



Integrated Learning Outcome Approach

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Abstract

The learning outcomes are primarily evaluated based on written examinations in India. The purpose of exams is to test the measurable skills, abilities, knowledge or values that students should be able to demonstrate as a result of a completing a course. There are various learning styles which appeal to different students of different psychological dispensation. These days, even teaching faculty use a mixed-method approach to learning which improves the learning capabilities of those students who prefer non-traditional modes of learning. Even though there has been a significant transition in terms of adaptation of a variety of learning styles, we are still struck with an archaic mode of written examination which commands the bulk of the weightage in the evaluation of learning outcomes on completing a course. This paper will explore the relevance of a mixed learning outcome approach by delineating the importance of equal weightage to others forms of learning outcome evaluation other than written examination.

Keywords: Learning outcomes, learning style, II PUC score, VARK (Visual, Aural, Read/Write, Kinesthetic).



Introduction

Learning styles have been defined as the composite cognitive, affective, and physiological characteristics that are relatively stable indicators of how a learner perceives, interacts with and responds to the learning environment (Keefe, 1987). Humans assimilate knowledge about the environment through four sensory modalities: Visual (observing pictures, symbols or diagrams), auditory (listening, discussing), visual/iconic (reading and writing), and kinesthetic (using tactile sensory abilities such as smell and touch) (Bruner, 1982; Norman, 2009).

Learning outcomes refer to observable and measurable

- knowledge
- skills
- attitudes

Learning outcomes describe significant and essential learning that learners have achieved, and can reliably demonstrate at the end of a course or program.

Written exams undoubtedly have their place and purpose in the evaluation of learning outcomes. However, in the present context of Indian pedagogy, written examination has become a process of quantification of people's learning outcomes on the basis of the accuracy of the regurgitated information onto a page which they have retained over the academic semester/year. As stated above, there are 4 basic learning style preferences which are represented by the acronym VARK and among these; read/write learning style preference is the one that is the closest correlative representative to the written exam method of evaluating learning outcomes. Along with written exams; Indian pedagogical evaluation system also includes viva voce, projects, presentations, and internships but their significance in the learning outcome evaluation is not substantial when compared to the weightage commanded by written examination. In the recent past, the mixed learning styles approach has been widely accepted in the Indian pedagogy but the evaluation of



learning outcomes from various learning styles approach narrows down at the end towards a myopic written examination method of evaluation.

This study will explore the most common and least common preferred learning style in a sample size of 60 students and the results of this study can be extrapolated towards understanding the relevance of a mixed learning outcome approach and improving future interventions.

Review of Literature

Spady (1994) an educational researcher who spearheaded the development of outcomes based education, suggests that the ability demonstrate learning is the key point. This demonstration of learning involves a performance of some kind in order to show significant learning, or learning that matters. He claims that significant content is essential, but that content alone is insufficient as an outcome. Rather, knowledge of content must be manifested through a demonstration process of some kind.

Spady, also addresses the context or performance setting in which the performance demonstration occurs. He suggests a range of performance contexts from that of demonstrations of classroom learning to those which involve living successfully in the larger society. Thus, his highest level outcomes refer to generic skills such as the preparation of learners to be problem solvers, planners, creators, learners and thinkers, communicators etc., regardless of subject areas studied (Lesch, 2012).

According to Fleming (1995), students with a visual preference learn best from presentation of materials using graphs, charts and diagrams; aural learners prefer to receive information through listening; read/write learners prefer to take in information through writing and reading from printed words; kinesthetic learners gain better understanding of materials through concrete examples and applications. The most recent version of the VARK questionnaire consists of 16



questions and identifies a person's preferred method or mode of presenting and processing information.

Some studies showed no gender difference in the numbers or types of sensory differences (Bhaskar, 2011; Slater, Lujan, and DiCarlo, 2007), while others found gender differences in learning style preferences (Dobson, 2010; Rogers, 2009). Attempts have also been made to identify the relationship between VARK learning style preferences and student performance in university courses. For example, Dobson (2010) found that a strong kinesthetic learning style had a significant negative relationship with performance in physiology courses among a sample of 64 students; but Eudoxie (2011) found no significant relationship between VARK learning style preferences and course performance among a sample of 62 students studying soil management science. Other studies used the VARK inventory to show that understanding students' learning style preferences can help to improve the communication of course materials and the educational experience of students. (Dobson, 2010; Rogers, 2009).

Boatman, Courtney, and Lee (2008) used the VARK inventory of learning styles developed by Fleming and Mills (1992) to assess the relationship between student learning styles and their performance among 211 students from a mix of introductory microeconomics and introductory macroeconomics courses. They conclude that students who are visual learners perform better in introductory economics courses and suggest that this result is partly due to the fact that a significant portion of the concepts are taught using a graphical analysis approach. Another observation made by the authors is that once students' learning styles have been addressed, there appears to be no gender-based differences in student performance in introductory economics. This is an interesting point because such finding seems to be consistent with the suggestions from earlier literature in that gender has been found to have no significant relationship with performance in principles of economics courses once personality types are accounted for (Borg and Shapiro, 1996; Ziegert, 2000).

A cross-sectional study was conducted among 600 medical students at King Saud University in Riyadh, Kingdom of Saudi Arabia from October 2012 to July 2013. The Visual, Aural, Read/Write, and Kinesthetic questionnaire (VARK) questionnaire was used to categorize learning style preferences. Descriptive and analytical statistics were used to identify the learning style preferences of medical students and their relationship to academic achievement, gender, marital status, residency, different teaching curricula, and study resources (for example, teachers' PowerPoint slides, textbooks, and journals). The results indicated that 261 students (43%) preferred to learn using all VARK modalities. There was a significant difference in learning style preferences between genders ($p=0.028$). The relationship between learning style preferences and students in different teaching curricula was also statistically significant ($p=0.047$). However, learning style preferences are not related to a student's academic achievements, marital status, residency, or study resources (for example, teachers' PowerPoint slides, textbooks, and journals). Also, after being adjusted to other studies' variables, the learning style preferences were not related to GPA.

Objective

The present study aims at determining the correlation between the marks obtained in the II PUC exams with the preferred learning style of the individual.

Hypothesis

1. Read/Write is one of the least preferred learning styles.
2. Written examination is not one of the most efficient methods to assess learning outcome of individuals with varied learning style preferences.



Method

A sample of 60 (30 males and 30 females) students from St Pauls College participated in this study. The entirety of sample size belonged to the age bracket of 18 to 21. All the necessary prerequisite consent and permission required for the study was obtained from the students as well as the college management. The students were administered the Learning Style Inventory by Dr. S.V. Surya Rekha to assess their preferred learning styles. The preferred learning style was then correlated with the score obtained in II PUC exams. Student narratives were also collected in the form of student interviews and brief notes were prepared for each of the individual interviews. Qualitative analysis of the data was done.

Student Interviews

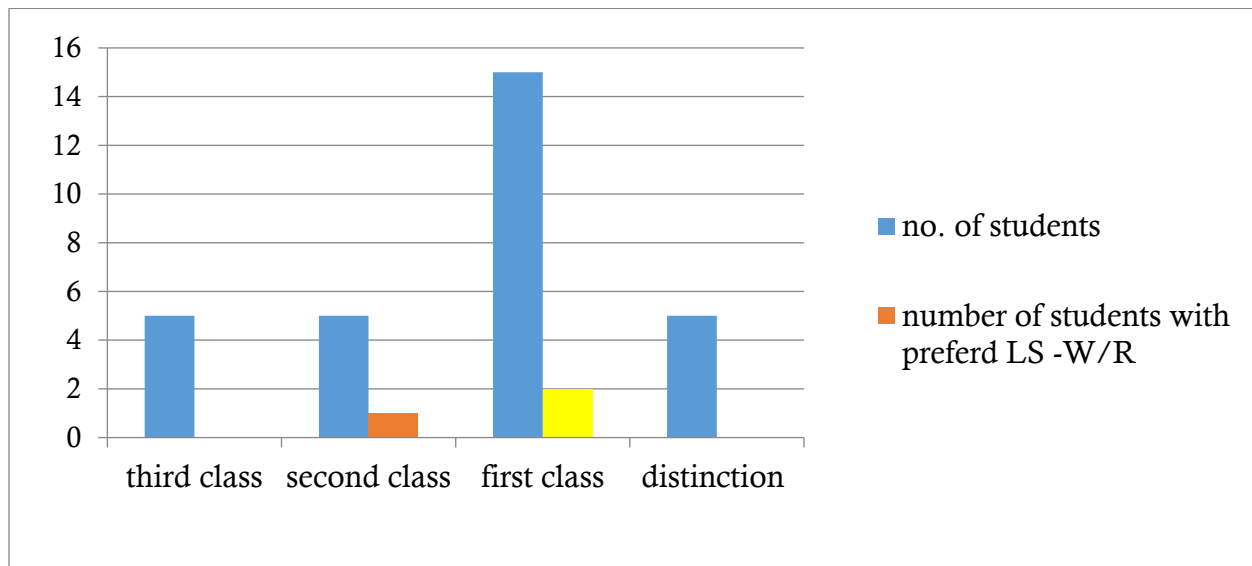
An interview for an in-depth and nuanced understanding of the students' preferred learning style was conducted. This was one of the components used for overall evaluation and for effectiveness in improving future interventions. 6 students were interviewed. Students interviewed were selected across 4 PUC score segments; 2 students (a boy and a girl) per segment. They were interviewed one-on-one in an empty classroom. A brief written account of the interview was noted. The interviewer asked the interviewees for an elaborative narrative, describing their preferred mode of learning style, methods chosen by them for preparation for exams (II PUC), extent of recollection of the past learned syllabi, social pressures, parental guidance and barriers in learning and exam performance. Through the interview; the motivational level, the preferences and barriers of individual students were noted. It was inferred that the students who scored high scores even with low preference for read/write learning style were highly motivated by personal, parental and societal reasons and also didn't find it too difficult to learn in their low preferred learning styles.

Results & Interpretation

The below noted data showcases information collected for 30 boys in the sample group.

Boys

Marks	No. of Students	Number of students with preferred LS –R/W
Third Class	5	0
Second Class	5	1
First Class	15	2
Distinction	5	0



Learning Styles	Mean±SD
V	7.7 ±1.82
A	7.1±1.85
R	5.5±2.58



K	6.3±2.34
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The above table and graph gives the data about number of students in each rank division (rank division based on PU board rank classification). It also shows the number of students who with learning style preference of Read/Write. In first class division 2 out of 15 students have preferred LS of R/W. On personal interaction in the form of student interviews, it was verified that these two individuals exhibited high motivation level for academic performance.

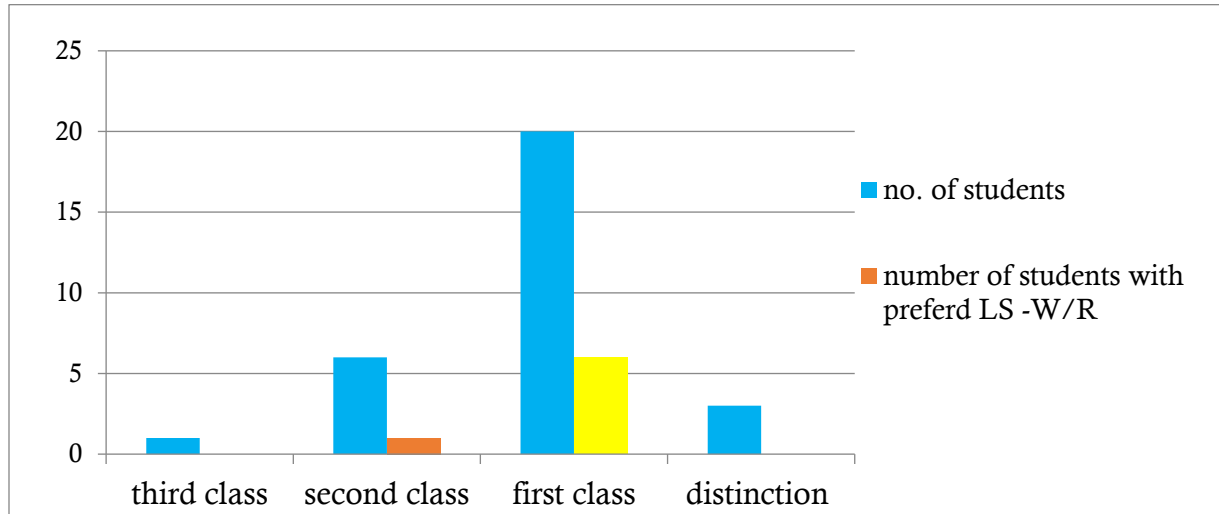
Totally out of 30 students 3 students i.e., 10% have learning style preference of Read/Write. Students across all spectrums of PUC score divisions showed varied preferences of learning style. The mean score of R/W is lowest among mean scores of VARK.

The below noted data showcases information collected for 30 girls in the sample group.

Girls

Marks	No. of Students	Number of students with preferred LS –R/W
Third Class	1	0
Second Class	6	1
First Class	20	6

Distinction	3	0
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Learning Styles	Mean±SD
V	5.6 ± 2.1
A	5.8± 2.02
R	4.8±2.05
K	4.5±1.75

6 out of 20 students who have secured first class have learning style preference of Read/Write. Again the motivational factor for marks was relatively high among students who scored high marks with low learning style preference for Read/Write. Across the division 23% have R/W as their preferred learning style. The mean score here also reflects that R/W is not the foremost preferred style.

Limitations of the Study



This paper begins with a small number of sample size which is more homogeneous. The study will benefit from a bigger and more heterogeneous sample size. Since, there are multiple factors like intelligence, emotional maturity and stability, stable parenting and nurturing environment contribute in the learning and exam performance of individual students. This study would greatly benefit from careful consideration of each of the contributing factors and ultimately contribute to the ever expanding galaxy of scientific knowledge.

Conclusion

Visual has the highest mean score among boys and Aural among girls. This depicts the varied preferred LS among students and specifically the low preference for R/W. Since teaching faculty has widely adopted mixed learning style approach to enhance learning, it would only make sense to evaluate its outcome based on mixed learning outcome approach. Unlike viva voce, projects, presentation, and internships; written examination fails in certain domain in examining the different skills picked up by the students as well as proves as a hindrance for students with low preference for R/W learning style. Equal weightage for multiple evaluation methods will boost the confidence of students with varied learning style preferences and also bring about a more accurate and efficient measures of learning outcomes which is the goal of any education system.



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