

A Study of Class- Room Learning Climate on Concept Formation at Different Levels of Academic Achievement

Abstract

The quality of an educational institution is generally judged in terms of the expectable behavioural outcomes of students studying in it. The institution aims at developing three types of behavioural outcomes among the students. These are cognitive, psychomotor, and affective, behavioural learning outcomes. The various types of cognitive behaviour theoretically establish bear significant relationship with concept formation. Concept formation, in fact, is the route which leads to the smooth efficient and affective functioning of such mental processes as perceiving, remembering, thinking, reasoning, problem solving and even insightful behaviour. Development of cognitive abilities is possible only when there is a correct building of concept formation resulting in the exertion and familiarity with technical linguistics and contentual aspects of academic subjects. While a learning style is a characteristic of the learner the classroom climate is the characteristic of the school. It is significant to know, that classroom learning climate influences the concept formation of the student studying in it.

Keywords: Concept formation, Classroom learning climate

Introduction

A concept is a general meaning or idea or a property that can be predicated of two or more individual items. When a symbol stands for a class of objects or events with common properties, it is referred to as a concept. In general, concept refers to groups, categories or collection of things, events or relations.

According to '**Garrett**' (1961) – "A concept may be a word or mathematical symbol which embraces the common property or basic similarities of a variety of objects or events."

'**Munn**' (1961) maintains that – "A concept is a process which represents the similarities in otherwise diverse objects, situations, or events".

A concept may never be directly observed but only inferred, on the basis of the way in which a person categorizes objects and events in the environment. The distinction between extensional and intentional properties of concept emphasizes the difference upon which the categorization is based.

Hayakawa (1941) has pointed out that concepts have both extensional (or denotative) and intentional (or connotative) meanings. **Burner** (1956) views a concept as having three elements : **1. Examples, 2. Attributes, 3. Attribute Values** Examples are instances of concepts. In concept attainment, the negative and positive examples are tested and searched for their features. Every examples both positive and negative, can be described in terms of its attributes. An attribute is defined as any discriminable feature on an event which is susceptible of some variation from event to event. The distinguishing attributes and their value-range are called criterial attributes. If any one criteria attribute is missing from an object is an example of a different concept.

Bruner et al. (1956) identified following three types of concepts:

1. **Conjunctive concepts** – These concepts are defined by the joint presence of appropriate value of several attributes.
2. **Disjunctive concepts** – These concepts require the presence of some attributes and absence of others. These involve a certain combination of criteria attributes or any constituent thereof.

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- Disjunctive concepts are often defined by 'either' or characteristics'.
- Relational concepts** – These concepts involve the notion of a common relation among the various elements or attributes or values defining the concept.

Concept Formation: Concept formation represents the process of creating the building blocks of thinking. In thinking we utilize various sets of symbols or concepts, which represent meaningful connections or relations, among two or more similar objects or events. Concepts reduce the amount of information that we have to deal with and this makes our thinking and long term retention of our past experience Vastle easier than it would be otherwise i.e. if we are attempting to deal with raw sensory data that reach us from the environment directly. Acquiring a new concept thus, involves learning the relevant attributes of the concept either by abstracting these attributes for oneself from a number of instances of the concept of from a verbal description of attributes.

Objectives of the Study :

The study proposes to achieve objectives as under:

- To ascertain the influence of classroom learning climate of a school on concept formation among students at high academic achievement level.
- To ascertain the influence of classroom learning climate of a school on concept formation among students at average academic achievement level.
- To ascertain the influence of classroom learning climate of a school on concept formation among students at low academic achievement level.

Hypotheses:

- Formation of concept in a student is by and large a function of the classroom learning climate of his school.
- The better is the classroom learning climate of school, the more adequate is a student concept formation and vice-versa.
- Classroom learning climate of school being same, the adequacy of concept formation in a student depends upon his academic achievement status. The higher is the academic achievement status of a student, the more adequate is his concept formation and vice-versa.

Delimitations of the Study

In the context of resource human, physical and availability of time, the study has been confined to :

- Ascertainment of interrelationships among two variables, namely, classroom learning climate and concept formation.
- Finding out the influence of classroom learning climate on concept formation.
- Finding out the intervening effects of learner's characteristic, namely, academic achievement on the relationship between learning climate on the one hand and concept formation on the other.
- Students studying in urban secondary school or Meerut City.

Method and Procedure

1. Research Methodology: To achieve the objectives of the study, the causal comparative method has been used.

2. Tools chosen : The variables of the study were measured with the help of the tools mentioned below:

Variable of the Study	Tool used for its Measurement
Learning climate	Sharma learning climate scale
Concept formation	Dwivedi concept formation scale
Academic Achievement	Normalized total school achievement scores of IX graders studying in secondary schools

3. Sample and Sampling Technique : The study was conducted on a sample of 450 female IX graders selected through stratified random sampling Technique from nine schools of Meerut city.

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'F' [Analysis of variance] and 't' ['t' test of significance] test tables included under this head contains statistical values which are directly related to the First objective of the present study namely, to ascertain the influence of class-room learning climate on concept formation among students at different levels [high, average and low] of their academic achievement. It is clear that this objective has the following three variables.

I. Independent variable : Influence of class-room learning climate.

II. Dependent variable : Concept formation on IX grade students.

III. Intervening variable : Academic Achievement level (high average, and low) of the IX grade students. These three types of variables were first subjected to two way analysis of variances and then t test of significance provided the f value was found to be significant.

The succeeding pages contain 01 'F' test table and 9 't' test tables.

Table – A : 0

Showing significance of difference in the self concept of IXth graders differentiated on the basis of their Academic achievement [high average and lower] and Learning climate [good, normal and poor].

(A) Basic Data :

Correction factor (C.F.)	431458.6
Total Sum of Squares (S.S.T.)	9351.438
Sum of Squares between groups (S.S.B.)	1678.625
Sum of Squares within groups (S.S.W.)	7672.813
Sum of Squares of IX th grade achievers at three levels of class-room learning climate	895.062
Sum of Squares of IX th graders at three achievement levels (B.S.S.)	862.406
Interaction between learning climate groups and three levels of academic achievement	78.843

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(B) Computational operations for ascertaining significance of difference in the concept of IXth graders differing in their Academic Achievement (high average and low) and their learning climate.

Source	S.S.	D.F.	M.S.	'F' Value
Between Groups Learning Climate	895.062	2	223.765	12.861**
Between Achievement Level groups	862.406	2	431.203	24.784**
Interaction Between class-room learning climate groups and academic Achievement Levels	78.843	4	19.710	1.133
Within groups	7672.813	441	17.398	

A : 1

Showing significance of difference in the institutions characterized by the (1) good and (2) normal learning climate at high academic achievement level of the IX graders in respect of their self concept:

Difference between the self concept of high achieving IX graders studying in Institutions having	No. of Students	Mean	S.D.	't' Value
Good Learning Climate	N1 20	\bar{X}_1 36.87	σ_1 2.652	1.396
Normal Learning Climate	N2 60	\bar{X}_2 38.02	σ_2 4.432	

A : 2

Showing significance of difference in the institutions characterized by the (1) good and (3) poor learning climate at high academic achievement level of the IX graders in respect of their self concept :

Difference between the self concept of high achieving IX graders studying in Institutions having	No. of Students	Mean	S.D.	't' Value
Good Learning Climate	N1 20	\bar{X}_1 36.87	σ_1 2.652	1.943
Poor Learning Climate	N3 10	\bar{X}_3 34.00	σ_3 4.282	

A : 3

Showing significance of difference in the institutions characterized by the (2) normal and (3) poor learning climate at high academic achievement level of the IX graders in respect of their self concept:

Difference between the self concept of high achieving IX graders studying in Institutions having	No. of Students	Mean	S.D.	't' Value
Normal Learning Climate	N1 60	\bar{X}_2 38.02	σ_2 4.432	1.862

Poor Learning Climate	N3 10	\bar{X}_3 34.00	σ_2 4.282	
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B : 1

Showing significance of difference in the institutions characterized by the (1) good and (2) normal learning climate at average academic achievement level of the IX graders in respect of their self concept:

Difference between the self concept of high achieving IX graders studying in Institutions having	No. of Students	Mean	S.D.	't' Value
Good Learning Climate	N1 43	\bar{X}_1 31.16	σ_1 3.692	2.036**
Normal Learning Climate	N2 184	\bar{X}_2 32.51	σ_2 4.772	

B : 2

Showing significance of difference in the institutions characterized by the (1) good and (3) poor learning climate at average academic achievement level of the IX graders in respect of their self concept :

Difference between the self concept of high achieving IX graders studying in Institutions having	No. of Students	Mean	S.D.	't' Value
Good Learning Climate	N1 43	\bar{X}_1 31.16	σ_1 3.692	5.259**
Poor Learning Climate	N2 57	\bar{X}_2 26.91	σ_2 4.382	

B : 3

Showing significance of difference in the institutions characterized by the (2) normal and (3) poor learning climate at average academic achievement level of the IX graders in respect of their self concept :

Difference between the self concept of high achieving IX graders studying in Institutions having	No. of Students	Mean	S.D.	't' Value
Normal Learning Climate	N2 184	\bar{X}_2 32.51	σ_1 4.772	8.3271**
Poor Learning Climate	N3 57	\bar{X}_3 26.91	σ_2 4.382	

C : 1

Showing significance of difference in the institutions characterized by the (1) good and (2) normal learning climate at low academic achievement level of the IX graders in respect of their self concept:

Difference between the self concept of high achieving IX graders studying in Institutions having	No. of Students	Mean	S.D.	't' Value
Good Learning Climate	N1 10	\bar{X}_1 30.97	σ_1 3.612	.280
Normal Learning Climate	N2 44	\bar{X}_2 30.61	σ_2 3.882	

C : 2

Showing significance of difference in the institutions characterized by the (1) good and (3) poor learning climate at low academic achievement level of the IX graders in respect of their self concept :

Difference between the self concept of high achieving IX graders studying in Institutions having	No. of Students	Mean	S.D.	't' Value
Good Learning Climate	N1 10	\bar{X}_1 30.97	σ_1 3.612	2.062**
Poor Learning Climate	N3 22	\bar{X}_3 27.78	σ_3 4.902	

C : 3

Showing significance of difference in the institutions characterized by the (2) normal and (3) poor learning climate at low academic achievement level of the IX graders in respect of their self concept :

Difference between the self concept of high achieving IX graders studying in Institutions having	No. of Students	Mean	S.D.	't' Value
Normal Learning Climate	N2 44	\bar{X}_2 30.61	σ_1 3.882	2.364**
Poor Learning Climate	N3 22	\bar{X}_3 27.78	σ_2 4.902	

Results and discussion

The results of the Present study are presented objective wise tables as A : 1 to A : 3 represent the influence of class-room learning climate of at school on concept formation at high academic achievement level of IX graders. Similarly B:1 to B:3 represents the influence of class-room learning climate of a school on concept formation at average academic achievement levels of IXth graders. Finally Table C : 1 to C : 3 represent the influence of class room learning climate of a school on concept formation at low academic achievement level of IXth graders.

A glance over table A: O representing 'f' values yielded at between groups learning climate [F=12.861] and between achievement level groups [F=

24.78**] and interaction between learning climate and academic achievement level [F=1.133] reveals the following observations:

1. IXth graders studying in an institutions differing in their effectiveness of class room learning climate (good, normal and poor) differs significantly in respect of their self concept.
2. IXth graders differing in their academic achievement [high average and low] differs significantly by the magnitude of effectiveness of the learning climate of the educational institution, they happen to study.
3. Effectiveness of class room learning climate and IXth graders academic achievement bears significant relationship.
4. Self concept of IVth graders is influenced by their academic achievement and by the institutions learning climate.

A close study of the mean values contained in table A : 1 to A : 3, B : 1 to B : 3 and C : 1 to C : 3 reveals the following observations:

1. Table A: 1 shows that high achieving IXth graders studying in an institution differing in their learning climate do not differ significantly in respect of their self concept when the institutions learning climate is good and normal 't' = 1.396.

The insignificance of 't' value implies that high achieving IXth graders studying in either good or normal learning climate do not differ in respect of their self concept.

2. Table A : 2 as well as table A : 3 aiming to compare the self concept of high achieving IXth graders studying in good and poor learning climate (t-1.943) as well as those who are studying in an institutions characterize by normal or poor learning climate do not show any significant difference in their self concept (t-1.862).

Insignificance of 't' values in table A:1, A:2 and A:3 indicates that high academic achievers have similar self concept. There is a possibility that it is the self concept personality attribute which contributes to academic achievement of IXth graders.

Table B: 1, B : 2 and B : 3 however yields findings which are different from the findings of observed in table A : 1 to A : 3. table B : 1 shows that average academic achieving students studying in an institutions which are characterize by good learning climate and normal learning climate differ significantly in their self concept (t – 2.036**).

Strangely average academic achievers studying in average learning climate marginally have better self concept [X₂ = 32.51] than those who are studying in an institutions characterize by good learning climate [X₁=31.16].

Table B :2 confirms substantially the finding drawn in table B:1. Average academic achievers of IXth grade studying in good learning climate and poor learning climate significantly differ in respect of their self concept [t = 5.259**].

This table yields the following additional findings.

1. Differences in learning climate lead to differences in the self concept of average academic achievers.
2. Better is the learning climate of an institutions [good $\bar{x}'_1=31.16$ and poor $\bar{x}' = 26.91$]. The higher is the self concept of the average academic achievers.

Table B : 3 confirms the findings observed in table B :2. The average academic achievers studying in an institutions characterize by normal and poor learning climate [$t = 8.271^{**}$] differ significantly in their self concept.

In addition the table reveals that average academic achievers studying in an institutions characterize by normal learning climate have better self concept [$X_2 = 32.51$] than those average academic achievers who are studying in an institutions characterize by poor learning climate. [$X_2=26.91$].

Table C : 1 to C : 3 attempts to compare the self concept of low academic achievers studying in an institutions characterize by good, normal and poor learning climate.

1. Table C : 1 shows that low academic achievers studying in an institutions characterize by good learning climate do not differ significantly in respect of their self concept.
2. Contiguity of learning climate at the higher level (good and normal) contributes to the contiguity of self concept of the low academic achievers.
1. table C : 2 shows that low academic achievers studying in contrasting learning climate [good and poor] differ significantly in respect of their self concept [$t=2.062^{**}$].
2. Low academic achievers studying in an institutions characterize by good learning climate have better [$X=30.97$] self concept than those low academic achievers who are studying poor learning climate [$X_3=27.78$]
1. Table C : 3 shows that low academic achievers studying in an institutions characterize by normal and poor learning climate differ significantly in respect of their self concept [$t = 2.364^{**}$].
2. Low academic achievers who are studying in an institutions characterize by normal learning climate have better self concept [$X_2=30.61$] than those low academic achievers who are studying in poor learning climate [$X_3=27-78$].

Conclusions

The objective's of the study was to ascertain the influence class-room learning climate of a secondary educational institution on the concept formation of students studying with in it. It will be remembered that the present study confined its scope of student's sample to only IXth grade students. The present Study, therefore, has sought to ascertain the influence of class room learning climate of IXth graders of a school on the magnitude of his concept formation in the context of intervening influence of a students the cognitive characteristics namely academic achievement. The data related to the IX graders to class-room learning climate of a school, their

academic achievement and their self concept after being subjected to analysis of variance (two way) and t-test of significance yielded the following conclusions in respect of the objective's of the present study:

1. The class-room learning climate adopted by a student influences the magnitude of his concept formation.
2. There are significant difference among students in respect of the magnitude of their concept formation studying in good, normal and poor class room learning climate of the secondary institution on which the present study has been conducted.
3. There are significance difference in the concept formation score of the IXth graders who differed in their academic achievement.
4. The above conclusion implies that academic achievement of a student is a significant factor in the growth of self concept of the students [IXth graders] in the present study.
5. Interaction between learning climate of a school and the academic achievement of its students does not influence the magnitude concept formation growth on the student.
6. High academic achievers, irrespective of difference in the quality of class room learning climate, are better in the magnitude of those IXth graders who are average and low achievers.
7. Average academic achievers however, differs significantly from high academic achievers studying in similar type of class-room learning climate in respect of their self concept formation.
8. Average academic achievers studying in normal class-room climate are marginally better in concept formation than those IXth graders who are studying in good learning climate.
9. Average academic achievers studying in good learning climate situations are substantially better in their concept formation than those average academic achievers who are studying in poor learning class room situations.
10. Average academic achievers studying in either good class-room learning situations or normal class room learning climate situations are much better in the magnitude their concept formation than those achievers who are studying in poor class-room learning climate situations.
11. Low academic achievers studying in either good class-room learning situations or normal class-room learning situations do not significantly differ in respect of the magnitude of their concept formation.
12. Low academic achievers studying in good class-room learning climate situations are substantially better in the magnitude of their concept formation than those low academic achievers who are studying in poor class-room learning climate situations.

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13. Low academic achievers studying in normal class room learning climate situations are substantially better in the magnitude of their concept formation than those low academic achievers who have been found to be studying in poor class-room learning situations.
14. With the exception of the IXth graders who are characterized by high academic achievement status, it has been found out that better is the academic achievement of the IXth grade students, the better the magnitude of their concept formation in different types of class-room learning situations of the secondary educational institutions.

Educational Implications

1. For enhancing the concept formations of a student studying in an educational institution, the institution needs to plan and implement such pedagogical methodology, educational technology and socio-cultural activities which may contribute to the growth of a good learning climate.
2. The teacher should adopt such an analytical approach which may helping to analysis his teaching content appropriate to the learner's past academic achievement status.
3. During teaching the teacher needs to design such teaching situations as are commensurate to his students as are commensurate to his students achievement status, intelligence level as well as creativity level.
4. The teacher should assign class-room and home assignment to his students in terms of their academic achievement, and creativity.
5. The teacher must design a teaching – learning interactive situations which may be helpful to the learner's of his class to know the learning blocks, the factors, contributing to the formation of these teaching blocks and the remedies through which these blocks may be overcome by them.

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