

## A Critical Study of Secondary School Students Learning Styles with Special Reference to their Achievement in Science

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**Abstract:** *The main purpose of the study is to find out the relationship between learning style of students and their scientific attitude and achievement in science. It has been found that the learning style of the students is related with their scientific attitude and achievement in science. The other findings of the study show that some learning styles are related to high socio-economic-status and high intelligence. The learning styles have positive effect on achievement in science. The differences in the learning style, scientific attitude and abilities of the students emphasized the need for a variety of approaches. No single method or approach has been proven to be effective for all students. On the basis of the findings of the study, suggestions can be given to various individuals who are directly or indirectly responsible for the all round development of the students.*

**Key Words:** *Students, Learning Styles, Science, Achievement, Scientific Attitude.*

### 1. INTRODUCTION:

With the advent of 21<sup>st</sup> century, tremendous changes have been witnessed in Indian Society. Growing field of IT and other Technological revolution have changed the picture of past Indian. India is facing different types of challenge, which are of great significance from the development point of view. In this context, education is the most potent instrument of imparting knowledge to people, providing them a sense of purpose and develops qualities and values in them, which are essential for building a strong, cohesive and enlightened nation. In the history of mankind, education has always been considered a potential means and strong base for the development of human society. Through the development of attitude, values, capabilities, knowledge and skill, education provide strength and vitality to people. It enables them to face the challenges of time resolutely and to contribute to the social development most effectively. In democratic society like Indian, education has to be the main stay of all national endeavors. With the help of a powerful instrument (education), society has to perform many responsibilities concerning with its citizen. For this, society establishes and develops many organizations on course of time to achieve a variety of goals and objective. They serve various social, economic, cultural, political, religious and other purposes. Obviously they differ in their structure, finding, scopes, sizes, control and management and also in efficiency and outcomes. Schools and college are unique institution designed to achieve specific goal for preparing good citizens

These days when knowledge is multiplying day by day, where new methodologies, strategies and technologies are being invented; where new approaches and systems are being explored; where new models are being initiated to redesign and reshape the prevailing academic environment in institutions to keep pace with the increasing knowledge in each sphere; where educational literature in being enriched by new innovations, the objective of making learning more promising and maximally effective to the learner can be achieved by making instructions individualized. Teaching is made adaptive to the learner's ability, personality, interest etc. Teaching has been viewed as a science i.e. as a systematic application of rules of science of human behavior in organizing instructions for learners. Every learner has a characteristic pattern of behavior in particular learning field. A person's unique pattern of behavior and scientific attitude represents a unified pattern of person's thinking which is called learning style. In present situation, it seems important to highlight the learning variations among students by taking into consideration their learning styles.

In India, Science and Technology have been in use since long. But in recent years, India as a nation is heading for rapid individualization based on the use of high technology. Such effort needs automation and the use of computers. These efforts have two major requirements. First, there is a need of highly trained experts, who can build indigenous system of science and technology; second, scientifically literate citizens, who can take decisions about the proper use of science and technology.

In this science and technology oriented society every citizen should be able to understand the role of science. The study of science is helpful to acquire knowledge and skills for learners' future life and occupation, which is essential for achieving concrete results in terms of economic and social progress. Science satisfies the curiosity of the learner

regarding nature and other scientific phenomenon. Therefore, the study of science will be helpful in satisfying curiosity and in developing mind. Thus it is helpful in developing scientific attitude.

This investigation is a humble attempt by the researcher to explore the relationship between learning style and scientific attitude of students in relation to their achievement science.

### **1.1. Concept of Learning Styles:**

Learning style may be referred specifically to a person's characteristic pattern of behavior in a particular learning field. The determination of functional level and specific deficits provides the essential information for deciding what a child should be taught and decides 'How' to teach him effectively. Various psychological and educationalists have defined the term 'Learning Style' in simple words as the way with which student learns best.

Sigel and Coop (1947) viewed learning style as an integral concept that bridge the personality cognitive dimensions of individuals.

Gibson (1974) defined learning style as "The different ways in which people process information in the course of learning." He further defined that learning styles and cognitive styles are synonyms.

Education is not mere imparting of information in some selected subjects. Acquisition of knowledge is also one of the outcomes of educations. The role of education now is to help the educant to discover himself, to develop his innate abilities and above all to cultivate desirable attitudes and values.

Thus the most crucial problem of education now is how to cater to the individual differences so that teaching may be made more meaningful and adaptive for all students. Researchers, educationist and psychologists have developed various methods and techniques of teaching and learning. Identifying student's learning style is a one such technique. It is very important for the teacher to know as to what are the learning styles of students? Do they vary significantly? What type of learning procedures and activities promote the most rapid and successful learning by students who have deeply ingrained patterns for their own learning.

Researches and educationist are now attempting a thorough work in the area of the learning styles and have found it a very potential one in influencing the student learning, emphasizing the need to diagnose the learning styles of the students. Dunn and Dunn (1978) say, "To bring them (students) in to a confining environment and to group them in a way that makes educational sense, is virtually impossible unless we examine each of these complex individuals to identify exactly how, he or she is likely to learn more effectively." Achievement scores only reveal where the child is academically. I.Q. tests merely suggest a child's potential, not why he or she has not progressed further or more quickly. Personality instruments serve to explain the youngster's behavior, but they provide little insight into how to help him or her to achieve. It is possible, however for teacher, to help each student learn more effectively by diagnosing the individual's learning style.

### **1.2. Importance of Science Teaching:**

The aim of science teaching is not the acquisition of information and a few skills but to attain the understanding the relationship that connects the answer to the problems. The study of science is of great interest to children and provides a natural opportunity for children to grow in ability to solve problems. This growth in ability to solve problems then is one of the primary contributions science can make.

Through the study of science, pupils build concepts and ideas of their world, which they use in interpreting it. To guide the student towards an awareness of the problem and to create proper learning environment is the most important role of the science teachers. This will lead to inquiry approach and will develop an attitude of inquiry or problem solving among the students. Problem solving in science involves the use of scientific habits and attitudes which include; careful observations, skillful recording and effective communication. It includes the habit of withholding judgment, questioning sources of information, consulting many sources and other familiar aspects of what is commonly called scientific attitude. Various commissions, committees, institutes have made efforts to make science education a tool of making desired change in behavior, value, attitude and traditions in society. Kothari Commission (1964) has also emphasized the importance of science education and technology for progress of the country.

The National Policy of Education 1986 has clearly mentioned that "education is essential for all round development of the individual; it has responsibility to refine sensitivity, contribute to national cohesion and the development of scientific temper and independence of mind and spirit.

## **2. SCIENTIFIC ATTITUDE:**

Scientific Attitude represents a unified pattern of a person's thinking including curiosity, objectively, rationality and open mindedness. The scientific attitude may be defined as Open mindedness, a desire for accurate knowledge and the expectation that the solution of the problem will come through the use of verified knowledge. The scientific attitudes recognize three cardinal principles:

- Firstly, truth is what it is searching for.
- Secondly, no way should be missed that might help to find truth.
- Thirdly, what may seem to be the truth at one time, may later, under the advancement of new facts may prove to be something less than the truth.

Scientific Attitude comprises two aspects, science and attitude. These are discussed below:

**Science-** Science is one of those human activities that man has created to gratify human needs and desires. Science is valued mostly for gratifying curiosity and as an object of aesthetic charm. Science is considered as an assemblage of knowledge of systematic and organized facts “Science is a process of inquiry” resulting in building a body of systematized knowledge. Science is a form of inquiry and develops ability to think. Science thereby becomes knowledge acquired in a particular way. It becomes a human activity, an attitude and an exercise of the mind. The progress of science is marked not only by an accumulation of facts but also by the emergence of scientific method and of the scientific attitude.

**Attitude:** - Attitude is a condition of readiness for a certain type of activity. According to Freeman “An attitude is a dispositional readiness to response to certain situation, persons or objects in a consistent manner, which has been learned and has become one’s typical mode of response.” According to Thurston “An attitude is the degree of positive or negative effect associated with some psychological object. (Kapil-1994)

An attitude is the mental condition while a method is an organized series of acts. The scientific attitude is indeed closely related to the scientific method. A scientific attitude is an attitude, which will tend to foster scientific achievement.

According to NSSE, “Scientific attitude can be defined as open mindedness, a desire for accurate knowledge confidence in procedure for seeking knowledge and the expectation that the solution of the problems will come through the use of verified knowledge.”

Honey (1964) gave the following characteristics, which can be included in scientific attitude:-

1. Curiosity
2. Rationality
3. Willingness to suspend judgment
4. Open mindedness
5. Critically minded
6. Objectivity
7. Intellectual honesty.

Diederich (1967) also gave a long list of 20 components and defined each of them as a part of the scientific attitude as skepticism, faith in the possibility of solving problems desire for experimental verification, precision a linking for new things, willingness to change opinions, humility, loyalty to truth, an objective attitude aversion to superstition, liking for scientific explanation, desire for completeness of knowledge, suspended judgment, distinguish between hypothesis and solutions, awareness of assumptions, judgment of what is of fundamental and general significance, respect for theoretical structure, respect for quantification, acceptance of probabilities, acceptance of warranted generalization.

#### **Achievement: -**

Academic achievement has become an index of child’s future in this highly competitive world. It is only a drop in vast sea of education. The word “Achievement” is generally associated with the academic status of the students in different subjects or as a whole. Academic achievement is the core of educational growth. It has a great importance in child’s success and acts as a stimulant.

**Achievement Test:** - “When we use an achievement test, we are interested in determining what a person has learned to after he has been exposed to a specific kind of instructions.” (Thorndike-1913)

Achievement to Garrison and Others “The achievement test measures the present ability of the child or the extend of his knowledge in a specific content area.” Achievement in the present study takes into consideration the score or marks obtained by the students in U.P. Board High School Examination.

**Factors Associated with Learning and Achievement:** - People learn but they also forget. Learning may or may not be useful in new situation. Psychologists have been systematic in their concern with these matters and have had

something to say about each. A complete and perfect theory of learning would take each of the many factors associated with learning and deal with it in an explicit and precise way. All do not do so. The major factors, which are included in the present study, are discussed below so that their relevance to learning and achievement can be clearly discerned.

**3. Statement of the Problem:**

The problem of this study is “*A Critical Study of Secondary School Students Learning Styles with Special Reference to their Achievement in Science*”.

**4. Objectives of the Study: -**

The present study has been undertaken with the following objectives:

- To study the relationship between learning styles of students and their achievement in science.
- To study the relationship between scientific attitude of students and their achievement in science.
- To study the relationship between scientific attitude and achievement in science in relation to their learning style.

**5. Hypothesis of the Study: -**

The hypotheses for rest of the objectives are given below.

- There is no relationship between learning styles of students and their achievement in science.
- There exists no relationship between levels of scientific attitude of students and their achievement in science.
- There is no relationship between scientific attitude and achievement of students in science in relation to their learning style.

**6. Methods of the Study: -**

The researcher will be used the Ex-Post factor method in which an attempt is made to study the Study of Secondary School Students Learning Styles with Special Reference to their Achievement in Science. Generally this method is used in those studies in which subjects are sorted on the basis of some naturally occurring characteristics. This method is different from the experimental method in which the independent variable is directly manipulated by the researcher.

**7. Data Analysis and Interpretation:**

**Hypothesis-1** There is no relationship between learning styles of students and their achievement in science.

To prove this hypothesis, the sub-hypotheses have been formulated.

1. There is no significant difference in the achievement of the students following convergent and divergent learning style.

**Table-1**

Learning Styles	No. of Students	Mean of Achievement	Standard Deviation	Standard Error	t-Value
Convergent	150	69.00	12.08	1.46	5.53
Divergent	101	60.92	10.94		
				Significant at 0.01 level	In favour of convergent

The table shows that the achievement of the students following convergent learning style is significantly higher than those following divergent learning style. Null hypothesis number 1-a is thus rejected.

2. There is no significant difference in the achievement of the students following convergent and assimilative learning style.

**Table-2**

Learning Styles	No. of Students	Mean of Achievement	Standard Deviation	Standard Error	t-Value
Convergent	150	69.00	12.08	1.49	7.59
Assimilative	97	57.68	11.10		
				Significant at 0.01 level	In favour of convergent

The above table reveals that there is significant difference in achievement of the students following convergent and assimilative learning style. The present difference is significant at 0.01 level in favour of convergent learning style. Thus the above hypothesis is rejected.

- There is no significant difference in the achievement of the students following convergent and accommodative learning style.

**Table-3**

Learning Styles	No. of Students	Mean of Achievement	Standard Deviation	Standard Error	t-Value
Convergent	150	69.00	12.08	1.35	5.51
Accommodative	152	61.55	11.33		
				Significant at 0.01 level	In favour of convergent

The above table represents that there is significant difference in achievement of the students following convergent and accommodative learning style. This difference is significant at 0.01 level in favour of convergent learning style. Thus the above hypothesis is rejected.

- There is no significant difference in the achievement of the students following convergent and accommodative learning style.

**Table-4**

Learning Styles	No. of Students	Mean of Achievement	Standard Deviation	Standard Error	t-Value
Divergent	101	60.92	10.94	1.43	0.44
Accommodative	152	61.55	11.53		
					No Significant

The above table represents that there is significant difference in achievement of the students following divergent and accommodative learning style. Thus the above hypothesis is accepted.

- There is no significant difference in the achievement of the student following accommodative and assimilative learning style.

**Table-5**

Learning Styles	No. of Students	Mean of Achievement	Standard Deviation	Standard Error	t-Value
Accommodative	152	61.55	11.33	1.46	2.65
Assimilative	97	57.68	11.10		
				Significant at 0.01 level	In favour of accommodative

The above table represents that there is significant difference in achievement of the students following accommodative and assimilative learning styles. This difference is significant at 0.01 level in favour of accommodative learning style. Thus the above hypothesis is rejected.

- There is no significant difference in the achievement of the student following divergent and assimilative learning style.

**Table-6**

Learning Styles	No. of Students	Mean of Achievement	Standard Deviation	Standard Error	t-Value
Divergent	101	60.92	10.94	1.56	2.07
Assimilative	97	57.68	11.10		
				Significant at 0.01 level	

The above table represents that there is significant difference in achievement of the students following divergent and assimilative learning style but this difference is not significant at 0.01 level. Thus the above hypothesis is accepted.

**Hypothesis-2** There exists no relationship between levels of scientific attitude of students and their achievement in science.



**Table-7**

Level of S.A.	No. of Students	Mean of Achievement	Standard Deviation	Standard Error	t-Value
More S.A.	274	65.54	11.43	1.01	5.92
Less S.A.	226	59.55	11.13		
				Significant at 0.01 level	In favour of more S.A.

The above table reveals that there is significant difference between achievement of the students with more and less scientific attitude. The present difference is significant at 0.01 level in favour of students having more scientific attitude. Thus the above hypothesis is rejected.

**Hypothesis-3** There is no relationship between scientific attitude and achievement of students in science in relation to their learning style.

To prove this hypothesis, appropriate sub-hypotheses have been framed as follows:

- There is no significant difference between the achievement of student with more scientific attitude and less scientific attitude following convergent learning style.

**Table-8**

**Students following Convergent Learning Style**

Level of Scientific attitude	No. of Students	Mean of Achievement	Standard Deviation	Standard Error	t-Value
More scientific attitude	106	69.50	12.25	1.87	0.18
Less scientific attitude	44	69.15	9.63		
					No Significant

The above table shows that there is no significant difference in achievement of students having more and less scientific attitude. Thus the above hypothesis is accepted.

- There is no significant difference in the achievement of students with more scientific attitude and less scientific attitude following divergent learning style.

**Table-9**

**Student following Divergent Learning Style**

Level of S.A.	No. of Students	Mean of Achievement	Standard Deviation	Standard Error	t-Value
More S.A.	40	65.25	10.45	2.07	3.90
Less S.A.	61	57.16	9.83		
				Significant at 0.01 level	In favour of more S.A.

The above table reveals that there is significant difference in achievement of students with more and less scientific attitude following divergent learning style. The present difference is significant at 0.01 level in favour of students having more scientific attitude. Thus the above hypothesis is rejected.

- There is no significant difference between the achievement of students with more scientific attitude and less scientific attitude following assimilative learning style.

**Table-10**

**Students following Assimilative Learning Style**

Level of S.A.	No. of Students	Mean of Achievement	Standard Deviation	Standard Error	t-Value
More S.A.	40	65.13	9.60	2.14	1.95
Less S.A.	57	55.95	11.50		
					Not Significant

The above table represents that there is no significant difference in achievement of students having more and less scientific attitude. Thus the above hypothesis is accepted.

11. There is no significant difference between the achievement of students with more scientific attitude and less scientific attitude following accommodative learning style.

**Table-11**

**Students following Accommodative Learning Style**

Level of Scientific attitude	No. of Students	Mean of Achievement	Standard Deviation	Standard Error	t-Value
More scientific attitude	88	64.44	10.67	1.78	3.78
Less scientific attitude	64	57.70	11.07		
				Significant at 0.01 level	In favour of more S.A

The above table shows that there is significant difference in achievement of students with more and less scientific attitude and less. The present difference is significant at 0.01 level in favour of students having more scientific attitude. Thus the above hypothesis is rejected.

**8. CONCLUSION:**

The first objective of the study is to find out the learning styles of secondary school students. It has been found that the most popular learning style among students is accommodative learning style, which is being followed by 152 students. The adaptive emphasis of this learning style is on opportunity seeking, risk taking and action. So the students with an accommodative orientation tend to solve problems in an intuitive trial and error manner. They rely on other pupil for information rather than on their own analytic ability. Accommodative students use the self-discovery method. They receive information concretely and process it at activity. The accommodative learning style is most common among students because learners cannot understand an abstract verbal proposition without first relating it to concrete empirical experience and translating it into sub verbal terms. All real knowledge is self-discovered. Students themselves are best equipped to regulate the process of learning about themselves and their universe.

The second popular learning style among student is convergent learning style, followed by 150 students. In the present time students have become more practical and pragmatic. The changing circumstances affect the students' learning style. Convergent learning style is the combination of abstract conceptualization and active experimentation. Abstract conceptualization concern with the systematic scientific approach to problems and active experimentation emphasizes practical application and pragmatic concern. So it may be concluded that because of their pragmatic concern most of the students follow this learning style. It shows the convergent students are more practical and pragmatic. It has been found that very few numbers of students follow assimilative learning style. Assimilative learning style is the combination of abstract conceptualization and reflective observation. Reflective observation emphasizes on understanding and feeling. The students with assimilative learning style like to rely on their own thoughts and feelings to form opinions. But as most of the students rely on other pupil for information and they believe in practical values. Therefore, they are following convergent and accommodative learning style. This may be the reason why only few students have been found to follow assimilative learning style and why most of the students follow convergent and accommodative learning style. The Divergent learning style is another learning style, which is also being followed by very few students. The greatest strength of this orientation lies in imaginative ability and awareness of meaning and values. The emphasis on this orientation is an adaptation by observation rather than by action.

Result of the present study shows that learning style reflects the students' thinking, their personality characteristics, problem solving ability and approaches to deal with life. It can be concluded that the students, who learn with abstract concepts and have ability to correlate concepts with practical situations, have more probability to prefer convergent learning style. The students, who depend on external factors and situations, prefer accommodative learning style.

The findings of the objective of the study reveal that the students, who follow the convergent learning style, possess more scientific attitude. It indicates convergent learning style helps in developing scientific attitude. The students with accommodative learning style also possess more scientific attitude. Convergent learning style focuses on using logic, ideas and concepts. It emphasize on thinking and systematic approach. Students who follow accommodative learning style have an open-minded approach to life. Open mindedness, logical thinking and systematism are basically the components of scientific attitude and thus convergent and accommodative learner possess more scientific attitude. Assimilative and divergent learning styles are following by the students who possess less scientific attitude. These learning styles focus on feelings and thoughts. On the basis of present findings it can be concluded that students who follow convergent and accommodative learning style possess more scientific attitude.

The perusal of table 1, 2 and 3 reveal that the achievement of the students following convergent learning style is significantly higher than the achievement of students following other learning style. It means the convergent learning style is most appropriate style for science. The reasons that can be attributed to the fact, that the convergent learning

style focuses on practical application of ideas and willing to take some risk achieving their objectives. These characteristics of learning style help the students in learning science.

The result of the present study shows that the students' achievement in science is related to their learning style. The present study supports the findings of some investigations conducted by Crutchfield (1958), Fitzgibbons (1968), Noorjahan (1993) and Afif (1998). But another group of investigators viz. Henderson (1980), Venugopal (1994) indicates that there was no relationship between the cognitive styles of students and their achievement in science.

The findings of the objective of the study reveal that students with more scientific attitude score better in science than those who possess less scientific attitude. Generally, it is expected that more scientific attitude of the students will help in learning science. The characteristics of scientific attitude i.e. open-mindedness, desire for accurate knowledge, curiosity etc. work as a prompter in classroom learning. Scientific attitude is applicable to every learning situation, hence, the students with more scientific attitude are going to achieve better not only in science but also in all subjects. Thus the scientific attitude has emerged as one of the important factor in learning.

The achievement of the students with more scientific attitude is significantly higher than the students having low scientific attitude in relation to divergent and accommodative learning style. Therefore, it can be concluded that scientific attitude play a significant role in achievement of students who follow these learning styles.

The result reveals that the students with more scientific attitude and less scientific attitude following assimilative learning style do not shows significant difference in the achievement in science. It is evident from the tables that mean of the achievement of the students who are following assimilative learning style is significantly less than the students who are following other learning styles. It seems that the students who follow assimilative learning style are achieving less in spite of more scientific attitude. It shows that their learning style is not appropriate. On the basis of the findings it can be concluded that learning styles have emerged as the most important factor in learning.

The result shows that a maximum number of students having more scientific attitude are following convergent and accommodative learning style or we can say that students who follow these learning styles are having more scientific attitude. There exists a cause and effect relationship between learning style and scientific attitude. But it cannot be concluded that whether the scientific attitude is the product of learning style or they are following appropriate learning style because of their more scientific attitude.

Result also shows that most of the students who are following accommodative learning style are of low intelligence. The table shows that the achievement of the students following accommodative learning style is better than students following assimilative learning style. Further, it has been found that scientific attitude play a significant role in achievement of students who follow accommodative learning style. It can be concluded that students who have low intelligence, if they possess more scientific attitude, they can achieve better.

## REFERENCES:

1. Anastasi, A. (1988). *Psychological Testing* (6<sup>th</sup> ed.). New York; McMillan Publishing Company.
2. Ausubel, D.P. Novak, J.D. and Hanesion H. (1978), *Educational Psychology – A Cognitive View*. (2<sup>nd</sup> ed.), New York, Halt Rinehar and Winston, Inc.
3. Best, J.W. and Kahn J.V. (2001), *Research in Education*, (7<sup>th</sup> ed.), New Delhi; Prentice Hall of India.
4. Bruner, J. (1960), *Learning and Thinking*, Harward Education Review, in Ausubel, D.P. Novak, J.D. and Hanesion H. (1978), *Educational Psychology – A Cognitive View*. (2<sup>nd</sup> ed.), New York; Halt Rinehar and Wintson, Inc.
5. Cecco, D.J.P. and Crawford, W. (1988), *The Psychology of Learning and Instruction* (2<sup>nd</sup> ed.), New Delhi, Prentice Hall of India Pvt. Ltd.
6. Diedrich, P.B (1967), *Components of Scientific Attitude* in Rao, D.B. (1997), *Reflection on Scientific Attitude*, New Delhi; Discovery Publishing House.
7. Edward, D.B. (1976), *Lateral Thinking*, New York; Harber and Raw.
8. Garger, S. and Guild, P. 91984), *Learning Style; The Crucial Differences*, Reprinted from *Curriculum Review*, Cicago, Illinois.
9. Garrett H.D. (1980), *General Psychology*, (2<sup>nd</sup> ed.), Eurasia Publishing House Pvt. Ltd.
10. Garrett H.E. (1981), *Statistic in Psychology and Education*, Bobmay; Vakils, Feffer and Simon's Ltd.
11. Garrison and Others as quoted in Saraswat M. (1987), *Shiksha Manovigyan ki Ruprekha*, Alok Prakashan.
12. Gary, D.B. (1996), *Effective Teaching Method*, (3<sup>rd</sup> ed.). NJ; Prentice Hall.
13. Hillgard, E.R. and Bower, G.H. (1977), *Theories of Learning*, (4<sup>th</sup> ed), New Delhi, Prentice Hall of India.
14. Honey, R.E. (1964), *The Development of Scientific Attitude*, in Rao, D.B. (1997), *Reflection on Scientific Attitude*, New Delhi; Discovery Publishing House.
15. Kandu, C.L. and Tutoo, D.N. (1988), *Educational Psychology*, (5<sup>th</sup> rev. ed.), Starling Publishers Pvt. Ltd.