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Transforming the Pedagogical Landscape with Digital Initiatives

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Abstract: *The advent of digital technology has changed the learning environment in the classroom. However, the mere inclusion of technology in the educational process is not enough – the question of what teachers need to know about technology for its judicious use in the teaching-learning process, is more important. This Study was conducted to identify student preferences in assimilation and processing of information; the findings established the diversity of learning styles and the consequent need for instructors to design instruction accordingly. The introduction of e-learning has forced educators to reconsider core pedagogical issues and become intelligent users of technology for effective pedagogic practices. Central to all these is understanding the complex relationship between content, pedagogy and technology but above all, the learner, and ensuring his active engagement with the learning process. It also highlights the need to update teacher understanding and application of the newer developments via 'organized pedagogical training' at Higher Education levels.*

Keywords: Learning styles, diversity, pedagogical training, instructional design, Higher Education

I. INTRODUCTION

A major theoretical development in recent education research is the move towards a more 'constructivist perspective' and how people actually learn. Across the world, the recent trends in practice of teaching and learning are from a behaviorist view to a more constructivist and developmental view where students are more actively engaged in the learning process. Recognition that students must be more active participants in the learning process, wherever possible, stems from the aim of promoting deeper processing of knowledge. Higher education in science should develop a broad perspective on the chosen discipline, an in-depth understanding, the ability to see relationships, to have to have an inquiring mind, exercise independent judgment and have an analytic and creative approach (King, 2004).

What has been most productive in the learner-centered tradition has been the additional insight gained about individual differences and strategies that emerge while learners are engaged in the process of learning. Jonassen and Wang (1993) concluded that merely providing information and showing students structural relationships is not sufficient for higher cognitive performance. They concluded that "what matters most is the construction of personally relevant knowledge structures" (p.7). Learning improves when learning styles are taken into account (Riding & Rayner,1995; Riding & Douglas 1993).Research has also revealed that teaching students how to learn and how to monitor and manage their own learning styles is crucial to academic success (Mathews, 1991; Biggs and More,1993). When permitted to learn difficult academic information or skills through their identified preferences, students tend to achieve statistically higher test and attitude scores than when instruction is dissonant with their preferences. Moreover, knowing their learning preferences can be both empowering and transformative and thus students should be given insights into their possible learning strengths and weaknesses.

The review of related literature further revealed that addressing learner needs as a basis for providing responsive instruction has never been more important than now as educators meet the needs of diverse student populations. To identify and address their students' learning styles (Beaty, 1986, Dunn et al.1989) teachers must employ a reliable and valid learning style preference instrument (Curry, 1987). In India too, there is need for well trained faculty who will improve instruction to produce quality graduates. The existing teacher training programs in Indian Universities are insufficient both in number and the aspects that they cover to meet this demand (Bansal &Supe, 2007). Thus, globally,

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the focus has shifted from concentrating on the constructs of intelligence and information processing to an increased interest in learners' active response to the learning task and learning environment (Riding & Rayner, 1995).

These concerns prompted the researcher to take up this Study; to determine the preferred learning styles of undergraduate science students who are at the threshold of a very crucial period of their lives; one which allows them to expand their knowledge and skills, grasp abstract concepts and theories and increase their understanding of the world around them.

The present Study was conducted with the objective of determining the preferred learning styles of first year undergraduate science students in a private University in Mumbai, Maharashtra, India. This was done via the implementation of the VARK scale (learning style inventories include models described by various educationists such as Dunn and Dunn, Felder-Silverman, Honey and Murnford, Kolb and VARK which was introduced by Fleming in 2006. VARK is an acronym which stands for visual, aural, read/write and kinesthetic preference modalities) and finding out the percentage of students in each category of learning style.

II. METHOD

Ethics – Due consent was obtained from the respondents and complete anonymity maintained during data collection.

Tool employed – The 16 multiple choice VARK questionnaire version 7.1 [Copyright (2006) held by Neil D. Fleming, Christchurch, New Zealand and Charles C. Bonwell, Green Mountain Falls, Colorado 80819, USA] was implemented. It was downloaded from the VARK home page http://www.vark-learn.com/english/page.asp?p=questionnaire.

Study procedure – The first year undergraduate Science students (100) were briefed about the objective of the Study and responses were elicited regarding their learning preferences i.e. visual, aural, read/write, kinesthetic.

III. ANALYSIS

Quantitative Analysis

The responses received were then tabulated into a Microsoft Excel sheet and the scores were statistically analyzed to determine the percentage of students in each category via percentage analysis.

IV. FINDINGS

Figure 1 below shows the learning preferences among undergraduate science students. The statistical analysis revealed that unimodal learners were only 9% while the other learning preferences were bimodal 33%; trimodal 30%; quadrimodal 28%. Mode refers to the specific learning preferences which could be one mode (visual, auditory, read-write, kinesthetic) or a combination of these. Scores were given accordingly. The findings of the Study clearly revealed individual differences in learning styles.

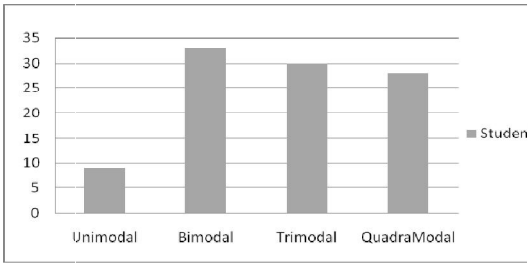

Fig. Learning preferences among undergraduate science students

V. IMPLICATION OF THE FINDINGS

This Study was conducted to identify student preferences in assimilation and processing of information; the findings established the diversity of learning styles and the consequent need for instructors to design instruction accordingly.

Institutions of Higher Education must address the all important issue of whether or not they meet the needs of learners. The advent of digital technology has changed the learning environment in the classroom and helped to address this issue of differentiated instruction. Technology has forced educators to reconsider core pedagogical issues and become intelligent users of technology for effective pedagogic practices. Central to all these is the understanding of the complex

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relationship between content, pedagogy and technology but above all, the learner and ensuring his active engagement with the learning process.

It also highlights the need to update teacher understanding and application of the newer developments via 'organized pedagogical training' at Higher Education levels and then use these findings to design e-content for effective instruction. Such efforts would give our everyday endeavors more direction and meaning. Moreover, by giving learners exposure to a multitude of learning experiences, we would be addressing the much advocated 'differentiated instruction' via the manipulation of a variety of symbol systems – visual, acoustic, textual and numerical not to mention the recent advances done in the area of virtual/simulated experiences which provide necessary learning experiences in the virtual world.

Post the conducting of this Study, an attempt towards the same was made by developing e-content for Science subject (Biochemistry) adapting to the unique needs of the learner. This Project has now been uploaded on the national portal for undergraduate learners.

VI. CONCLUSION

The findings of the Study clearly revealed individual differences in learning styles thus implying that learning materials need to be evaluated in terms of learner styles and preferences so that instructional designers are sensitized to the needs and cognitive styles of the learners and become more responsive to these needs during the designing of instructional materials. Adapting academic materials to learning styles will facilitate learning and thereby help increase learning especially for low and moderate achieving students (Zin, Zaman &Noah, 2002). Most importantly, findings of such research studies would provide insights to improve learning in both traditional and e-learning settings.

We, in academia, must continuously question our educational practices and via research collectively expand our vision towards transforming and enriching 'learning'. The Study is an attempt to challenge stereotypical notions about learning and gradually enrich the pedagogical landscape with digital initiatives.

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