Classroom Ecology and Students’ Learning Style: A Study in an Elite Professional College

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Abstract

The study was conducted on a sample of students (n=277) enrolled in an elite professional institute to identify variation in learning styles. Classroom ecology and teaching styles were regressed on the learning styles. Students had more choice of strategic learning style followed by deep learning style. Students opted for deep learning style when teachers adopted student-centric approach to teaching. They had more choice for strategic learning style in case of teacher-centric mode of teaching. Teacher-centric approach to teaching followed by poor relationship with the roommate led to surface learning style by students. A significant difference between general category and the disadvantaged group of students was noted on deep learning style. The remaining learning styles did not make any difference across social category.

Keywords: learning style, teaching-learning, classroom ecology, teacher

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Introduction

For the last few years pedagogues have paid adequate attention on learning styles for improving performance of students in higher education. Teachers try to understand differences in learning behaviour of their students for ensuring better knowledge-based performance matrix (Manikutty, Anuradha and Hansen, 2007). They create classroom ecology at various levels of teaching. Students learn better when the contents are delivered in their preferred learning style (Entwistle, Hanley and Hounsell, 1979). Best teaching practices converge with multiple dimensions of learning styles. Previous studies (Singh, 2017) on an elite professional college revealed that about 23 per cent students across social category had backlog in more than three papers during 2012-16. Of them the disadvantaged group of students and tribal students separately had more backlog in papers between I-IV semester. Altogether 397 students were found repeaters in regular undergraduate programmes during the same session. This was a reflection of learning process which did not match the teaching styles. “Increasing access, without increasing chances of success, is becoming a new form of social exclusion within higher education” (Wilson-Strydom, 2011, p.407). Taking a lead from previous findings the study was designed to identify learning styles of students enrolled in different courses of an elite professional college. The elite professional colleges of India follow rigorous process of admission and hence, get meritorious students who contribute to ‘make in India’ (Singh, 2017). These professional colleges often known as an ‘island of excellence’ are public institutions. They adhere to the inclusive admission policy and promote learning through active behaviour (Singh, 2017a). Teachers generate learning environment and socialise their students to adapt to pedagogy of technical education. Another purpose of the study was to assess impact of classroom ecology and teaching styles on learning styles of students enrolled in the professional elite college. It is presumed that prestigious professional institutions often, discourage adaptive learning and promote generative learning. Prestigious professional colleges in India try to establish an optimum match between the learning styles and the teaching styles in a highly competitive environment.

Researches in past on learning styles are broadly based on two popular models- Kolb and Entwistle. How students construct their ideas, whether through concrete experience or abstract conceptualisation and how they process these ideas further: through active experimentation or reflective observation (Kolb, 1984)? These two dimensions though independent of each other, generate four learning styles: a. convergence, b. divergence, c. assimilation and d. accommodation. The major problem is that experiential learning is not the only way students learn; other ways such as information assimilation and memorisation exist and are very important, especially in classroom situations (Jarvis, 1987). The second stream of research on
learning style (Entwistle, Hanley and Hounsell, 1979; Entwistle and Tait, 1995; Entwistle, Tait, and McCunne, 2000) revolves around the idea that learning environment and teaching-learning processes (TLP) determine modes of learning. Entwistle and Wilson (1970) identified two kinds of motivation for learning: achievement orientation and fear of failure. Entwistle, Hanley and Hounsell (1979) explain three categories of learning: deep, surface apathetic and strategic. Deep learning entails an interest in new ideas and a willingness to explore them in-depth. It involves a combination of reflective as well as active learning. The surface apathetic approach is characterised by learners tending to focus on memorisation, being extrinsically motivated by the fear of failure and focus strictly on the task at hand. Learners tend to be bound to the syllabus and typically gain only a shallow understanding of the subject. Strategic learners attempt to secure the highest possible grades or other rewards, serving their own set of objectives. They identify assessment criteria for courses and then, adopt the appropriate study methods. Studies in past reflect variation in teaching styles and learning styles (Wong, 2004). Chinese and Japanese teachers had much lighter teaching loads than the Western teachers enabling them to have more time with students outside the class. Chinese students were generally quiet in class and were taught not to question or challenge their teachers. Asian learners used the rote-learning strategy because of their practice of memorisation which did not enhance understanding (Wong, 2004). Taiwanese learners gave priority to reproduction of written work and factual knowledge with little or no emphasis on critical thinking. The Australian education system encouraged students to be critical thinkers, often giving them opportunities to generate questions in their mind. Wong (2004) in a comparative study reported that Indian as well as Chinese students were more reflective learners. Staub and Stern (2002) in a study reported that Asian students were passive learners.

In student-centric teaching method teachers put more emphasis on collaborative learning (Hofstede and Hofstede, 2001, 2005). Students showed their engagement with issues and applied their understanding to the surroundings in student-centric model of teaching, got involved in the classroom debate and discussion. In teacher-centric model teachers transmitted contents to their students and thereby, limiting students’ opportunities to engage academically with the issues. Teachers at their own level defined parameters for participation in their classroom proceedings (Clark, 2003). They kept asking questions as if they were authority and had command over all valid knowledge. Thus, a limited inclusion of students in classroom transaction was noted; though appropriate students’ knowledge as an integral part of instruction was missing (Singh, 2017a). Getting a cue from previous studies the study focused on Enwistle’ approach to learning style.

Hypotheses. A set of hypotheses were framed.

Hypothesis 1: In an adaptive learning environment teacher-centric mode of teaching will lead to the strategic learning.
In the prestigious professional colleges students try to secure the highest possible grades or ranks that help get a lucrative job. This is possible when they organize their studies, select appropriate methods of preparation and follow instruction suggested by teachers. It helps students relate the concepts.

**Hypothesis 2**: *Student-centric instructional teaching under democratic classroom ecology will promote deep learning.*

Learning takes place through active behavior of the students: it is what he does that he learns not what the teacher does. Teaching-learning processes in the prestigious colleges make learning more pragmatic. Teachers pay attention to them, encourage them to resolve their problems and ask them to apply their skills and understanding (Entwistle, Hanley and Hounsell, 1979). It is the highest level of teaching where a teacher helps students abstract, hypothesise and theorise the concept. It promotes deep learning.

**Hypothesis 3**: *Students from various social categories will differ in terms of learning styles.*

Because of more emphasis upon inclusive education policy that took place in India, a large number of students from the disadvantaged groups have made their presence felt in the prestigious professional colleges (Singh, 2017). It does not mean that they ensure successful performance in the academic programme leading to a disguised form of social exclusion (Sen, 1999). To get entry at the prestigious institution and then, successfully perform are two different things. It makes a difference between capabilities and functioning. Students from the disadvantaged groups opt for managing the academic business but not for academic excellence. Outcomes/achievements do not necessarily provide sufficient information to understand how well someone is really doing (Nussbaum, 2011; Sen, 1985; Wilson-Strydom, 2011, p. 401).

**Method**

**Sample.** Altogether 277 students constituting four social categories (general groups 121, backward social groups 78, the disadvantaged social groups 42, tribal groups 36) from 19 academic departments of a prestigious professional institute participated in the study. Branch wise and category wise they were proportionately selected for the study. They were enrolled either in B. Tech (Hons.) or both B. Tech and M. Tech dual degree programmes. Students of 1st semester were not included in the study because of least exposure to the campus activities. About 23 per cent students across social category constituted the representative sample out of total enrolment (chi square p > .05).

**Measurement.** The study followed Entwistle’s model of learning styles. The investigator developed all three scales based on contextual requirements. Since the scales were
presumed multidimensional, factor analysis of each scale was separately computed by the principal axes method followed by non-oblique method to get orthogonal factor. Factors were extracted till Eigen value was more than one. It was noted that some items had significant loading on more than one factor. They were closely scrutinized and were retained on those factors where either they had highest loading or to which they seemed to belong in terms of the meaning. All measures were 4-point scale.

**Learning Style Scale (LSS).** A set of 22 items of the scale (Singh, 2017a) generated three factors-deep learning, strategic learning and surface learning accounting for 73.66 per cent of the total variances. The Eigen values of these factors were 3.94, 3.47 and 3.16. The alpha coefficient computed for each factor was .79, .68 and .65 respectively. Some items were: factor I (deep learning): I am able to explain things which I learn (.75), factor II (strategic learning): I distribute my study hours to all papers (.73) and factor III (surface learning): I study because I have to pass the exam (.66).

**Teaching Style Scale (TLS).** This scale having 22 items resulted in two interpretable factors-teacher-centric and student-centric accounting for 66.42 per cent of the total variances (Singh, 2017a). The Eigen values of the both factors were 4.88 and 4.07 respectively. The alpha coefficients of the factors were .77 and .66. A few items with loading were: Factor I (teacher-centric process)-teachers never go beyond the prescribed syllabus (.76) and Factor II (student-centric process)-they work out our problems even in the leisure period (.65).

**Classroom Ecology Scale (CES).** The scale having 24 items gave rise to two orthogonal factors-discovering and encouraging explaining 71.86 per cent of the total variances (Singh, 2017a). The Eigen values of the both factors were 4.27 and 3.77 respectively. The alpha coefficients computed for both factors were .76 and .69. A few items of discovering were: teachers incorporate activities for students to apply new knowledge (.72) Similarly, encouraging loaded some items like: teachers encourage all students to express their thought (.69). The loadings and other details of all factors of each scale are reported in table 2.

**Data Collection.** Students residing in various hostels were conveniently approached. Teachers also provided sufficient information about the teaching-learning processes and classroom practices. It took about six months.

**Results**

Students across category were found to have more choice of strategic learning style followed by deep learning style (table 1). On the other side, students from the disadvantaged groups opted
for surface learning (mean=3.12) as compared to general category students (mean=2.87). Tribal students (mean=3.03) had an edge over the disadvantaged groups (mean=2.96) while opting for strategic learning style. Both groups had less choice for deep learning. Students from backward social groups consistently followed all three styles with least variation. An overall difference on deep learning style among social groups was noted ($p < .05$). More specifically, the general category and the disadvantaged group students differed on deep learning style ($p < .01$). On the other side, no differences were recorded on strategic and surface learning styles among students across category ($p > .05$). Hence, hypothesis 3 got partially supported.

Table 1: Difference Between Learning Styles Among Students of Social Category

<table>
<thead>
<tr>
<th>Category</th>
<th>Deep learning</th>
<th>Strategic learning</th>
<th>Surface learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>General groups (n =121)</td>
<td>3.19**(.76)</td>
<td>3.28 (.95)</td>
<td>2.87 (.77)</td>
</tr>
<tr>
<td>Backward social groups (n =78)</td>
<td>3.07 (.93)</td>
<td>3.12 (.97)</td>
<td>3.07 (.76)</td>
</tr>
<tr>
<td>The socially disadvantaged groups (n=42)</td>
<td>2.73**(.86)</td>
<td>2.96 (.79)</td>
<td>3.12 (1.02)</td>
</tr>
<tr>
<td>Tribal social groups (n=36)</td>
<td>2.81(1.02)</td>
<td>3.03 (.84)</td>
<td>2.98 (1.03)</td>
</tr>
<tr>
<td>F-value (3, 273)</td>
<td>4.19* p &lt; .01</td>
<td>2.01 p &gt; .05</td>
<td>1.98 p &gt; .05</td>
</tr>
</tbody>
</table>

*note. Mean values of learning style are reported. Figure in parenthesis against category and learning style indicates number of respondents and SD respectively; response measured on 4-point scale. Newman-keuls test was computed to assess difference between groups.

** Difference between general category and the disadvantaged group students on deep learning was significant at .01 level; * significant at .05 level.

Manikutty, Anuradha and Hansen (2007) identified a pattern of deep, surface and strategic learning behavior. Deep learners exploited learning opportunities in many ways. Strategic learners had very specific goals. They had a well-planned time distribution for their study and accordingly, had an advance preparation for regular assessment. Probably, it was one of the reasons for a choice of strategic learning. Surface learners adopted shortcut way of success and hence, could not cope with academic stress. All three learning styles in various combinations were functional among students, depending upon their liking or disliking the subjects for which they had shown their interest.

An analysis of teaching style suggested that teacher-centric style (proportional mean=3.38) was more prominent in the institute. It did not mean that teachers were not
employing student-centric process (proportional mean=3.18). They tried to get students of the disadvantaged groups involved in learning processes. The study revealed that teachers worked out their problems even out of the class, if required. They used to monitor academic affairs during the off-period and encouraged them to explore some alternative solutions (student-centric). Remarkably, students who had frequent interaction with their teachers took advantages of this situation. Such students did not hesitate to go to their teachers’ residence for asking questions (table 2).

Table 2: Mean, SD and Proportional Mean with Rank of All Factors

<table>
<thead>
<tr>
<th>Dimension</th>
<th>range of mean scores</th>
<th>range of loading on items</th>
<th>range of SD</th>
<th>proportional mean</th>
<th>rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher-centric (10)</td>
<td>3.34-3.42</td>
<td>.51-.78</td>
<td>.68-1.04</td>
<td>3.38</td>
<td>1</td>
</tr>
<tr>
<td>Learner-centric (12)</td>
<td>3.15-3.35</td>
<td>.53-.74</td>
<td>.66-1.07</td>
<td>3.18</td>
<td>2</td>
</tr>
<tr>
<td>Discovering (14)</td>
<td>3.18-3.58</td>
<td>.52-.77</td>
<td>.55-1.07</td>
<td>3.19</td>
<td>1</td>
</tr>
<tr>
<td>Encouraging (10)</td>
<td>3.08-3.33</td>
<td>.58-.71</td>
<td>.57-.96</td>
<td>3.16</td>
<td>2</td>
</tr>
<tr>
<td>Deep learning (7)</td>
<td>3.29-3.47</td>
<td>.65-.77</td>
<td>.72-1.14</td>
<td>3.28</td>
<td>1</td>
</tr>
<tr>
<td>Strategic learning (8)</td>
<td>2.72-3.17</td>
<td>.59-.75</td>
<td>.64-.98</td>
<td>2.86</td>
<td>2</td>
</tr>
<tr>
<td>Surface learning (7)</td>
<td>2.66-3.05</td>
<td>.56-.68</td>
<td>.58-1.06</td>
<td>2.82</td>
<td>3</td>
</tr>
</tbody>
</table>

*note. Figures in parenthesis against dimension show number of items.*

An attempt was made to capture classroom ecology. Two prominent dimensions emerged out of factor analysis in the study were: discovering and encouraging. The discovering classroom ecology (proportional mean=3.19) was more prominent in the professional elite college which included many teaching practices such as setting high expectations for students’ performance, incorporating activities for students to apply new knowledge, providing opportunities for independent or group learning in the classroom, allowing all students to discover key ideas individually, employing brainstorming techniques in some cases, asking questions for drawing inferences from data, providing opportunities for all to conceptualize learning experiences, etc. Another prominent factor of the classroom ecology was ‘encouragement’ (proportional mean=3.16). Teachers continued encouraging all to judge variation in learning situations, promoting all in the exploration of diverse points of view to reframe ideas, motivating all students for multiple interpretations of some problems, encouraging all to reflect on the concept thrown by the teachers, motivating all to gather multiple sources of data for solving some problem, throwing a challenge to all students in solution-finding activities, etc.
**Predicting Learning Style.** Altogether three predictors namely, student-centric process followed by challenging classroom ecology and relationship with roommate significantly contributed to deep learning style. An overall $F(7, 270)$ was found significant $3.64, p < .01$. The coefficient of multiple $R$ was $.67$ suggesting $44$ per cent of the total variance on deep learning style was accounted for by the predictors in question. The pattern of results revealed that student-centric process emerged as prominent predictor explaining deep learning style, $F(1, 270) 4.67, p <.01$. Challenging classroom ecology was another predictor that significantly determined deep learning, $F(1,270) 4.59, p <.01$. Relationship with roommate had a significant effect on deep learning, meaning that they discussed many issues with their roommate $F(1,270) 5.78, p <.01$. The result confirmed hypothesis 2. Strategic learning style had two predictors—challenging classroom ecology and teacher-centric process. Challenging classroom ecology generated disequilibrium in students, leading to strategic learning, $F(1,270) 3.96, p < .05$. Teachers always set high expectation for students’ performance. At the same time, they gave priority to high performers and were found selective while setting a challenge to the entire class, $F(1,270), 4.11, p <.01. It substantiated hypothesis 1. Surface learning was a result of teacher-centric process and relationship with roommate. An overall $F(7,270) 3.28, p <.01$ was significant. Surface learners experienced academic stress during teacher-centric learning. Even relationship with the roommate was not very congenial (beta -.22) which deprived them of getting academic support from their room partner $F(1,260) 3.98, p <.01$.

**Discussion**

The study identified learning styles and its predictors of a prestigious professional institute. Students enrolled in various programmes were by and large, strategic learners. They had expectation of getting lucrative jobs after good performance. An overall difference on learning styles among social category was insignificant. The study noted significant difference between general category and the disadvantaged group students on deep learning, showing more practices of deep learning by general category students. The presage–process–product model (3Ps) suggested that the quality of learning outcome is contingent on students’ learning styles. The choice of a desirable learning style either deep or strategic is dependent on an awareness of both students’ learning situations and the contextual demand of learning and teaching style (Duff, 2004). Ramsden (1992) emphasizes that good teaching is always open to revolve and involves a constant process of assessing the effects of instruction on learning and modifying instructional methods. Academic performance is positively correlated with the strategic style and negatively with surface style (Entwistle and Ramsden, 1983). High scores on deep approach are positively
associated with academic performance, when the assessment procedure directly favours the
demonstration of conceptual understanding (Entwistle, Tait and Mc Cune, 2000). Therefore,
deep learning style and strategic learning style are conceptually related to effective learning
performance while surface style negatively related to strategic style. “The combination of
evidence that, on the one hand, a deep approach to learning is desirable and a surface approach is
less desirable and on the other hand the learning context (and in some cases students’
perceptions) can be changed by university teachers and administrators to afford one or other
approach, forms the basis of a powerful tool to improve the quality of students’ learning”
(Prosser and Trigwell, 1999, p. 98). The study observed more teacher-centric instructional
practices in the college. Other than engagement of remedial or tutorial classes for poor
performers, teachers hardly paid attention to them. There existed discovering classroom ecology
promoting healthy competition among students. This accounted for strategic learning as well
deep learning. But not all students had a desire for deep learning. In case of discovering
classroom ecology they had to face many difficulties and hence, opted for surface learning. It
was also true that all students had no equal learning capacities. Such students under teacher-
centric approach to learning adopted shortcut way of success. Whether learning style is a state-
of-art or trait? This issue has generated a debate on learning behavior. Cassidy (2004) argues that
learning style is a stable characteristic of learners that exists in a form over time. It is a state-of-
art changing with learning experience or learning situation. Curry (1991) suggests an “Onion
model” to explain learning behavior. A learner has three layers of learning preferences-
instructional, social and informational. Instructional layer deals with preferences of learning
environment while social interaction allows a learner to learn from social interaction.
Informational processing is an academic exercise a learner adopts. Witkin and Goodenough
(1981) explain learning styles in terms of field independence and field dependence approach to
learning behavior. Field independent learners are characterised as operating with an internal
frame of references, intrinsically motivated with self-directed goals, structuring their own
learning and defining their own study strategies. Field dependent learners, on the other hand, are
characterised as relying more on external frame of reference, are extrinsically motivated and
have a need for structuring and guidance from the instructor. Asian learners are more field-
dependent (Hofstede, 2002). The socially disadvantaged group of students got admitted to the
prestigious colleges because of low cut-off point under reservation policy. But the learning
environment was equally challenging to all. As a result, they could not cope with the learning
environment. Nor they were comfortable to the classroom teaching. They stayed away from the
classroom for many reasons. The choice of strategic learning was common to all. They had a
plan how to perform well in the exam. Least choice of deep learning by the disadvantaged group
students could be attributed to functioning and capabilities approach to exclusion in educational
programme (Nussbaum, 2011; Sen, 1999). Functioning refers to outcomes that a person values or
has reason to value. Capabilities are the freedom a person has to enjoy valuable functioning. A
functioning is an achievement (outcome), whereas a capability is the ability to achieve (Sen,
1985; Walker and Unterhalter, 2007). Functioning without capabilities restricts entitlement (freedom of choice) of the students. It provide some cues to understand how well students really perform in the academic programme (Wilson-Strydom, 2011, p.411).

**Conclusion**

The study suggested redesigning of pedagogy of the elite professional colleges where the disadvantaged group students’ learning style did not match the teaching-learning processes. To debate on the level of competence between students at par with the teaching-learning processes would not be an end point of discussion. An inclusive pedagogy needs to be evolved to cope with the academic stress that results from unpreparedness of students. Access to higher education does not necessarily ensure equity and social justice as the higher education institutions have gracefully designed a new form of exclusion. It is true that the meritorious exercise all learning tools for upward mobility and compete with demands of learning.

**References**


