners’ skills and match them with the right challenges through the right level of courses aimed at them and students can explicitly choose different paths through course contents or can be directed to different parts of the instructional material depending on the pace of their advancement in acquiring new knowledge.

This brings to light, the concept of achieving Flow in WBLS, an important pre-requisite for learning to take place. Flow is defined as the congruence of high skills and high challenges of the users above a critical threshold level (Csikszentmihalyi & Csikszentmihalyi, 1988); and the rationality behind the concept of “multi-activity” applies to the dynamic perceptions of challenges perceived in a given situation and the skills a person brings to it (Chen, Wigand, & Nilan, 1998). Web as a medium of instruction, is more geared to human cognitive architecture. It is beneficial to incorporate the differences in cognitive architecture given in psychology related theories in order to avoid cognitive overload and facilitate learning for students with weak cognitive abilities.

Research has pointed out that learners with strong learning preference for a specific learning style might have trouble in learning if their learning style is not supported by the appropriate teaching environment (Eysink et al., 2009; Own, 2010; Komlenov et al., 2010; Graf et al., 2010). Gaffikin and Perry’s (2009) study empirically assesses the organizational priorities with respect to the objectives and practices of U.S. research universities in the context of being globally adaptive to dominant trends, finding that they are playing a key role in the formal representation of the institutional direction, goals, and values of American higher education. Cognitive traits do not change with time and remain more or less stable. Changing learning styles requires training for the weak learning preferences in order to enhance them; which means even learning style is stable over time. Developing a proper technology enhanced learning environment is a key to enhance learning and making learning accessible to all learners by incorporating their individual cognitive traits and learning styles, through the concept of adaptation.

This research is different from other past researches because it combines psychological learning (cognitive) theories with application and proposes to develop a live technology based WBLS which can be implemented across the world. The research focuses on the comparison of various learning styles and preferences of the learners in various learning environments and fulfilling the gaps in learning and teaching styles through Web Based Learning Systems (WBLS). Next, we analyze the relevant learning and intelligence theories.
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