Impact of Teacher Competence and Teaching Effectiveness on Students' Achievement in Life Science Subject at the Upper Primary Stage

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Abstract

The quality of education goes with quality of teachers. Teacher education is a system that prepares teachers who could teach the children in schools effectively. It is grounded in the belief that teachers, not assessments, must be the cornerstone of any systematic reform directed at improving our schools. The teacher is the mediator between the knower and the known, between the learner and the subject to be learned. In the present paper, efforts are made to study the qualities of teachers required for enhancement of students' achievement in Life Science subject. The paper also suggests the skills to be developed to become an effective and competent teacher and thus provide quality education to all children. Twenty-one schools of Birbhum and Burdwan districts of West Bengal state were selected through stratified random sampling technique for the study. Four boards under West Bengal were selected for the study; they were W.B.B.S.E., V.B, I.C.S.E. and C.B.S.E. 564 students were selected as the sample for the present study. Thirty-five teachers of Life Science from the twenty-one schools were the sample of teachers for the present study. The data were collected through Teacher Competence Scale, an Observation Schedule and an Achievement Test. The findings of the study indicate that students do differ significantly in achievement in Life Science

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subject due to teaching by high or low competent teachers and also due to high or low teaching effectiveness of teachers, further substantially positive relationship between the teacher competence and teaching effectiveness were found. Thus, for enhancing the students' achievement in Life Science, there should be properly trained competent teachers who are acquainted with the latest methods of teaching, use of technological aids and have a through rapport with latest syllabi at the secondary level.

Introduction

Quality school education may be defined as education that enables children learn what they could learn or should be able to learn in school. It helps them to know themselves for their hidden talents. They should know themselves and also know how to work upon them in their own interest and in the interest of the society. There are many factors that account for what the students learn in schools. The home has a role in it. The society plays its role. In a school there are many things that matter. Above all, there are teachers in schools who are held accountable for it. No system of education could be better in quality than the quality of its teachers who educate the children. The quality of education goes with quality of teachers. They need competent teachers. Their commitment for quality school education is needed. In the words of Education Commission (1964-66): 'of all the factors which influence the quality of education and its contribution to national development, the quality, competence and character of teachers are undoubtedly the most significant. Nothing is more important than securing a sufficient supply of high quality recruits to teaching profession, providing them with the best possible professional preparation and creating satisfactory conditions of work in which they can be fully effective.'

Thus, for quality school education the following is required:

1. Securing the sufficient supply of high quality recruits to the teaching profession.
2. Providing them with the best possible professional preparation.
3. Creation of satisfactory conditions in which the teachers can be fully effective.

The conditions in which teachers could give quality school education need to be analysed. All persons can't teach. All are not born teachers. We only betray our ignorance about what teaching is. This kind of our thinking is based upon some logic that every one of us is not fit for becoming what we want. The same logic holds good for the teaching job in schools. It can be open for all to contest for but entry to it cannot be given to everyone. Obviously, all are not to be taken to be fit for it. Teaching is not every body's cup of tea. In this complex and complicated

information society, there are persons who could become efficient teachers and there are, of course, people for whom teaching is not meant for. It is all the more true that none can teach without knowing how to teach. Teaching is an art as well as science. It is the quality teacher education that is needed for quality school education. In the words of Education Commission (1964-66): 'The essence of programmers of teacher education is 'quality' and in its absence, teacher education becomes not only a financial waste but a source of overall deterioration in educational standards.' It is grounded in the belief that 'teachers, not assessments, must be the cornerstone of any systematic reform directed at improving our schools ……. The teacher is the mediator between the knower and the known, between the learner and the subject to be learned. A teacher, not some (test), is the living link in the epistemological chain.' (Madaus, cited in Darling-Hammond, 1997, pg. 293). National studies and reports have documented the strong relationship between teacher quality and student performance.

Teaching when properly performed is a professional activity. It does require the use of specialised knowledge and skill on behalf of other people. In defining the teacher's role, it should be stated that the function of the teacher is to help his pupils to acquire skills in different subject-areas. The teacher's task at this stage is two-fold: to offer skills in his subject discipline and also to use various ways and means to aid his pupils to learn how to employ their own talents to acquire the skills that the teacher wishes them to acquire. Education for the 21st century needs to enhance an individual's ability to assimilate, evaluate and apply the available information. The globalisation is affecting the economy, culture and information, internationalisation of relations, mobility of individual communications, and media. This is a challenge to the system of education as well as the teachers. Thus, globalisation in the 21st century calls upon the teachers to change their roles to meet the future demands of the society.

Educators and researchers have debated which school variables influence student achievement for many years. As policymakers become more involved in school reform, this question takes on new importance since their many initiatives rely on presumed relationships between various education-related factors and learning outcomes. Despite conventional wisdom that school inputs make little difference in student learning, a growing body of research in India and abroad suggests that schools can make a difference, and a substantial portion of that difference is attributable to teachers. Despite the educational growth, competent teachers are still a need, though teachers are being appointed every year. Competent teachers create an effective learning

environment which is very much in need for the students' outcome/ achievement. Just as a quality course is important, quality instruction is important too. Most of the instructors currently teaching do not apply the skills needed to be effective in classroom. Thus, quality faculty is needed to give the quality training to the teachers. The production of quality and competent teachers are required to give quality education to students resulting in maximum students' benefit. Thus, the first step is to define what a quality instructor is or what are the competencies required or at least recommended for a quality and competent teacher to teach effectively. Teacher education and job performance of a teacher are the contexts in which this term is used. Competencies are the requirements of a competency-based teacher education, which includes knowledge, skills and values that trainee teacher must demonstrate for successful completion of the teacher education programme (Houstan, 1987). To be competent is not the awareness, the attainment or even the knowledge of various attributes although all of this play a part. To be competent is the juxtaposition of this knowledge with the application of that knowledge in a teaching practical. In other words, a competent individual is one who effectively and efficiently accomplishes a task (instructs) in a given context using appropriate knowledge, skills, attitude and abilities with time and needs. These individuals are who are sought after for instruction. In some way, the knowledge, skills, attitude, abilities, etc that comprise a competent instructor need to be articulated in order to access one's competence in the given context. Thus, it can be said that to make classroom teaching more effective so that the learning outcome of students is better, good competent teachers are required. These teachers make the students learn on their own and thus help to develop their creative thinking. The students' achievement thus can judge how good the teaching is and thus the teacher.

In all, we can say that if the teachers are trained properly in developing their skills / competencies, she/he can deliver effective teaching which facilitates the learning outcome of students, make them think independently and develop their creativity. These achievements can be measured by different modes of evaluation to assess the students' learning outcome. In all, good teaching competencies make effective teaching in classroom which has impact on students' learning outcome. Thus, a teacher needs to scrutinise her/ his teaching performance regularly to be competent which is very much required. Teaching effectiveness is another variable that is likely to have great impact upon students' learning. Although there is a close relationship between teacher competence and teaching effectiveness, yet those are

different. Competence has do with how a teacher teaches as is measured in terms of the teacher's behaviour; on the other hand, how effective a teacher is, is measured in terms of pupils' learning. In other words, an effective teacher is always competent, but a competent teacher may not be effective, for a multitude of reasons. Darling-Hammond's (2000) findings indicate a consistent and significant positive relationship between the proportion of well-qualified teachers and students' achievement on the National Assessment of Educational Progress (NAEP) in Reading and Mathematics.

Without competent and effective teachers, education in any branch of science is likely to remain incomplete. Proper assimilation of knowledge, development of skills, inculcation of values and attitudes – nothing is perhaps possible without the help and guidance of competent teachers. All these are reflected in the learners' achievement scores (these are the products or outcomes of students' learning). For knowing the outcome of students' learning, evaluation must be done with as much care as possible. Without solid evaluation we really don't know how much the students have learned. Some people may argue that teacher competence and teaching effectiveness are not such important factors in students' learning; if students are serious and sincere, or if other congenial factors like parental guidance are there, then they may fare well in their examinations even if their subject teachers lack in competency and effectiveness. Thus, researcher intended to establish beyond doubt the importance of teacher competence and teaching effectiveness on the learners' achievement (though not undermining the importance of other congenial factors) and for that reason, undertook the present study. The researcher having a background of Life Science subject wanted to see if competent teachers could help in the achievement of the students, particularly in Life Science subject by effective teaching. Considering the importance of science education, she/he has chosen one of the two major branches of science education in school-curriculum. In order to verify objectively the already existing notion about the positive impact of teacher competence and teaching effectiveness on students' achievement in science subject at school level, the present researcher has undertaken this study.

Review of Related Literature

Many factors contribute to the quality of teaching, such as the professional competence of the teacher, which includes subject matter knowledge, pedagogical content knowledge, knowledge of teaching and learning, curricular knowledge, teaching experience, and certification status (Shulman, 1986, Grossman, 1995, Westera, 2001). Darling-Hammond's (2000) findings indicate a consistent

and significant positive relationship between the proportion of well-qualified teachers and students' achievement on the National Assessment of Educational Progress (NAEP) in Reading and Mathematics. Teacher effectiveness depends on how well a teacher performs in the classroom, and this is dependent on how competent the teacher is.

The literature (Chapman and Mählck, 1997, Kanu, 1996, Châu, 1996) emphasises the importance to the performance of the pupils of the quality of teacher who has well developed subject knowledge, pedagogical content knowledge and curriculum knowledge. In the Mozambican context, the nature of the learning outcomes depends on the level of teacher competence, and teacher competence depends in turn on the teacher training curriculum, the level of competence of the trainer, and that of the mentor at the school to whom the teacher is assigned. Various researchers studied the impact of teacher competency and teaching effectiveness on improvement of classroom teaching to enhance the students' achievement. Following are some examples— Choubey (1965-66), conducted a study on – "Improvement of Teachers' Professional Competency in the use of Classroom Technique". The purpose of the study was to find out a way to provide guidance to teachers, already working in the schools, to improve their teaching competency. The findings were the highest improvement was in the ability i.e. interest in practical and written work of the pupils. The capacity of the presentation of matter and ability of using AV aids properly were remarkably improved. It seems that guidance of colleagues and training in the use of AV aids has shown their effects on the teachers' work in the classroom. Parmar, Haider. and Joshi, (2008) conducted a study on "Attitude of Student Teachers towards Teaching Profession and Teaching Competency". This was a descriptive study conducted through quantitative analysis aiming at determining the attitudes of student teachers of Jharkhand towards teaching profession and determining their teaching competencies. The results obtained within the scope of the study are: Level of teaching competency of student teachers participated in the study is not satisfactory and vary in terms of their gender, educational level, residential background and subject studied in favour of female student teachers, postgraduates, student teachers belonging to urban residential area and student teachers with science background respectively. However, level of teaching competency of student teachers does not vary in terms of their employment status, marital status and cultural background. Attitudes of student teachers participated in the study towards teaching profession are positively correlated to the level of their teaching competency.

Banerjee and Sinha 2010 conducted a study on the "Impact of Micro Teaching in enhancing the skill of explaining in the B.Ed. students in Burdwan, West Bengal" and found that there was an effect of training of micro-teaching approach on the experimental group of pupil-teachers of method group. There was also development in the competency of the experimental group of pupil-teachers using micro-teaching approach in simulated conditions This survey was conducted on four B.Ed. colleges to probe into the effect of micro-teaching on the teaching competency of the pupil teachers of the course. Bansibihary, Pandit and Surwade, Lata (2006) conducted a study on "The Effect of Emotional Maturity on Teacher Effectiveness" and assumed that in the field of education, the quality of education or educational programmes, which is a function of effective teaching, depends upon the level of emotional maturity of teachers. It was, therefore, hypothesised that the teaching of emotionally mature/ stable teachers would be more effective than those of emotionally immature or unstable teachers. Findings were that female teachers are emotionally more mature/stable than male teachers who are found to be emotionally immature/unstable. The teaching of emotionally mature teachers is more effective than those of emotionally immature teachers, whose teaching is found to be of average grade and there is no sex difference in emotionally mature group with respect to teacher effectiveness. Ding, Cody, Sherman, Helene, 2006 conducted a study on "Teaching Effectiveness and Student Achievement: Examining the Relationship" and found the relationship between teacher effectiveness and students' achievement as measured by test scores. This relationship suggests that there is a direct causality among teacher preparation, teacher quality and student achievement. It stresses that policy makers and public and private funding agencies believe that these test scores correlate to the quality of teaching effectiveness. The results of these studies demonstrate that teachers should maintain high verbal caring to preserve their credibility in the classroom. It is in teachers' best interests to be perceived as both competent and trustworthy to be effective in the classroom. Teachers who are better able to monitor their behaviours in the classroom may be subsequently able to achieve greater learning outcomes in their students.

Objectives of the study

(i) To assess the science teachers' competencies through a standardised scale and to categorise them on the basis of their competencies.

(ii) To assess the teaching effectiveness of the science teachers through a standardised scale and to classify them in different categories.

(iii) To find out the effect of teachers' competencies on students' achievements.

(iv) To find out the effect of teaching effectiveness on the students' achievements.

(v) To find out the relationship between teacher competence and teaching effectiveness.

Assumptions

1. Teacher competencies can be measured through a standardised teacher competence scale.
2. Teaching effectiveness can be measured through different techniques, such as interaction analysis, classroom analysis, and standardised scale.
3. Students' achievement can be measured through teacher made test.

Hypotheses

H1. Students' achievements in science subjects shall vary significantly due to different teacher competencies.

H2. Students' achievements in science subjects shall vary significantly due to differences in teaching effectiveness.

H3. There is substantial positive relationship between teacher competence and teaching effectiveness

Research Design

Employing a 2x3 factorial design in this survey-type research, subjects were randomly assigned to one of the two categories of teachers under high and low teacher competence and teachers with high and low teaching effectiveness.

The researcher was interested in determining the achievement in Life Science subject measured under the different categories of teachers.

Thus, the variables in the study were –

1. Teacher competency – independent variables
2. Teaching effectiveness – do
3. Students' achievement (Life Science subject) – dependent variable.

Population and Sample

The students of Std. VIII of the schools selected for study constitute the population of this study. The schools were from the Birbhum and Burdwan districts of West Bengal State.

Twenty-one schools of West Bengal state were selected for the study.

The schools were selected through stratified random sampling technique. Four boards under West Bengal state were selected for the study; they were W.B.B.S.E. (West Bangal Board of Secondary Education), V.B, I.C.S.E. and C.B.S.E. Selection of schools was done according to their availability in the districts chosen.

Thirty-five teachers of Life Science from the twenty-one schools of four different boards i.e., W.B.B.S.E., V.B., I.C.S.E., C.B.S.E were the sample of teachers for the

present study. All the Life Science teachers were taken for the study, no sampling done in case of selection of teachers.

Total 564 students were selected as the sample for the present study. Sampling was done by administering a Pre-test in Life Science subject (with the help of Life Science teachers) for Class VII to test the previous knowledge gained in Life Science. The results of Pre-test were used to classify the students according to merit. A cut-off mark of 30 was fixed out of total marks 50. In this way the sampling was done.

Tools Used

For the purpose of the present study tools used were:-

(i) "Teacher Competence Scale" developed by Passi and Lalitha was used to measure the teaching competency in five major areas i.e.,
   (a) Planning (Pre-instructional),
   (b) Presentation (Instructional),
   (c) Closing, (d) Evaluation, and
   (e) Managerial.

The scale includes 21 items related to 21 teaching skills which encompass the entire teaching-learning process in the classroom. It is a 7-point rating scale measuring the use of skill by the teacher in the classroom corresponding to each item ranging from '1' for 'not at all' to '7' for 'very much'.

(ii)(a) A standardised "Teacher Effectiveness Scale" by U. Kulsum was used to measure the teaching effectiveness in five major areas by a 5-point scale and a self-assessment questionnaire. The five major areas seen here are:
   (a) Preparation and planning for teaching,
   (b) Classroom management, discipline, motivation, interaction, evaluation,
   (c) Knowledge of the subject matter, its delivery and presentation, including B.B. Summary,
   (d) Personality characteristics of teachers, and
   (e) Interpersonal relations of teachers with others.

These five areas cover all aspects of teachers function and hence have the merit of adequate conceptual framework and content validity. 60 items are included in the scale.

(b) A standardised Observation Schedule was used to measure the teaching effectiveness.

(iii) An achievement test for testing the previous knowledge of the students of Class VIII in Life Science (Pre-test in L.Sc.).

Procedure

The present study intended to find out the impact of teacher competency and teaching effectiveness on students' achievement in Life Science subject. Students of Class VIII were taken as subjects from different schools of Birbhum and Burdwan districts of West Bengal. The study was done also to measure

the students' achievement in Life Science under different categories of competent and effective teachers. This study involved 564 students of Class VIII of secondary schools of West Bengal. Subjects were selected by administering a pre-test on the total students taken of Class VIII of all schools. Random sampling was done for selecting the sample. Schools were selected through stratified random selection. Four boards of schools (i.e. Visva Bharti Board, CBSE, ICSE and West Bengal board) in the districts of Birbhum and Burdwan were chosen for the study.

Visva Bharti Board – has two schools only; C.B.S.E. – two schools (permission not given for other schools); I.C.S.E. – four schools (where permission was given by the authority); W.B. board – thirteen schools were chosen randomly (all urban schools).

The researcher visited all the selected schools and the particular Class (VIII) on a suitable date and time with prior permission of competent authorities and administered an achievement test (Pre-test) in Life Science subject of the previous Class (VIII). A cut off mark of 70 per cent was fixed for selecting the samples. In this way sampling was done to classify the students according to merit. Since it was not possible to include all the schools, only twenty-one schools were chosen by stratified random selection. Thirty-five Life Science teachers were selected for the study. Secondary schools of urban area were only taken for the study. Tools were applied first on teachers, i.e., teacher effectiveness scale by Kulsum and teacher competency scale of Passi and Lalitha during the time the teacher taught in the Class. A cut-off mark was fixed according to the advice of experts (5) Mean+-0.5 S.D. from mean was taken as cut-off mark to differentiate high and low categories of teacher competence and teaching effectiveness. Further observation schedule was also maintained by the investigator to observe the teaching of the Life Science teachers. Results of the achievements scores of the students were then recorded. These scores were arranged accordingly under high and low levels of teachers. Mean, S.D. and C.R. values were calculated and interpretations done to find out the significances of difference, if any, between the two categories of students.

Operational Definitions of the Terms

Teaching

Teaching is imparting to others the acquired knowledge which we want them to know. It is a process by which a learner is led to understand and acquire the knowledge which she/he is expected to have. Teaching is a process of transferring knowledge or experience to the learner or teaching is the development of inborn potentials of the pupils being taught, by the way of imparting some

knowledge to them as a foundation for further development.

Teacher Competence

Teaching process is determined by knowledge, a set of abilities, attitudes and skills (pre-sage variables) which in turn determine pupil outcomes. Thus, the term 'teaching' can be defined as a set of observable teacher behaviours that facilitate or bring about pupil learning. Thus, teacher competence is a pre-determined set of outcomes that is usually related to particular skills, knowledge and attitudes.

Teaching Effectiveness

Teaching is effective to the extent that the teacher acts in ways that are favourable to the development of the basic skills, understanding work habits, desirable attitudes, value judgments and personal adjustments of the pupil. On the basis of opinions expressed by the educators above and experts in the field of education, the operational definition of teaching effectiveness which emerges is: An effective teacher is she/he who has clear concept of the subject matter, ability to write clear objectives for her/his course, ability to organise learning materials, ability to communicate her/his knowledge to the students successfully and to deal with classroom situations.

Students' Achievement

Achievement is the amount of knowledge derived from learning. The child gains knowledge by the instruction she/he receives at the school.

According to the Dictionary of Education (Carter, 1959), academic achievement means the knowledge attained or skills developed in the school subjects, usually designed by test scores or by works assigned by teachers or both.

The achievement is accomplishment of proficiency of performance in a given skill or body of knowledge. The achievement in this study means the scores obtained by students on tests in Life Science developed by the investigator and collected through different evaluation strategies.

Data Analysis and Interpretation

Correlations, C.R. test, were used for analysing the collected data. C.R. test was done to find out the difference between mean achievement scores of students under different categories of teachers. Product moment correlation was used to find out the relationship between two independent variables 'Teacher Competence' and 'Teaching Effectiveness' of Life science teachers.

Verification of the first and second hypotheses was done with the help of C.R. test to find out if there was any significant difference in the mean achievement scores of students taught by two groups of teachers i.e., high and low competent teachers and also teachers with high and low teaching effectiveness.

The third hypothesis was verified with the help of product Moment Correlation, to find out the relationship between teacher competence and teaching effectiveness of individual teachers. Teacher competence scores were computed from the data collected through administration of GTCS scale of Passi and Lalitha. Teaching effectiveness scores were computed from the data collected through administration of KTES scale, which has two parts: (i) Researcher's rating, and (ii) Self-assessment and also the observation was made by the researcher with the help of an Observation Schedule (standardised).

Results

The results obtained are given below in the following tables, i.e., 1, 2 and 3. The results related with hypothesis 1 regarding students' achievements in Life Science subject which differ due to different levels of teacher competency are given below with figure. There is difference in achievement in Life Science subject of two groups of students (one, taught by highly-competent teachers and another, taught by less-competent teachers).

Table1

Significance of difference between M. Ach. Scores (Life Science) of two groups of students under high and low competent teachers.

M1	M2	D	SED	C.R.	S/NS
27.92	26.49	1.43	0.698	2.048	S

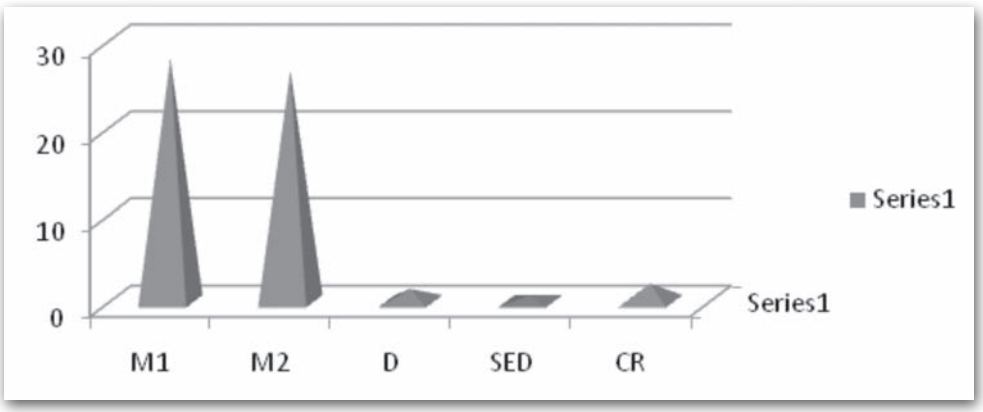
Where,

M1=Mean achievement score of Grp-1, i.e. group of students taught by highly competent teachers. N=267

M2= Mean achievement score of Grp-2, i.e. group of students taught by low competent teachers.

N=100. Accepted level of significance: - 0.05

Fig.1: Showing significance of difference between M. Ach. Scores (Life Science) of two groups of students under high and low competent teachers



It is evident from the table 1 and fig.1 that there is significant difference between Group1 and Group 2 in mean-achievement scores in Life Science subject. Therefore the hypothesis 1 is retained, i.e., students' achievements in science subjects shall vary significantly due to different teacher competencies. As greater score indicates better achievement in the subject, it is indicated that the students taught by highly competent teachers achieve better in Life Science subject than the students taught by low competent teachers. The diagram above indicates the differences between the two mean values obtained from the mean achievement scores in Life Science subject under the different categories of teachers.

The results related with hypothesis 2 regarding students' achievement in Life Science subject differs due to differences in teaching effectiveness is given below. There is difference in achievement in Life Science subject between two groups of students (one, taught by highly-effective teachers and another, taught by low-effective teachers).

Table 2

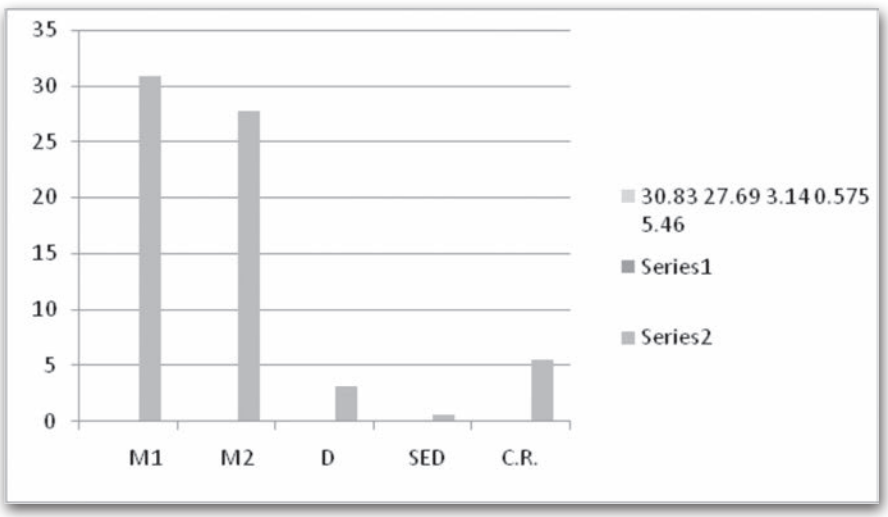
Significance of difference between M. Ach. Scores (Life Science) of two groups of students under high and low effective teachers

M1	*M2*	*D*	*SED*	*C.R.*	*S/NS*
30.83	27.69	3.14	0.575	5.46	S

Where,

M1 = Mean achievement score of grp.1, i.e., group of students taught by high effective teachers. N= 51

Fig.2: Showing significance of difference between M. Ach. Scores (Life Science) of two groups of students under high and low effective teachers



M2 = Mean achievement score of grp.2, i.e., group of students taught by low effective teachers. N=467 Accepted level of significance - 0.05

It is evident from the above table 2 that there is significant difference between the two groups in mean achievement scores in Life Science subject. The findings indicate that students do differ significantly in achievement in Life Science subject due to high or low teaching effectiveness of teachers; that is to say, students under teachers with high teaching effectiveness achieve significantly better than those under teachers with low teaching effectiveness. Therefore the hypothesis. 2 is retained. This implies that high teaching effectiveness has significant positive impact o n students' achievement in Life Science. The diagram above indicates the differences between the two mean values obtained from the mean achievement scores in Life Science subject under the different categories of teachers.

The results related with hypothesis 3 regarding that there is a substantial positive relationship between teacher competencies and teaching effectiveness (in Life Science subject) is given below. The null hypothesis is that the coefficient of correlation between teacher competence and teaching effectiveness will not be substantially positive. In order to verify the hypothesis 3 the co-efficient of correlation by product-moment method was computed. Results of the analysis are presented below with figure —

Table 3

Co-efficient of correlation between teacher competency scoresand teaching effectiveness scores by product-moment method

Variables	*N*	*Total scores*	*Mean*	*S.D.*	*'r'*	*Substantial*
T/C	35	4040	115.43	9.21	0.46	Positive
T/E	35	6311	165.5	12.02		Relation

Where, N=no. of teachers observed=35, T/C=total scores of teacher competency of teachers observed.

T/E=total scores of teaching effectiveness of teachers observed. Mean=average of the total scores taken.

S.D. = standard deviation score from the mean of the total scores.

Accepted level of significance: - 0.01.

Fig.3: Showing co-efficient of correlation between teacher competence scores and teacher effectiveness scores by product-moment method

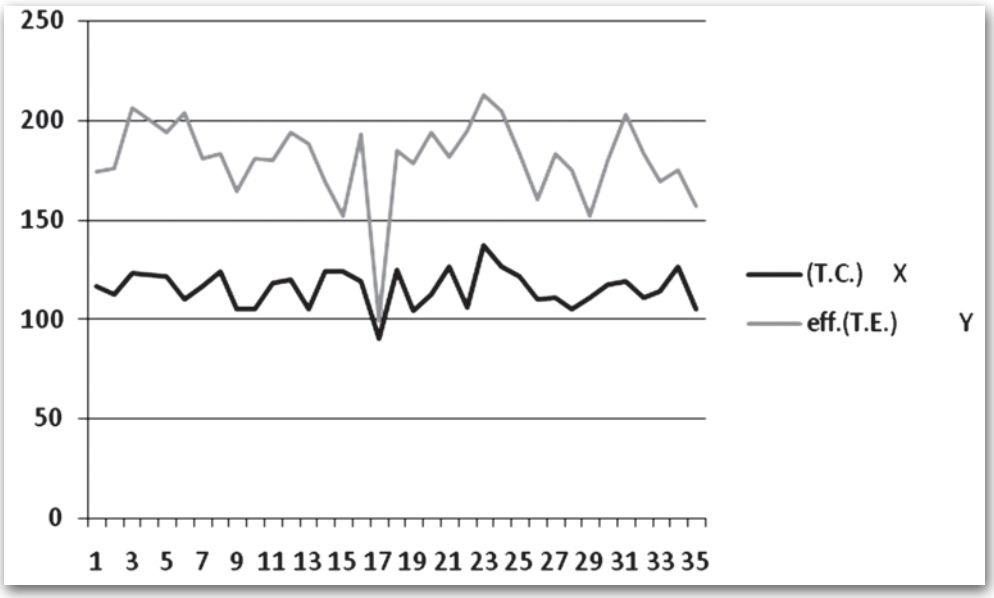
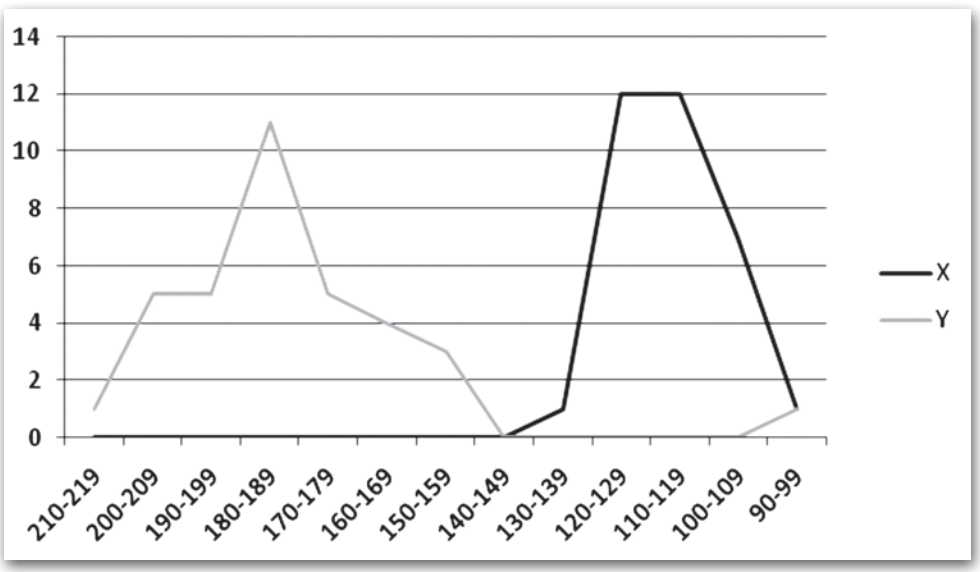


Fig.4: Showing co-efficient of correlation between teacher competence scores and teacher effectiveness scores by product-moment method



The above analysis shows the co-efficient of correlation between teacher competence and teaching effectiveness scores is 0.46 which falls within the range of substantial positive relationship. Therefore, hypothesis 3 is retained. The findings indicate that there is a substantial positive relationship between teacher competence and teaching effectiveness. Fig. 3 and Fig. 4 show the status and the relationship between the two independent variables X and Y, i.e., teacher competence and teaching effectiveness scores of the teachers obtained.

Major Findings of the Studies

On the basis of analysis, the following findings are made, i.e.,

1. The findings indicate that students do differ significantly in achievement of Life Science subject due to teaching by high or low competent teachers.
2. The findings indicate that students do differ significantly in achievement in Life Science subject due to high or low teaching effectiveness of teachers; that is to say, students under teachers with high teaching effectiveness achieve significantly better than those under teachers with low teaching effectiveness. This implies that high teaching effectiveness has significant positive impact on students' achievement in Life Science.
3. The findings indicate that there is a substantial positive relationship between teacher competence and teaching effectiveness scores obtained from the teachers observed.

Discussion

It is found that students do differ significantly in achievement in Life Science subject due to teaching by high or low competent teachers and also due to high or low teaching effectiveness of teachers, that is to say, students under high competent teachers and also under teachers with high teaching effectiveness achieve significantly better than those under low competent teachers and also under teacher with low teaching effectiveness. This implies that high competent teacher and high teaching effectiveness has significant positive impact on students' achievement in Life Science subject.

Hypothesis 3 shows the relationship between the independent variables teacher competence and teaching effectiveness. Substantial positive relationship is found between them.

Educational Implications and Suggestions

On the basis of analysis and findings of the study, following implications of the study, is suggested-

1. High competent teacher and high teaching effectiveness has significant positive impact on

students' achievement in Life Science subject, that is to say, students under high competent teachers and also under teachers with high teaching effectiveness achieve significantly better than those under low competent teachers and also under teacher with low teaching effectiveness. The findings indicate that students do differ significantly in achievement of Life Science subject due to teaching by high or low competent teachers and that high teaching effectiveness has significant positive impact on students' achievement in Life Science. Therefore, skills to develop teaching have to be nurtured by training.

2. There is significant correlation found between teacher competency and teaching effectiveness which signifies that teacher competency factors are related to teaching effectiveness. So, skills of teacher competency have to be developed for better teaching effectiveness through training.

Thus, for enhancing the students' achievement in Life Science there should be properly trained competent teachers who are acquainted with the latest methods of teaching, use of technological aids and have a through rapport with latest syllabi at the secondary level. Further, latest method of training should be provided to update the teacher with development of all the required skills for teaching. This is the requirement of the day so that they can put their best efforts for building the nation's citizens.

Summary and Conclusions

The main purpose of the present investigation was to study the impact of teacher competence and teaching effectiveness on students' achievement of Class VIII students of upper primary section of board schools. The study was an experimental-survey type in which the investigator attempted to study the importance of the qualities of teachers in influencing the achievements of students in Life Science subject. The important point to be noted was that the investigator wanted to find out whether teacher competency and teaching effectiveness both factors influenced achievement or not. Thus, an attempt was made to find out the importance of both the independent variables teacher competency and teaching effectiveness on the achievement of students in Life Science subject; the inter-relationships between the two on the achievement of students in Life Science subject of Class VIII students. The objectives of the present investigation were to assess the competencies and the teaching effectiveness of the Life Science teachers and to categorise them into high and low categories on the basis of their competencies and teaching effectiveness. It was

also done to find out the effect of teachers competencies and teaching effectiveness on students' achievements. Also, the relationship between teacher competence and teaching effectiveness was established.

The present study deals with the students of Class VIII in Life Science subject who were taken as sample for the study along with the Life Science teachers. As Life Science is an important subject of the School board curriculum, the researcher was interested to see whether the qualities teacher competency and teaching effectiveness was the reason behind the students' achievement in that subject. Researches in the field indicate that the factor behind the students' success depends on the teacher in the classroom though other congenial factors may also contribute to their success. Considering the fact that it was impossible for a researcher to identify all possible reasons behind the students' success, or to trace out the actual causes of success of the students, the researcher, in her/his present study, made a humble effort to identify only the qualities of teachers behind the students' achievement success in Life Science subject. Qualities of teachers were the focal point of this study as it was fact that the achievement of students' depends on the qualities of teachers. The study did not penetrate deep enough to reveal the different causes of achievement because the researcher has focused only on the qualities of teachers' required for students' achievement in Life Science subject. The study focused on the matter that a competent teacher can teach effectively which emphasises the point that both teacher competency and teaching effectiveness are the factors behind the students' achievement and thus positively related.

REFERENCES

Aggarwal, J.C. 2001. *"Teaching Skills and Teacher Competency, Teacher and Education in a Developing Society"*, Vikas Publishing House, PVT. LTD.

Albone Eric. 2004. *Science in Parliament,* spring 2004, Text of a Presentation to the Parliamentary and Scientific Committee Place of West minister.

Anand, S.P. 2004. *School Management for Quality Education in 21st Century* (2nd edition). Mahamaya Publishing House, New Delhi (India).

Bourai, H.H.A. 2000. *Dynamic teaching,* Chug Publication, New Delhi.

Bansibihary, Pandit and Surwade, Lata. 2006. *The Effect of Emotional Maturity on Teacher Effectiveness. EDUTRACKS*, Vol.6-NO.1.

Bhardwaj Pandey Amita. 2010. *Needed Competencies for the Teachers in the 21st Century*, *University News*. 48 (42) Oct, 18-24. New Delhi.

Banerjee, Mita and Sridipa Sinha. 2010. "Impact of Micro Teaching in enhancing the skill of explaining in the B.Ed. Students in Burdwan, West Bengal", *Sikshachintan*. Vol.4:95, 102.

Choubey K.P. 1965-66. *'Improvement of Teachers' Professional Competency in the use of Classroom Technique.* Project Report No. 3; Research in Classroom Vol-2 Reports of Experiments and Projects, NCERT.

Chauhan, S.S. 2000. *Innovation in Teaching Learning Process.* Vikas Publishing House Pvt. Ltd. New Delhi.

Darling-Hammond, L. 1997. The bright to learn: A Blueprint for creating school that work. San Trancisco : Jossey-Bass

Darling-Hammond, Linda. 2000. "Teacher Quality and Student Achievement: A Review of State Policy Evidence", Education Policy Analysis Archives: Volume 8 Number 1 January 1, 2000 ISSN 1068-2341, Stanford University. (Shulman, 1986, Grossman, 1995, Westera, 2001 cited in this study), (Chapman and Mählck, 1997, Kanu, 1996, Châu, 1996 cited in this study).

Ding, Cody, Sherman, Helene. 2006. "Teaching Effectiveness and Student Achievement: Examining the Relationship." *Educational Research Quarterly*. Vol. 29, No. 4. (2006), pp. 39-49 Key: cite like: 1623162.

Hough, B. John and K Duncan James. 1970. *Teaching: Description and Analysis.* ADDLSON-WESLEY PUBLISING COMPANY Reading Massachusetts, Menlo Park, California, London Don Mills. Ontario.

Houstan, W. R. 1987. Competency-based teacher education. In M.J. Dunkin (Ed.), The international encyclopedia of teaching and teacher education. Oxford: Pergamon Press, 86-94.

IGNOU Study Materials Course ES-333. 1998. *Educational Evaluation, Evaluation in Teaching-Learning Process.* NCERT, New Delhi.

_____ 1998. *Educational Evaluation, Learner's Evaluation.* NCERT, New Delhi.

Jangira, Pinki and N.K. Jangira. 1995. *Effective Teaching, Child Centered Approach.* National Publishing House, 23, Daryaganj, New Delhi.

Laurence, J. J. Peter. 1975. *Competencies for teaching: Teacher Education.* Wordsworth Publishing Company, Inc. Belmont, California.

Mohalik, Ramakanta. 2008. Impact of In-service Teacher Education Programmes on Teacher Effectiveness and Students Achievement in English, *Journal of Indian Education,* Vol. XXXIV Pg. 70 .No1.

Nanda, S. K. 1991. *Indian Education and its problems today, Secondary Education.* Kalyani Publishers, New Delhi-Ludhiana.

NCERT, *National Curriculum Framework.* 2005, New Delhi.

Najma, Unnisa. 2007. *Role of Teachers in 21ST century.* EDUTRACKS, Vol.6-NO.12.

Pandey Damyanti. 2002. *General Teaching Competency and Attitude of Economics Teachers' Relationship with Student Moral and Achievement-* A Research Study (Unpublished work). Ph.D. Thesis submitted to Delhi Univ.

Parmar, Shalini, Q. Haider. and Vibha Joshi. 2008. "Attitude of Student Teachers towards Teaching Profession and Teaching Competency" *University News*. 46 (17) April 28-May 04.

Robinson, Adjai. 1980. *Principles and Practice of Teaching.* Published – George Allen and Unwin Publishers Ltd.

Reddy, R.S. 1998. *Principles and Practices of Teacher Education.* Commonwealth Publishers, Ansari Road, New Delhi.

Ramasami. 2007. July 2nd-*Science Education: At the Core of National Development.* Professor G. Ram. Reddy Memorial Lecture. IGNOU, New Delhi.

Siddiqi and Siddiqi. 1983. *Aims and Objectives of Teaching Education, Teaching of Science.* Harman Publishing House, New Delhi.

Singh, R. S. 1992. *"Teachers' Effectiveness in India".* Chugh Publication. Allahabad.

Sharma, Shashi, Prabha. 2001. *"Teacher Education Principles, Theories and Practices".* Kanishka Publishers, Distributors. New Delhi.

Tarachand. 1991. "*Principles of Teaching".* Anmol Publication, New Delhi.

Teven, J. Jason and L. Trudy Hanson. 2004. "The Impact of Teacher Immediacy and Perceived caring on Teacher Competence and Trustworthiness". *Communication Quarterly.* Vol.52, NO1, winter 2004, pp. 39-53.