

ISSN 0970-9827

**JOURNAL
OF
ALL INDIA ASSOCIATION
FOR
EDUCATIONAL
RESEARCH**

A Peer Reviewed Journal

Vol .31

Nos.1 & 2

June & December 2019

**JOURNAL OF ALL INDIA ASSOCIATION FOR
EDUCATIONAL RESEARCH**

Volume 31

Numbers 1&2

June & December 2019

CONTENTS

1. Editorial - Learning at Pre-Birth Stage
- *Dr. Sunil Behari Mohanty* 1-2
2. Effectiveness of ICT Integrated Teaching in Developing
Higher Order Thinking Skills Among Standard VIII
Students in Science
-*Prof. Bhujendra Nath Panda & Ms. Monalisa Dash* 3-13
3. Status of Science Teaching in Middle Schools in Siaha
District
-*Dr. Thockchom Budha Singh* 14-32
4. Assessment of Impact of Right to Education (RTE)
Act 2009 in Haridwar District
-*Ms. Anamika Chauhan* 33-48
5. Teacher Effectiveness of Primary School Teachers in Mauritius
-*Ms. Sharone Ramasawmy, Prof. Vimala Veeraraghavan,
& Prof. Ananda Padhan* 49-62
6. Gender Influence on the Development of Science Teaching
Confidence in Primary Pre-Service Teachers Because of
Constructivist Science Education Course.
- *Prof. Vinod Kumar Gupta* 63-81
7. Teaching Competency of Secondary School Teachers
in Relation to Their Age, Experience and Gender
- *Dr. Narayan Prasad Behera* 82-99
8. Guideliness for Manuscript Submission 100-102
9. Editorial Board 103
10. List of Reviewers 104

EDITORIAL

LEARNING AT PRE-BIRTH STAGE

Sunil Behari Mohanty

INTRODUCTION

The Mahabharata, the great epic, narrates the story of Abhimanyu, who, while in his mother's womb had learnt about technique of penetrating wheel like formation of soldiers in a face to face battle of those days (Mohanty 2012). There are many such instances for which Indian culture gives much respect to the pregnant ladies and expects them to be pious and carry out noble and spiritual activities. In 2008, Early Years Framework document of the Government of Scotland of UK defined early years as pre-birth to 8 years old and recognized the "importance of pregnancy in influencing outcomes and that the transition into primary school is a critical period in children's lives." (Scottish Government 2008, p.3). Learning and Teaching Scotland (2010, p.15) stated that "Babies start to learn in the womb, particularly in the last trimester. They are born able to recognise familiar sounds and they have already developed some taste preferences."

Mahatma Gandhi had said that

"The education of the child begins with conception. The physical and mental states of the parents at the moment of conception are reproduced in the baby. Then during the period of pregnancy it continues to be affected by the mother's moods, desires and temperament, as also by her ways of life. After birth the child imitates the parents, and for a considerable number of years entirely depends on them for its growth." (Gandhi 1927, p. 232).

Nearly seventy years ago, in 1951, The Mother of Sri Aurobindo Ashram, Puducherry stated that

“For it is certain that the nature of the child to be born depends very much upon the mother who forms it, upon her aspiration and will as well as upon the material surroundings in which she lives. To see that her thoughts are always beautiful and pure, her feelings always noble and fine, her material surroundings as harmonious as possible and full of a great simplicity—this is the part of education which should apply to the mother herself. And if she has in addition a conscious and definite will to form the child according to the highest ideal, she can conceive, then the very best conditions will be realised so that the child can come into the world with his utmost potentialities. How many difficult efforts and useless complications would be avoided in this way!” (The Mother 1951, p. 11).

It is high time that the nation gives stress on this aspect of learning, which is not only useful for intellectual , but also socio-emotional development of children.

REFERENCES

- Gandhi, M. K. (1927) *An Autobiography or The Story of My Experiments with Truth (Translated from the Original in Gujarati by Mahadev Desai)*. Navajivan Publishing House, Ahmedabad.
<https://www.mkgandhi.org/autobio/autobio.htm>
- Learning and Teaching Scotland (2010) *Pre-Birth to Three: Positive Outcomes for Scotland's Children and Families-National Guidance*. Author, Glasgow.
http://www.educationscotland.gov.uk/Images/PreBirthToThreeBooklet_tcm4-633448.pdf
- Mohanty, S. B. (2012) Indian culture and learning. In P. Jarvis & M. Watts (Eds.), *The Routledge International Handbook of Learning*, pp. (526-533). Routledge, Abingdon.
- Scottish Government (2008) *The Early Years Framework*. Author, Edinburgh.
<http://www.gov.scot/resource/doc/257007/0076309.pdf>
- The Mother (1951) Education. *Bulletin of Physical Education* 3, 1, 11-17, February. p.11. In The Mother (2002) *On Education (Collected Works of The Mother Vol. 12) 2nd Edition*. Sri Aurobindo Ashram, Puducherry. p.9.

EFFECTIVENESS OF ICT INTEGRATED TEACHING IN DEVELOPING HIGHER ORDER THINKING SKILLS AMONG STANDARD VIII STUDENTS IN SCIENCE

**Bhujendra Nath Panda
Monalisa Dash**

In the process of transitioning from teacher-centred instruction to learner-centred instruction, Information and Communication Technology (ICT) plays a vital role. In this background, the investigators conducted this study to determine the effectiveness of ICT integrated teaching in developing the Higher Order Thinking Skills (HOTS) among standard VIII students in science. The investigators employed a Quasi –Experimental method. The sample consisted of 76 students of class VIII selected purposefully from the students of Govt girls' high school, Unit-IX, Bhubaneswar. A self - developed achievement test consisting of 25 items were used to measure the HOTS of students. The study found that i) there is no significant difference between pre-test scores of experimental group and control group in science achievement at 0.01 level, ii) there is a significant difference between post-test scores of experimental group and control group in science achievement at 0.01 level, iii) there is a significant difference between gain scores in analysing, evaluating and creating skills of experimental group and control group in science achievement at 0.01 level, iv) there is a significant difference between gain scores of slow learners of experimental group and control group in science achievement at 0.01 level. The study has implications for facilitation in higher order of inquiry processes and improvement of slow learners.

INTRODUCTION

Science is a dynamic, expanding body of knowledge, covering even new domains of experience. In a progressive forward-looking society, science can play a truly liberating role, helping people escape from the vicious cycle of poverty, ignorance and superstition (NCERT, 2005). Good science education is true to the child, true to life and true to science. Secondary education serves as a bridge between elementary and higher education and prepares young people between the age group of 14-18 for entry into higher education. So science education at secondary level must not focus only on mere acquisition of knowledge rather it should focus on the internalization of the concepts as well as practical utilization of those concepts.

This internalization of concepts requires development of Higher-order Thinking Skills (HOTS) namely the Analysing skills, the Evaluating skills and the Creating skills. In order to develop students' HOTS, teachers should promote student engagement with learning tasks which exceed the third level 'application' in order to encourage analysis, evaluation and creation activities in processing information. This resonates with the notion that HOTS encompasses any thinking skills which require more than mere recall or memorization of information (Ivie, 1998; Underbakke, Borg & Peterson, 1993).

Over the decades, the aim of developing and enhancing students' HOT has been a major educational goal (Fisher, 1999; Marzano, 1993; Supon, 1998; Zohar & Schwartz, 2005). As Resnick in 2010 said, "scaling up the 'thinking curriculum' in a way that will foster proficiency for all students is currently a major educational challenge" (as cited in Zohar, 2013, p. 234); and a primary glance at teachers' perspective tells us that most teachers agree that it is crucial to teach students HOT, primarily to guide their idea generation (Yee et al., 2012). This commitment toward HOT is relevant to global economic growth, the development of

information and communications technology (ICT), a knowledge-based economy and a fast-paced world. In reality, HOT is an extremely needed skill for every individual in any educational setting. Also, Fisher (1999) believes that the development of students' HOT is complementary with the inculcation of lifelong learning among them. In other words, we need "thinking" students who can incessantly respond to real-world demands (Vijayaratnam, 2012).

Generally two approaches are followed for teaching science at upper primary level; one is conventional or teacher centered, examples are teaching through lecturing, demonstrating etc and another is constructivist approach of teaching science. The conventional way of teaching science is not very much compatible with learning by doing. As side effects, sciences are perceived as cryptic, difficult and require a student to be very smart. Another approach of teaching science is the constructivist approach which transforms the student from a passive recipient of information to an active participant in the learning process, Always guided by the teacher, students construct their knowledge actively rather than just mechanically ingesting knowledge from the teacher or the text book. The various strategies used in this approach of teaching science are problem solving method, heuristic method, cooperative learning, project based method and concept mapping etc. These methods can be incorporated in the classroom teaching with the help of ICT.

While definitions of ICTs are varied, it might be useful to accept the definition provided by United Nations Development Programme (UNDP): 'ICTs are basically information-handling tools- a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. They include the 'old' ICTs of radio, television and telephone, and the 'new' ICTs of computers, satellite and wireless technology and the Internet. These different tools are now able to work together, and combine to form our 'networked world' – a

massive infrastructure of interconnected telephone services, standardized computing hardware, the internet, radio and television, which reaches into every corner of the globe'. When we talk of ICTs, we refer not only to the latest computer and Internet based technologies, but also to simple audio visual aids such as the transparency and slides, tape and cassette recorders and radio; video cassettes and television; and film.

RATIONALE OF THE STUDY

Today the world is facing a problem of 3P- population, pollution and poverty. The developmental efforts of the developing countries, such as India are nullified by increasing population, pollution and poverty. Science and technology can contribute to the solution of the problems of the country. Thus science education is an important component of the education system in India. Science is not a thing to be memorized but a practical subject to visualize. The correct way to learn it is by doing. But the first-hand experience is not always possible. For example, it is not desirable for the students to have direct experience of recognizing the characteristics, effects and remedies of any fatal disease, say plague. At some other times the actual material is inaccessible, very expensive or physically so constituted that they cannot be easily studied. ICT proves a great boon in all these situations. Again ICT intends to impart knowledge to the pupils through different senses to ensure quick and effective learning. This makes learning joyful. The NCF 2005 has also recommended the use of ICT in science at the elementary stage (NCERT, 2005). McMahon's study (2009) showed that there were statistically significant correlations between studying with ICT and the acquisition of critical thinking skills. Current research has indicated that ICT assists in transforming a teaching environment into a learner-centered one (Castro , Sánchez & Alemán 2011). Since learners are actively involved in the learning processes in ICT classrooms, they are authorized by the teacher to make decisions, plans, and so forth (Lu, Hou & Huang 2010). ICT therefore provides both learners and instructors with more

educational affordances and possibilities.

It is therefore pertinent at this critical time when high premium is placed on science and technology as the bedrock of national development and advancement to search for an approach for teaching science in order to enhance maximum outcome. Most of the studies cited are conducted in foreign context and it is high time to study the effect of ICT integrated teaching approaches on students' performance in Odisha. Similarly the differences in impact from learning perspective is to be studied. Keeping in view the aforesaid words the investigator has undertaken the study.

OBJECTIVES

The present study has the following objectives:

1. To find out the effectiveness of ICT integrated teaching in developing HOTS among class VIII students in science with regards to pre-test and post-test scores.
2. To compare dimension wise, the HOTS developed through ICT integrated teaching over Traditional methods of teaching in science with regards to gain scores.
3. To compare the performance of slow learners taught through ICT integration over Traditional method.

HYPOTHESES

1. There exists no significant difference between pre-test scores of experimental group and control group in science achievement.
2. There exists no significant difference between post-test score of experimental group and control group in science achievement.
3. There exists no significant difference between gain scores in

analysing, evaluating and creating skills of experimental group and control group in science achievement.

4. There exists no significant difference between the gain scores of slow learners of experimental group and control group in science achievement.

METHODOLOGY

A pre-test post-test Quasi-Experimental design was employed for conducting the study. Here the Govt Girls' High School, Unit-IX, Bhubaneswar was selected purposively. All the 76 students of class VIII were selected for the sample. Keeping the class VIII intact section A consisting of 38 students was selected as control group and section B was selected as experimental group randomly.

Five lesson plans on each strategy i.e, Traditional method of teaching (for section A) and ICT integrated teaching method (for section B) were used as instructional strategies. Moreover 5 power point presentations with embedded videos on different topics were developed and used for the experimental group. One measuring tool like achievement test (40% MCQs and 60% very short answer type test items) was used for collecting data. The achievement test consisted of 40% analysing, 40% evaluating and 20% creating items related to the topic – “Stars and Solar system”. Construct validity was established by seeking advice of 5 experts. The preliminary draft of the test comprised of 30 questions out of which 5 items were further revised with the critical comments of the expert group. Moreover 2 items that seemed redundant were removed from the test. For determining the reliability of the test it was tried out on a sample of 20 students of class VIII. A split half method was adopted to establish the reliability. The items with Spearman correlation coefficient ranging from 0.60-0.91 were retained in the test and 3 items with low correlation coefficient ranging from 0.39-0.50 were excluded. Thus, 3 items were deleted from the test. Thus the final draft of the test contained 25 items.

The initial achievement scores (pre-test scores) of both the groups were recorded by the help of teacher-made achievement test in science. After the completion of the treatment, both the groups were again tested by the same teacher made achievement test. Post- test scores of both the groups were compared to see the effect of ICT integrated teaching approach on achievement in science. The post-test scores of experimental group and control group were further analysed to study the effect of ICT integrated teaching approach on higher order thinking skills in science of slow learners in both the groups. For analysing the data both descriptive and inferential statistics were adopted.

MAJOR FINDINGS

The following findings are drawn from the study:

1. There is no significant difference between pre-test score of control group and experimental group. This indicates that the two groups used in the study are equal in the level of higher order thinking skills in science.
(M1=6.74, M2=6.63 & t-value=0.119)
2. There is a significant difference between the post-test score of control group and experimental group. The difference is statistically significant at 0.01 levels, that is, the experimental group performed much better than the control group in their achievement test in science.
(M1=9.42, M2=13.24 & t-value=4.374)
3. There is a significant difference between the gain score in analysing skills of control group and experimental group.
(M1=2.11, M2=3.61 & t-value=3.419)
4. There is a significant difference between the gain score in evaluating skills of control group and experimental group.
(M1=0.61, M2=2.68 & t-value=6.138)
5. There is a significant difference between the gain score in creating

skills of control group and experimental group.

($M_1=0.05$, $M_2=0.34$ & $t\text{-value}=3.650$)

And the difference is statistically significant at 0.01 levels. This implies students of experimental group developed better higher order thinking skills in analysis, evaluation and creative dimensions in science than the control group.

6. There is a significant difference between the gain score of slow learners of control group and experimental group. The difference is statistically significant at 0.01 levels. That means the slow learners in experimental group performed much better than the control group in their achievement test in science.
($M_1=2.58$, $M_2=7.19$ & $t\text{-value}=5.726$)
7. All students of experimental group were attentive throughout the science class but the students in control group lacked attentiveness.
8. Students of experimental group taught through ICT seemed interested and curious in the classroom situation.

EDUCATIONAL IMPLICATIONS OF THE STUDY

In ICT integrated teaching approach, students develop greater interest and better attitude towards the subject learnt than in traditional teaching approach. ICT provides conducive learning environment. It accelerates the learning process. It arises curiosity among students and feeds more senses than done in traditional teaching. A pleasurable learning maximizes the performance of students. Hence ICT integrated teaching approach can prove to be substantial in fulfilling the need in teaching learning situation by providing quality improvement instruction.

The present study has some practical aspects that may be implemented in the educational system. These are as follows:

1. ICT integrated teaching-learning approach is very psychological

- since it's a joyful learning. It also encourages learning by doing.
2. It provides pleasure and interest in classroom situation.
 3. This method can develop subject performance of students effectively.
 4. It can develop academic performance of the students effectively.
 5. This method works wonders for slow learners as well.
 6. It develops the habit of keen observation and critical thinking.
 7. This method of teaching develops scientific thinking.
 8. It facilitates higher order of inquiry processes.
 9. It maximizes autonomy.
 10. If senses are considered as the gateways of knowledge, then ICT integrated teaching can be used appropriately for gaining knowledge as more number of senses are involved than done in the traditional method of teaching.

CONCLUSION

It is concluded that the present study on ICT integrated teaching enhances higher order thinking skills in science of class VIII students. Not only the average students but also the slow learners gain significantly by this method. This method creates interest and curiosity simultaneously. This assists in understanding the logic in science rather than memorizing mere concepts. It makes the mind active and develops the attitude of critical thinking. The result of the study indicates that experimental group has greater mean of higher thinking skills than the control group in post-test. Thus it is concluded that ICT integrated teaching method has significant positive effect in enhancing higher thinking skills in science.

REFERENCES

- Castro Sánchez, J. J., & Alemán, E. C. (2011) Teachers' opinion survey on the use of ICT tools to support attendance-based teaching. *Journal Computers and Education* 56, 3, 911-915.
- Fisher, R. (1999) Thinking skills to thinking schools: Ways to develop children's thinking and learning. *Early Child Development and Care* 153, 1, 51-63.
- Ivie, S. D. (1998) Ausubel's learning theory: An approach to teaching higher order thinking skills. *The High School Journal* 82, 1, 35-42.
- Lu, Z., Hou, L., & Huang, X. (2010) A research on a student-centered teaching model in an ICT based English audio-video speaking class. *International Journal of Education and Development using Information and Communication Technology* 6, 3, 101-123.
- Marzano, R. J. (1993) How classroom teachers approach the teaching of thinking. *Theory into Practice* 32, 3, 154-160.
- McMahon, G. (2009) Critical thinking and ICT integration in a Western Australian secondary school. *Educational Technology and Society* 12, 4, 269-281.
- NCERT (2005) *National Curriculum Framework 2005*. Author, New Delhi.
- Supon, V. (1998) Penetrating the barriers to teaching higher thinking. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas* 71, 5, 294-296.
- Underbakke, M., Borg, J. M., & Peterson, D. (1993) Researching and developing the knowledge base for teaching higher order thinking. *Theory into Practice* 32, 3, 138-146.
- Vijayaratnam, P. (2012) *Developing higher order thinking skills and team commitment via group problem solving: A bridge to the real world*. Paper presented at the 8th International Language for Specific Purposes (LSP) Seminar: Aligning Theoretical Knowledge with Professional Practice. Retrieved from http://ac.els-cdn.com/S1877042812052329/1-s2.0-S1877042812052329-main.pdf?_tid=c453f28e-ae50-11e3-a724-00000aab0f6b&acdnat=1395114946_44da701f87f46a3de36458c460bfd40e
- Yee, M. H., Md Yunos, J., Othman, W., Hassan, R., Tee, T. K., & Mohamad, M. M. (2012) *The needs analysis of learning higher order thinking skills for generating ideas*. Paper presented at the UKM Teaching and Learning Congress 2011. Retrieved from <http://ac.els-cdn.com/>

S1877042812037135/1-s2.0-S1877042812037135-main.pdf?_tid=65f58d48-ae4a-11e3-838a00000aab0f26&acdnat=1395112211_a1e428dbe7067ae97d9de922c06bad68

Zohar, A. (2013) Challenges in wide scale implementation efforts to foster higher order thinking (HOT) in science education across a whole wide system. *Thinking Skills and Creativity* 10, 233-249.

Zohar, A., & Schwartz, N. (2005) Assessing teachers' pedagogical knowledge in the context of teaching higher-order thinking. *International Journal of Science Education* 27, 13, 1595-1620.

AUTHORS:

Ms. Monalisa Dash, Lecturer in Education, Brajaraj Nagar College, BRAJARAJNAGAR, Dt. Jharsuguda- 768 216 Odisha
E-mail: monalisa_padhiari@yahoo.co.in

Prof. Bhujendra Nath Panda, Dean, Research, Regional Institute of Education (NCERT), BHUBANESWAR-751 022 Odisha
E-mail: bnpanda38@hotmail.com

STATUS OF SCIENCE TEACHING IN MIDDLE SCHOOLS IN SIAHA DISTRICT

Thockchom Budha Singh

This paper is an attempt to examine the current status of science teaching in middle schools in Siaha District. A purposive sample of 23 schools under different categories of management was selected for the study. The data were collected through questionnaire cum interview schedule and analyzed by using descriptive statistics. The findings were: (i) majority of the teachers dealing with science were Arts graduates (ii) majority of the teachers were trained (iii) majority of the teachers participated in short-term training (iv) majority of the teachers did not prepare lesson plan (v) majority of the schools did not have science kits, equipment.etc. (vi) textbook method (reading and explaining) and question-answer methods (note writing on board/note dictating) were mainly used by the teachers and (vii) majority of the teachers used vernacular language as medium of instruction and were not comfortable with English in teaching science as well.

INTRODUCTION

Science education occupies an important place in the school curriculum of every country right from the primary stage as it has great potential for the development of a country. The importance of science education in the modern world cannot be over emphasized. It dominates our lives and presents us with tremendous opportunities and challenges because there is no aspect of man's life which has not been influenced by science in one way or the other. Science discovers new knowledge and technology utilizes this new knowledge to produce better and more useful materials that make living easier and safer.

Emphasizing the importance of the study of science, the Science Policy Resolution passed by Indian Parliament in 1958 stated that the key to national

prosperity, apart from the spirit of people lies in the modern age, in the effective combination of three factors – technology, raw materials and capital, of which first one is the most important, since the creation and adoption of new scientific techniques can, in fact, make up for a deficiency in natural resources, and reduce the demands on capital. But technology can only grow of the study of science and its application (Sarabhai, 1974).

Science is a great human enterprise. It strengthens national economies, creates new resources, accelerates employment and attempts to build a global outlook on problems which affect man, his life and society. It can be stated without any hesitation that science has contributed in all walks of life. Science has, in fact, transformed man's life style and brought about tremendous changes in the way of thinking, attitudes, interests, outlook, value system and new pattern of interaction with environment. Considering the immense value and utility to individual's life and society, the various committees and commissions formed and appointed from time to time to study and review the problems of Indian education have unanimously suggested that science education be made compulsory part of general education. Science education was thus made an important part of curriculum up to secondary stage. However, science education at the primary stage has not been received due attention as it should.

In the present context of rapid development of global technology base, it is imperative that all students in schools should have firm education in science and technology so that they can cope with the advent of modern technology embracing all spheres of daily life. Tomorrow's work force will be based on the preparation of today's students (Ghosh, 2006). But this cannot happen overnight. This is possible only through sound science education right from the primary stage and continuing through higher education. Science teaching can become meaningful and useful only if the methods of teaching are vitalized and proper facilities are provided for the teaching of the subject (Kothari 1966).

Science is essentially a practical subject and that the young pupils like doing something rather than simply listening. Science, being process-based in nature requires adequate resources. Lack of availability of resources, both physical and human, affects the quality of delivery system of curriculum. Various scientific skills or processes were found to be developed in children while teaching science

through activity-based approaches like spirit of enquiry, objectivity, courage to questions, problem-solving, decision-making, investigating, scientific attitude and temper, etc. and reduces all sort of prejudices based on sex, religion and language (Siddiqi, 1995). Science as a subject consists of a body of facts, principles, theories and laws. Science can best be learnt through doing or practical work. Science practical work can be used to help students achieve a number of learning outcomes, including: getting a feel for natural phenomenon, developing investigation skills and processes, providing a platform of experiences on which conceptual understanding can be built, giving students a sense of nature of science, and the excitement of inquiry and discovery. Practical work provides opportunities for students to develop learning outcomes that contribute to scientific literacy including the skills and understanding needed to conduct scientific investigations and to critically evaluate the claims made by others based on scientific evidence (Venville & Dawson, 2004). For making science instruction effective, students must be provided hands-on-experiences in science and more so at the primary level. Such opportunities could easily be given through inexpensive materials easily available in the immediate environment (Kishore & Agarwal, 1991). Examining the status of science teaching in schools, Jain (2004) reported that there was dominant use of textbook and the use of concrete material, teaching aids, environmental objects, displayed material, science kits, supplementary reading materials which enrich the teaching-learning process was an occasional feature in the science classrooms. The study also stated that the science laboratory was an ornamental thing for children even at the upper primary stage. In a similar study conducted by Kishore (1992) pointed out that the reason for poor quality of science instructions in primary classrooms is associated with the non-concrete science experiences given to students. According to Sarma Dev (2002) most of the teachers manning the school system do not have science background and their base in mathematics in particular is not so strong. The real constraint to the development of Science and Technology in the North Eastern Hill Region can be traced to the inadequate attention and arrangements for science and mathematics education right from the school system. It is, therefore, highly desirable to give the highest priority in science and mathematics education right from the elementary stage.

Significance of the Study

Siaha district is economically one of the most backward districts in Mizoram. Yet the district has been steadily growing and has made a considerable expansion in education particularly from Primary to Higher Secondary School stage. The first school in Siaha district was established at Saikao village by R.A. Lorrain, a Christian missionary, on August 24, 1908 (Lorrain, 1988). At present, the district has 133 Primary, 90 Middle/Upper Primary, 36 High and 7 Higher Secondary Schools. Out of the 7 Higher Secondary Schools, science is offered in 2 schools, one each in Government (Govt. Hr. Sec. School) and Private (Don Bosco Hr. Sec. School) school. The number of enrolment, however, in Science has been far less in number when compared with Arts at this stage in the district. There could be multiple reasons for this kind of affairs such as the economic status of the family of the students, negative attitude of the students towards science, etc. But from the observation, the investigator feels that taking science as difficult subject by majority of the students may be considered as the most important reason.

The district does not have facility for higher education in science although it is one of the oldest districts in the state. Children of only a few affluent families can afford to go outside of the district and other states for higher education in science. As a result, the number of graduate and post-graduate degree holders in science in the district is still very less. If science education is not given due attention right from the middle/upper primary stage by the concerned authorities then the whole concept, initiative and efforts of the Ministry of Science and Technology, Government of India to promote science by providing scholarship for Higher Education will have little bearing.

It has been revealed by the District Council Education Officer (**DCEO**) of Mara Autonomous District Council (MADC) who is the second highest authority in the hierarchy of the Department of Education that the council does not have any clear recruitment rules for appointment of science teachers for middle schools. Similar statement has also been given by the District Education Officer (DEO), who heads the School Education at the district level under the Directorate of School Education, Government of Mizoram. Furthermore, the two officials divulged that since there is no clear recruitment rule, State Government and

District Council make appointment of teachers without making any specification. This clearly reflects that the minimum qualifications laid down by National Council for Teacher Education (NCTE) in August, 2010 for appointment as teacher in classes VI- VIII has not been given due importance by both the State Government and District Council. This also implies that there are teachers without proper science background teaching science in many middle schools in the district. In a study conducted by Singh (2004) reported that 33.35% of the teachers manning the subject do not have requisite qualifications and 75% of the sample schools are without laboratory. Meanwhile, not even a single study of this kind at the middle school stage has been carried out in the district to explore the prevailing condition of science teaching. Hence, the present study assumes significance as it is the first of its kind not only in Siahia district but also in the entire state that examines the current status of science teaching in the middle schools and suggests measures for its improvement. The study, although limited in scope will have some implications across the state.

Statement of the Problem

The purpose of the present study is to examine and analyse the current status of science teaching in middle schools in Siahia District and as such the problem has been stated as “Current Status of Science Teaching in Middle Schools in Siahia District.”

Objectives of the Study

1. To prepare the profile of science teachers of Government, Deficit, SSA and Private school.
2. To examine the participation of teachers in short-term training such as refresher course.
3. To examine the availability of teaching aids such as science kits, equipment, etc.
4. To examine whether teachers prepare lesson plan or not in teaching science.
5. To examine the methods of science teaching adopted by the teachers.
6. To study the medium of instruction used by the teachers in teaching science.

7. To study whether or not the teachers are comfortable with English in teaching science.
8. To suggest measures for the improvement of the status of teaching science.

Definition of Terms Used

1. **Science Teachers:** Teachers teaching science at the Middle Schools.
2. **Middle/Upper Primary Schools:** Schools having classes from V—VIII.
3. **Government Schools:** Schools fully financed and managed by Govt. of Mizoram/MADC.
4. **Deficit Schools:** Schools where teachers are given pay and allowances equal to Govt. school teachers but without retirement benefit.
5. **SSA Schools:** Schools managed by Sarva Shiksha Abhiyan.
6. **Private Schools:** Schools opened by private bodies with due permission from Education Department, MADC.

Delimitation

The present study has been confined to five categories of middle schools under different management functioning in Siaha District.

Methodology

As the present study aims to examine the current status of science teaching, descriptive survey method has been used. The population of the study comprised of all the 90 middle schools available in Siaha district under different categories of management. Of this, 41 schools were Government (26 Govt. of Mizoram, 15 MADC), 9 Deficit (MADC), 25 SSA and 15 Private. The information regarding the number of schools was obtained from District Education Officer, Siaha and District Council Education Officer of MADC. Altogether a sample of 23 schools distributed in five categories of management namely: government schools (State), government schools (MADC), deficit schools (MADC), SSA schools and private schools located in district capital Siaha and its adjoining areas was purposely selected. The detail sample of the study is given below.

Table I

| Types of Schools | No. of Schools | No. of Teachers Interviewed | No. of Headmaters/ Principals Interviewed |
|-------------------------|-----------------------|------------------------------------|--|
| Govt.(State) | 5 | 5 | 5 |
| Govt. (MADC) | 5 | 5 | 5 |
| Deficit (MADC) | 5 | 5 | 5 |
| SSA | 3 | 3 | 3 |
| Private | 5 | 5 | 5 |
| Total | 23 | 23 | 23 |

Collection of Data

The data regarding teachers' profile such as academic qualifications, professional qualifications, participation in short term training; and educational facilities along with availability of science kits, preparation of lesson plan, teaching-learning method sand medium of instruction were collected through questionnaire cum interview schedule. The study being descriptive in nature, analysis of data was done with the help of descriptive statistics such as frequency distribution, percentage, etc.

ANALYSIS AND DISCUSSION OF RESULTS

Academic Qualifications of Teachers

It is a well known fact that academic qualifications of teachers are important for effective transaction of curriculum at any stage of education. It is also a general perception that if students are taught by qualified teachers, students will learn better. Quality of learning provided in the institution depends largely on quality of teachers. The quality of a good teacher cannot be compromised with infrastructure. The Secondary Education Commission (1952-53) rightly stated that "even the best curriculum and the most perfect syllabus remains dead unless quickened into life by

the right method of teaching and the right kind of teacher.” (Mudaliar 1953). Right to education also means right to qualified teachers. Student learning of a subject depends on teachers having adequate knowledge of that subject. Lack of qualified teacher in a subject may affect not only the academic achievement of students in the subject but also the intellectual curiosity of learners. An attempt has, therefore, been made to analyze the qualifications of teachers, presently teaching science at middle schools under different categories of management to see whether or not, the students are being taught science by the right kind of teachers. The details were presented in the following table.

Table 2
Academic Qualifications of Teachers under Different
Categories of Management

| Academic Qualifications | Govt. (State) | Govt. (MADC) | Deficit (MADC) | SSA | Private | Total |
|--------------------------------|----------------------|---------------------|-----------------------|------------|----------------|--------------|
| M.A. | - | 5 | 1(20%) | 1(20%) | - | 2(8.70%) |
| B. Sc. | - | - | | | 4 (80%) | (17.39%) |
| B. E. | - | - | 1(20%) | - | - | 1(4.35%) |
| B.A. | 1(20%) | 3(60%) | 2(40%) | 3(100%) | - | 9(39.13%) |
| +2Science, B.A. | 1(20%) | 1(20%) | 1(20%) | - | 1(20%) | 4(17.39%) |
| PUC/+ 2 (Arts) | 3(60%) | - | - | - | - | 3 (13.04%) |
| Total | 5 | 5 | 5 | 3 | 5 | 23 |

The above data shows that the academic qualifications of teachers dealing with science ranges from Pre-University Course (PUC) to Postgraduate

Arts. Sixty per cent teachers of the sampled schools of Govt. (State) were found having qualification of PUC (Arts) only, 20% Bachelor of Arts with + 2 science background and the remaining 20% Bachelor of Arts. With regards to qualifications of teachers under Govt. (MADC) schools, 60% of the teachers were Arts graduates while Arts graduate teachers with + 2 science background and Postgraduates Arts respectively were 20% each. In case of deficit schools, 20% each of the teachers were having the qualifications of Postgraduate Arts, engineering graduate and Arts graduate with + 2 science background. As for SSA managed schools, all the teachers handling the subject were Arts graduates. For private schools, majority of the teachers (80%) were science graduates, while 20% of them were only Arts graduates with + 2 science background. Except private schools, no other school in the sample was found to have science graduates. It is significant to observe that teachers with P.U.C. Arts were also teaching science at the middle school level and that too in schools managed by State Govt. A close observation of the data further reflects that on the whole, 78.26% of non-science post-graduates, graduates and undergraduates were teaching the subject at this stage meaning that majority of the students in the district were taught science not by the right type of teachers. A study by Sarma Dev (2002) also pointed that most of the teachers manning the schools of the North-East Region at different levels do not have science background.

Professional Qualifications of Teachers

In teaching profession, apart from academic qualifications, professional qualification of teachers is very important as it provides the teachers with knowledge, skills and techniques of teaching-learning process for effective delivery of curriculum in class. For many years before Siaha District had a full-fledged District Institute of Education and Training (DIET) in 2014, the teachers had difficulties in undergoing in-service professional training resulting in back-log of teachers. Now with the functioning of DIET in Siaha, this problem could be surmised to have

been solved significantly. However, to ascertain the ground reality, it would be interesting to see the status of the professional qualification of teachers as in Table 3 below.

Table 3
Professional Qualifications of Teachers under
Different Types of Schools

| Type of Schools | Teachers with Professional Qualification | No. of Teachers Interviewed | Total |
|-----------------|--|-----------------------------|-------|
| | D.El.Ed. | - | - |
| Govt. (State) | 5 (100%) | Nil | 5 |
| Govt. (MADC) | 5 (100%) | Nil | 5 |
| Deficit (MADC) | 5 (100%) | Nil | 5 |
| SSA | 3 (100%) | Nil | 3 |
| Private | 1 (20%) | 4 (80%) | 5 |
| Total | 19 (82.61%) | 4 (17.39%) | 23 |

As shown in the above table, majority of the teachers (82.61%) had professional qualification i.e. Diploma in Elementary Education (D.El. Ed). However, the percentage of teachers from the private schools with professional qualification was very low i.e. 20%. This is not a healthy indication. Government, deficit and SSA managed schools were much better than private schools in this regard. The finding of the present study is in tune with the finding of Chuaungo (2014).

Participation of Teachers in Short –term Training

Apart from professional qualification, participation of teachers in short-term training namely orientation programme, refresher course,

workshops etc. is also of paramount importance to help equip them with the necessary pedagogical skills to meet new challenges and to transact the new curriculum in schools effectively which has been changing from time to time. Analysis regarding the participation of teachers in such training for the sampled schools was presented in the following table.

Table 4
Participation of Teachers in Short-term Training

| Not Participated | Between 1 & 5 times | Between 6 & 10 times | 11 & above | Total |
|-------------------------|--------------------------------|---------------------------------|-----------------------|--------------|
| 4 (17.39%) | 13 (56.52%) | 3 (13.04%) | 3 (13.04%) | 19(82.61%) |

The above table reveals that majority of the teachers (82.61%) participated in short-term training and the frequency of which ranges from 1 to more than 11 times. Only 17.39% of the teachers have not participated even a single short-term training and all of them were found belonging to Private schools. Upon query for not being participated in training, all the teachers expressed that school owners/principals are not in favour of it for the fear that classes would be affected during the absence of teachers. The same has been revealed in an interview with the Principal, DIET, Saiha. All the teachers who have participated in such trainings expressed that the training programmes were useful in teaching science, and also opined that more such trainings be organised by DIET.

Lesson Planning in Science Teaching

Lesson planning is essential for successful teaching. It is a classroom guide for the teachers during the course of teaching. It enables the teacher to aim at objectives appropriate to the lessons. It is a necessary pre-requisite for effective teaching of science at the middle school level. Hence, the data relating to this was collected from the teachers and shown as in table 5.

Table 5
Lesson Planning in Science Teaching

| Lesson Planning | Govt. School (State) | Govt. (MADC) | Deficit (MADC) | SSA | Private | Total |
|------------------------|-----------------------------|---------------------|-----------------------|---------------|----------------|--------------|
| Yes | 1(20%) | 1(20%) | 2(40%) | 1 (33.33%) | 3(60%) | 8(34.78%) |
| No | 4(80%) | 4(80%) | 3(60%) | 2(66.67%) | 2(40%) | 15(65.22%) |
| Total | 5 | 5 | 5 | 3 | 5 | 23 |

Above data reflects that on the whole majority of the science teachers (65.22%) were found not preparing lesson plan, while (34.78%) of the teachers prepared lesson plan. However, it is interesting to note that private schools are leading in terms of planning of lesson where 60% of the teachers reported that they regularly plan their lessons. The findings reveal the need to take steps in order to popularize and insist on teachers of all categories for the preparation of lesson plan for effective teaching-learning of science.

Availability of Science Kits

Science kits are very useful to impart knowledge to students. They help students to learn the practical aspect of science in everyday life. Students generally enjoy doing things practically. Although science practical classes or experiments are not made compulsory at the middle school stage unlike the secondary stage, they are expected to have at least some science kits to be used in explaining different science concepts and make the teaching-learning process more exiting. Analysis in this regard was shown in the following table.

Table 6
Availability of Science Kits

| Types of Schools | Science Kits | | Total |
|------------------|--------------|---------------|-------|
| | Available | Not Available | |
| Govt. (State) | - | 5 | 5 |
| Govt. (MADC) | - | 5 | 5 |
| Deficit (MADC) | 1 (4.35%) | 4 | 5 |
| SSA | - | 3 | 3 |
| Private | 2 (8.70%) | 3 | 5 |
| Total | 3 (13.04%) | 20 (86.96%) | 23 |

Out of 23 schools, sadly 20(86.96%) schools did not have any science kits at all, while only 13.04% of the schools (private 8.70% and deficit 4.35%) had science kits and reported that they normally conduct 2 to 3 practical from Physics lesson. Private schools are, thus, once again found taking the lead in conducting science practical, albeit a few in number. It is interesting to mention here that in 40% of the deficit and 20% of the SSA sampled schools, Television sets supplied by District Council were found. In response to a question, science teachers and headmasters expressed that had science kits been supplied instead of Television sets, their usage in teaching science would be more productive.

Method(s) of Teaching Science

There are various methods of teaching of science. The method(s) to be adopted by a teacher, however, depends on various factors such as his talent, interest, experience, ability to arouse interest and gain co-operation of his pupils; and facilities available in the school. Hence,

it remains for the teacher to choose one or more different methods which he thinks will be best suited and most effective for a particular group of pupils in a particular situation. The following table presents the different methods used by the teachers in teaching science.

Table 7
Methods of Science Teaching

| Methods of Teaching | No of Teachers and Percentage |
|--|--------------------------------------|
| Textbook method (reading and explaining) and Question-answer method (note writing on board/note dictating) | 20 (86.96%) |
| Lecture-cum-Demonstration | 3 (13.04%) |
| Total | 23 |

Although there are various methods of teaching science, yet methods such as textbook method (reading and explaining) and question-answer method (note writing on board/ note dictating) were found being used as the dominant methods by teachers of all the sampled schools as shown in Table 7 above. Only 13.04% teachers employed lecture-cum-demonstration. This could probably be due to the fact that majority of the schools do not have any science kits to be used to demonstrate in teaching science. The overall situation, therefore, indicates that science is taught mainly with traditional methods using textbooks and blackboards mostly. Chimara (1999) also reported that the method of classroom dictating markedly dominated across all levels of education in Mizoram. Almost all the science teachers strongly felt the need that schools should have access to some science kits and equipment so that they can demonstrate something to their students about what science really is. Hence, providing of at least some science kits to the middle schools by the concerned authorities is called for to enrich teaching-learning of science.

Medium of Instruction

Before the introduction of English as the medium of instruction in 1999 by the MADC, the medium of instruction at middle stage was in vernacular language mainly Mara language, a language that majority of the people of Siaha district speak. Switching over of medium of instruction from vernacular to English medium received mixed response from all stakeholders – teachers, students and parents. While some welcomed, majority of the people did not welcome the decision taking into account the standard of teachers as well as students. Both the teachers and students of primary and middle schools have been facing problems and more intense in interior and remote villages of the district. Although English had been introduced as medium of instruction about 17 years ago, it is learnt that vernacular is still largely used by the teachers in teaching school subjects. Data on the language used by teachers for teaching/explaining was analysed in the following table.

Table 8
Language used for Teaching/Explaining

| Vernacular | English and Vernacular | English |
|-------------------|-------------------------------|----------------|
| 16 (69.57%) | 4 (17.39%) | 3 (13.04%) |

The data presented in Table 8 depicted that 69.57% of the teachers were using vernacular language (Mizo/Mara), 17.39% of the teachers used English and vernacular language and the remaining 13.04% used English only for teaching/ explaining. Further, when asked whether they are comfortable with English in teaching science, majority of the teachers except a few in private schools, reported that they are uncomfortable with English in teaching science and also added that students understand better and respond well when taught in vernacular language. Majority of the teachers, therefore, suggested that medium of instruction up to class VIII should be in vernacular language (Mizo/Mara).

SUGGESTIONS FOR IMPROVEMENT OF THE STATUS OF SCIENCE TEACHING IN THE MIDDLE SCHOOLS IN SIAHA DISTRICT

Based on the findings of the study, the following measures have been suggested for the improvement of the status of science teaching in Siaha district:

1. The School Education Department of State Government as well as the District Council should have clear recruitment rules for middle school science teachers. The idea that any graduate can teach science up to Class -VIII is a wrong perception. The authorities should not remain indifferent towards science education at the lower level. In fact, this is the stage where government should give more importance to science education. Only on firm foundation of school education can qualitative improvement be attempted. The minimum qualifications laid down by NCTE in August, 2010 for appointment as teacher in middle school should be strictly followed.
2. The study revealed that 69.57% of Arts undergraduates and graduates are teaching science. This is indeed a serious limitation. Government should take appropriate steps to appoint qualified science teachers otherwise science teaching at this stage will remain only as ritual.
3. Although majority of the private school teachers (80%) were science graduates, they were without professional qualification. Therefore, they should be encouraged to undergo in-service professional training by the school owners/principals because professional efficiency of teachers is important for effective teaching-learning process.
4. Majority of the private school science teachers (80%) did not attend short-term training mainly because they were not encouraged by the school owners/principals for the fear the classes would be affected

in absence of teachers. Intervention of District Council in this regard is important. District Council should make the participation of private school science teachers in short-term training mandatory. Further, majority of the teachers (82.61%) who had already attended short-term training, suggested that more such training namely refresher courses should be organized by DIET from time to time to update and equip them with the necessary pedagogical skills for effective delivery of the curriculum.

5. Majority of the science teachers (65.22%) under different categories of management with exception of a few private schools, in spite of having professional qualification, were not employing lesson plan. Hence, regular preparation of lesson plan should be encouraged and ensured.
6. Although science practical classes or experiments are not made compulsory at the middle school stage, unlike the secondary stage, efforts should be made by the State Government and District Council to provide at least some science kits so that teachers can demonstrate something to their students and thus make teaching-learning creative and effective. At the same time as majority of the teachers are from Arts stream, short term training as to how to handle the science kits may be given. Setting up of science laboratories, however small they may be should be given importance. Alternatively, the online resources could also be deployed extensively wherever and whenever possible not only to arouse the intellectual curiosity in the students but also to describe scientific concepts.
7. As suggested by majority of the teachers, the medium of instruction should be vernacular (Mizo/Mara) wherever applicable.

CONCLUSION

The findings of the study clearly depict the poor status of science teaching in this part of the state. In majority of the schools, science is manned by Arts graduates using mostly traditional method of teaching. Moreover, science kits are not found in almost all the schools. In this regard, the State Government and the District Council may come out with clear recruitment rules for appointment of qualified science teachers and also take measures for providing science kits for the improvement of the status of science teaching in the middle schools not only in Siaha district but also in the entire state. Inadequate and weak foundations of science in the educational system at the primary level hamper the development of science education in the district. The science education imparted in the schools is not in conformity with the times and it still has miles to go. The status of science teaching in the district needs to be raised by way of providing the right kind of teachers and adequate infrastructural facilities.

REFERENCES

- Chimara, B. (1999) Education in Mizoram: Development perspective and future challenges. *Journal of North Eastern Council* 19, 4, 8–10, October-December.
- Chuaungo, L. (2014) School education in Mizoram: An analytical study. *Journal of All India Association for Educational Research* 26, 2, 48 - 82, December.
- Ghosh, P.N. (2006) The school science education. *Everyman's Science* 41, 2, 83- 85, June – July.
- Jain, M.(2004) Teaching of science at the elementary stage: Observations from a qualitative study. *Journal of Indian Education* 29, 2, 7 – 22, August.
- Kishore, L. (1992) Science experiences for pupils. *The Primary Teacher* 17, 1, 7–8.
- Kishore, L. and Agarwal, B.K. (1991) Play-way science activities for lower primary students. *The Primary Teacher* 16, 10, 7 – 8.
- Kothari, D.S. (1966) (Chairman) *Report of the Education Commission 1964-66*. Govt. of India, New Delhi.

- Lorrain, R.A. (1988) *Five Years in Unknown Jungles for God and Empire*. Spectrum Publications and Tribal Research Institute, Aizawl.
- Mudaliar, A.L. (1953) (Chairman) *Report of the Secondary Education Commission 1952 – 53*. Govt. of India, Delhi.
- Sarabhai, B. (1974) *Science Policy and National Development*. McMillan Company of India, Delhi.
- Sarma Dev, B. K. (2002) Mathematics an ailing subject. *Eastern Panorama News Magazine of North East* 11, 2, 8-11, December.
- Siddiqi, N. (1995) Activity-oriented process-based science teaching. *School Science* 23, 40-47.
- Singh, T.B. (2004) A study of existing facilities of science teaching in the high schools of Chhimtuipui district, *Mizoram Journal of Indian Education* 32, 3, 117 – 124, November.
- Venville, G. and Dawson, V. (Eds.) (2004) *The Art of Teaching Science*. Allen and Unwin, Sydney.

AUTHOR

Dr. Thockchom Budha Singh, Asso. Prof., Govt. Saiha College, SAIHA- 796
901 Mizoram
E-mail: singhbudha82gmail.com

ASSESSMENT OF IMPACT OF RIGHT TO EDUCATION (RTE) ACT 2009 IN HARIDWAR DISTRICT

Anamika Chauhan

The Govt. of India is already doing a lot by enacting, amending and incorporating new clauses to the existing Right to Education Act 2009. The more recently, by substitution of a new section for Clause 16 of the Right of Children to free and compulsory Education (Amendment) Act, 2019. The second amendment to the RTE did away with the no-detention policy in Standard V, giving the states flexibility to detain students, if they did not pass the relevant examinations. Despite the progress and improvement in the statistics in Enrolment, Retention, Infrastructure and Accessibility, which can be termed as some of the success that the RTE Act has achieved, the quality of education in the country is still not at par with the expected standards of quality education. No doubt learning outcomes at every level significantly increases, but no significant research so far conducted to know which factors have contributed to it: Parents, home study, environment, private tuition or the formal education at School. If, formal education is the case, then why it was so not happening, with disadvantages groups, where access to education is minimal. An effort was made by the author to find out impact of Right to Education (RTE) Act 2009 in Haridwar District.

INTRODUCTION

Education is increasingly being viewed as a fundamental right across the world and essential for exercise of all other human rights. It is seen as a basic foundation of modern society, enabling social enrichment and economic growth and prosperity. It leads to individual freedom and empowerment. In an article published in Times of India on January 1, 2019, Raghuram Rajan(former Governor RBI) and Abhijit Banerjee (Nobel laureate) lay out eight things that India needs to do in 2019.

For education, they say “The Right to Education Act focuses on input requirements for schools that have little bearing on learning outcomes, which have deteriorated alarmingly. Learning must be our central focus, with all schools, public and private, responsible for delivering a minimum level of basic skills to every child”.

RIGHT TO EDUCATION (RTE)

The Constitution (Eighty-sixth Amendment) Act, 2002 inserted Article 21-A in the Constitution of India to provide free and compulsory education of all children in the age group of six to fourteen years as a Fundamental Right, in such a manner as the State may, by law, determine. The Act represents the consequential legislation envisaged under the Article, means that every child has a right to full time elementary education of satisfactory and equitable quality in a formal school which satisfies certain essential norms and standards.

Article 21-A and the RTE Act came into effect on 1 April 2010. The title of the Act incorporates the words ‘free and compulsory’. ‘Free education’ means that no child, other than a child who has been admitted by his or her parents to a school which is not supported by the appropriate Government, shall be liable to pay any kind of fee or charges or expenses which may prevent him or her from pursuing and completing elementary education. ‘Compulsory education’ casts an obligation on the appropriate Government and local authorities to provide and ensure admission, attendance and completion of elementary education by all children in the 6-14 age groups. With this, India has moved forward to a rights based framework that casts a legal obligation on the Central and State Governments to implement this fundamental child right as enshrined in the Constitution, in accordance with the provisions of the Act.

The RTE Act provides for the:

- Right of children to free and compulsory education till completion of elementary education in a neighbourhood school.

- It clarifies that ‘compulsory education’ means obligation of the appropriate government to provide free elementary education and ensure compulsory admission, attendance and completion of elementary education to every child in the six to fourteen age group. ‘Free’ means that no child shall be liable to pay any kind of fee or charges or expenses which may prevent him or her from pursuing and completing elementary education.
- It makes provisions for a non-admitted child to be admitted to an age appropriate class.
- It specifies the duties and responsibilities of appropriate Governments, local authority and parents in providing free and compulsory education, and sharing of financial and other responsibilities between the Central and State Governments.
- It lays down the norms and standards relating inter alia to Pupil Teacher Ratios (PTRs), buildings and infrastructure, school-working days, teacher-working hours.
- It provides for rational deployment of teachers by ensuring that the specified pupil teacher ratio is maintained for each school, rather than just as an average for the State or District or Block, thus ensuring that there is no urban-rural imbalance in teacher postings. It also provides for prohibition of deployment of teachers for non-educational work, other than decennial census, elections to local authority, state legislatures and parliament, and disaster relief.
- It provides for appointment of appropriately trained teachers, i.e. teachers with the requisite entry and academic qualifications.
- It prohibits (a) physical punishment and mental harassment; (b) screening procedures for admission of children; (c) capitation fee; (d) private tuition by teachers and (e) running of schools without recognition,

- It provides for development of curriculum in consonance with the values enshrined in the Constitution, and which would ensure the all-round development of the child, building on the child's knowledge, potentiality and talent and making the child free of fear, trauma and anxiety through a system of child friendly and child centred learning. (source: <https://mhrd.gov.in/rte>).

STATUS OF SCHOOL EDUCATION IN HARIDWAR DISTRICT

Haridwar, one of the 12th district of the Utrarakhand State, is one of the major pilgrim town of the country. The district has 6 blocks, 54 Clusters, and 675 villages with 1948 schools. Overall literacy rate is 74.6, with male literacy rate of 82.3 and Female Literacy Rate of 66.0 as per Census, 2011. The district has a total of 1948 schools with enrolment of 338,213 with total teachers of 9827. Performance Indicators of the school education of the district are : Single Classroom Schools (0.7), Single-teacher Schools (7.6), Schools approachable by all weather road (94.5), Playground facility (69.7), Boundary wall(90.6), Girl's Toilet (96.4), Boy's Toilet (99.8), Drinking water facility (98.1), Electricity (88.7), Computer facility(42.0), Ramp (18.6), with Kitchen-shed (82.20) and School with SMC (95.9). The other Indicators are Pupil-teacher ratio (34), Student-Classroom ratio (29), average teachers per school (5.1). The District has 55.3 percentages of female teachers with Girls enrolment of 47.0 percentages. Repetition rate in Grade I is (0.60), II (0.57), III (0.57), IV (0.35), V (0.49), VI (0.58), VII (0.62), VIII (0.64). whereas drop-out rate of percentage of Grade I is (13.94), II (5.22), III (6.10), IV (5.69), V (15.07), VI (2.96), VII (1.70), VIII (20.71). Both the above considered as major indicators of the Universalization of Education and so also the Right to Education.

ASSESSMENT OF IMPACT OF RTE

The ability to read and write, and perform basic operations with numbers, is a necessary foundation and an indispensable prerequisite for all future schooling and lifelong learning. Through initiatives such as the Sarva

Shiksha Abhiyan (now the Samagra Shiksha) and the Right to Education Act, India has made remarkable strides in recent years in attaining near-universal enrolment in elementary education. The impact of the RTE Act can be understood from the fact that India was reported to have the largest number of illiterate adults in the world, at 37 per cent of the global total in the year 2014. This shows the disparity that still exists with regards to the access to education in the nation, pointing to the fact that the provisions of the Education Act have failed to target those in the society who need it the most. According to UNESCO's 11th Education for All (EFA) Global Monitoring Report 2013-14, the poorest young women in India are projected to achieve universal literacy only by 2080, whereas the richest young women in the nation have already achieved it.

Though there has been an increase in the enrolment rates in schools, quality of learning is diminishing. Various reports and studies reveal that, there is a decline trend in learning outcomes since the enactment of RTE Act. This is also been proved by The Annual Status of Education Report (ASER) 2014, by Pratham, clearly spells out that learning outcomes in reading, writing and arithmetic in state-run schools is poor. The recent ASER, 2018 also clearly spells, Learning levels gradually improving since 2016, about half of all children can read, and less than a third can do basic arithmetic. Basic mathematics levels also remain low. At VIII Standard, more than half of all children are still struggling with division, 1 out of 4 children leaving Std VIII without basic reading skills. The trend in Uttarakhand is alarming, since it shows a decline trend of (-4.9%) in case of children in Govt schools in Std III who can at least do subtraction :(ASER 2018). Considering the above, it is the time to divert our attention from enrolment rates, infrastructure etc. to learning outcomes to ensure the young generation get access to quality education.

The primary purpose of assessment of RTE will indeed be for learning. It will help the teacher and student, and the entire schooling system,

continuously revise teaching-learning processes to optimize learning and development for all students. With this background the researcher besides status survey of RTE, make an attempt to assess the impact of RTE through the attitude of principals, teachers and SMCs at the micro level in the District of Haridwar.

The assessment of Impact of RTE Act 2009 was studied through the indicators of contribution made by the School Management Committees (SMC), perception of the SMC about the core indicators of RTE like Enrolment, Retention, Infrastructure, Accessibility and quality of Education and perception of teachers and principals about the contribution made by the SMC on improving child's physical and mental capability, helping in child counting & pulse polio, arranging mid-day meal, bringing dropout to main stream, school boundary wall, motivating children to come to school, motivating girls education, sincerity towards school, arranging water facility, help on special occasion, building another room, helping financially, hops in financially, stress on moral education, ditch filling, construction work.

OBJECTIVES

Objective of this impact assessment study was to provide reliable, current, and actionable evidence relating to Enrolment, Retention, Infrastructure, Accessibility and quality of Education, and perception of teachers and principals about the contribution made by the School Management Committee at macro level. Further, objectives of the study were to assess the implementation of RTE Act in the elementary schools of the Haridwar District of Uttarakhand State and to examine the achievements of Right to Education in terms of enrolment, retention, drop-out and learning achievement.

SAMPLING AND COVERAGE

Present study covers rural as well as urban blocks/clusters of districts of Haridwar. In each cluster, one school was included covering all the

six blocks of the Districts using the Probability Proportional to Size (PPS) Method. Within each school, 20 students from any one section of the class were selected through random sampling. Parents, principals, teachers and members of the SMCs were also selected through purposive random sampling method.

Background information on parents, households, and village characteristics were also collected. Survey was done through questionnaire to collect information about school characteristics such as infrastructure, student attendance, School Management Committee (SMC) and finances.

TOOLS AND TESTING

Questionnaires were constructed, developed, validated to assess basic information, opinion, perception, attitude of teachers, principals, students, School Management Committees. Many of the items were borrowed from National Achievement Survey, ASER and other standardized questionnaire already successfully uses at national level for assessment, survey, impact study of Right to Education Act 2009. The investigator visited all the sample schools, and collected information through the tools from students, teachers, principals, parents, members of the SMCs, and physically verified the infrastructure like playground, boundary wall, electricity, drinking water, toilets, kitchen and others in the school.

ASSESSMENT OF IMPACT: DATA, ANALYSIS AND INTERPRETATION

Based on the data collected by the researcher descriptive statistics were used to find out the results for the analysis and interpretation. To elaborate in details, statistical results of the study were presented through following tables.

Table 1
Comparison with National Status; Status survey
(Data in percentages)

| Sl No | Indicators of Assessment: Infrastructure | FY2009-10 | FY 2013-14 | Position in the sampled school in FY2019-20 |
|--------------|---|------------------|-------------------|--|
| 1 | Single-teacher Schools | National Status | National Status | 1.0 |
| 2 | Playground facility | 9 | 8 | 59.4 |
| 3 | Boundary wall | 51 | 58 | 88.0 |
| 4 | Girl's Toilet | 51 | 62 | 97.4 |
| 5 | Drinking water facility | 59 | 85 | 84.0 |
| 6 | Computer facility | 93 | 95 | 56.0 |
| 7 | Ramp | 15.8 | 19.6 | 83.0 |
| 8 | Kitchen with shed | 47 | 82 | 79.0 |
| 9 | School with SMC | 43 | 75 | 100.0 |
| 10 | Student Class room Ratio | - | 95 | 32 |

On the basis of analysis of data it can be concluded that though the District has achieved a lot in areas like social infrastructure i.e. girl's toilet, boundary wall, ramp, kitchen with shed but a lot to be done with providing computer facility, playground facility specially keeping in view the slogan of Khelo India. There are many aspects which need for assessment like separate girls toilet, toilet locked or not, toilet usable or

not, toilet with water facility or not. The same to be studied in detailed in other indicators also. Though, it is a fact that after RTE implementation, enough infrastructures, and mass enrolments increases in the schools, but the quality indicators and sustainability depends on the involvement of SMCs, perception and attitude of principals and teachers.

Table 2
Comparison with National Status; Status survey
(Data in percentages)

| Sl No | Other Indicators of Assessment | Position in the sampled school in FY2019-20 |
|--------------|--|--|
| 1 | Single Classroom Schools | 0.0 |
| 2 | Average Teachers Per School | 4.6 |
| 3 | Pupil Teacher Ratio | 39 |
| 4 | Girls Ratio with Boys | 42 |
| 5 | Female Teachers | 76.0 |
| 6 | Schools approachable by all weather road | 98.2 |
| 7 | Boy's Toilet | 97.7 |
| 8 | Electricity | 96.0 |

Table 3
Comparison with National Status; Status survey
(Data in percentages)

| S I No | Other Indicators of Assessment | Position in the sampled school in FY2019-20 |
|---------------|---------------------------------------|--|
| 1 | Repetition rate in same class | 0.7 |
| 2 | Dropout rate Grade V | 4 |

From the analysis of data on repetition rate in same class and Dropout rates, a significant improvement has made after implementation of RTE in the District. Though, there are some instances of repetition in same class and dropout rate none of the cases causes due to schools. Objectives of RTE i.e. no child admitted in any school shall be held back in any class or expelled from school till the completion of elementary school has been strictly adhered

Table 4
Comparison with National Status; Status survey
(Data in percentages)

| SI NO | Contribution | Principal (54) | Teachers (108) | Parents (162) |
|-------|----------------------------------|----------------|----------------|---------------|
| 1 | Mid-day Meal | 32 | 40 | 62 |
| 2 | Personal Hygiene of the Children | 29 | 36 | 65 |
| 3 | Construction of the School | 42 | 40 | 90 |
| 4 | Appointment of the Teacher | 12 | 15 | 63 |

An effort was made to assess the contribution made by School Management Committees on other indicators of the RTE like mid-day-meal, personal hygiene of the children, construction (repairing) of the school and appointment of teacher. Effort of assessment was done through the perception/ attitude of principals, teachers and parents. From the results it can be concluded that there was unanimity on the role of SMCs on above indicators, through range of perception varies at large. However there is much similarity of perception between Principals and Teachers.

Table 5
Contribution made by SMC in Right to Education: perception of
Principal, Teachers, Parents and Members of the SMCs
(Data in percentages)

| Sl No | Contribution | Principal (N=54) | Teachers (N=108) | Parents (N=162) | SMCs (N=108) |
|--------------|--|-------------------------|-------------------------|------------------------|---------------------|
| 1 | Improving child's physical & Mental Capability | 25 | 25 | 10 | 80 |
| 2 | Helping in Child counting & Pulse Polio | 31 | 35 | 20 | 75 |
| 3 | Arranging Mid-Day Meal | 35 | 36 | 70 | 90 |
| 4 | Bringing Dropout to Main Stream | 22 | 25 | 60 | 90 |
| 5 | School Boundary Wall | 32 | 40 | 75 | 80 |
| 6 | Motivating Children to come to School | 33 | 35 | 60 | 72 |
| 7 | Motivating Girls Education | 27 | 35 | 60 | 92 |
| 8 | Arranging Water Facility | 36 | 40 | 45 | 75 |
| 9 | Help on Special Occasion | 20 | 25 | 36 | 52 |
| 10 | Building another Room | 37 | 45 | 68 | 87 |

| | | | | | |
|----|---------------------------|----|----|----|----|
| 11 | Helping Financially | 32 | 35 | 40 | 75 |
| 12 | Stress on Moral Education | 32 | 47 | 52 | 66 |
| 13 | Construction Work | 42 | 58 | 80 | 95 |

An effort was made to assess the contribution made by SMCs on other indicators of the RTE like improving child's physical and mental capability, helping in child counting and pulse polio, arranging mid-day meal, bringing dropout to main stream, school boundary wall, motivating children to come to school, motivating girls education, arranging water facility, help on special occasion, building another room, helping financially and stress on moral education. Effort of assessment was done through the perception / attitude of Principals, Teachers, Parents and members of the SMCs. From the results it can be concluded that there is unanimity on the role of SMCs on above indicators, through range of perception varies at large. However there is much similarity of perception between Principals and Teachers on contribution made by SMCs, though it was on lower side.

Table 6
Learning Outcomes of Grade V, VII and VIII of the sampled School
(N=54 cluster schools x 20 students) (Data in percentages)

| Sl No | Learning Outcomes | Class V | Class VII | Class VIII |
|-------|---|---------|-----------|------------|
| 1 | Not able to do division | 82 | 65 | 52 |
| 2 | Not able to read Class 3 Hindi books fluently | 57 | 24 | 17 |
| 3 | Could not do two digit subtractions | 66 | 52 | 44 |

| | | | | |
|---|--|----|----|----|
| 4 | Could not able to write the school Name | 26 | 10 | 6 |
| 5 | Not able to identify President of Union of India | 82 | 66 | 55 |
| 6 | Not able to write the name of the Capital of the State | 77 | 53 | 26 |

The quality of learning outcomes has been a major challenge in implementation of the RTE Act. All the impact assessment studies done so far like Pratham's ASER Report, National Achievement Survey (NAS) of NCERT, Confederation of Indian Industry (CII) and other institutions and researchers found that learning outcome is the most vulnerable gray area of RTE, which need to be addressed emergently. Though the country is about to achieve the target of enrolments, retention, dropout rates, we need to focus on learning outcomes. Many of the teachers are of the opinion that the policy of no retention in same class and no child admitted in any school shall be held back in any class or expelled from school till the completion of elementary school are some of the prominent reasons for low learning outcomes. Most recent World Development Report, The (World Bank 2018) highlights that learning outcomes will not change unless learning is used as a guide and metric.

CONCLUSION

One of the primary goals of the schooling system must be to ensure that children are enrolled in and are attending school. The Right to Education has made remarkable achievement in recent years in attaining near universal enrolment. The New Education Policy has also appreciated the efforts made by RTE towards universal enrolment. Despite the progress and improvement in the statistics in four broad areas of Enrolment, Retention, Infrastructure, and Accessibility, which

can be termed as some of the success that the RTE Act has achieved, the quality of education in the country is still not at par with the expected standards of quality education. No doubt learning outcomes at every level significantly increases, but no significant research so far who have contributed it: Parents, homestudy, environment, private tuition or the formal education at School. If, formal education is the case, then why it was so not happening, with disadvantaged groups, where access to education is minimal. Everybody is aware of a new profession “tutor” and coaching industry. Even in backward rural village though it is not in organized manner, tutor and coaching centres are emerging but private tuition system is there. At the time of discussion and interview with parents and students it was observed that almost 98 percent students of class V and Class VIII, those who have access and able are studying in private tuition. If, progress in learning outcomes are the result of all other factors except schooling, then the policy of Govt need to be revisited. Further, we can’t blame always on teachers, principals, SMCs and above all school for low learning outcomes unless they don’t have any control over, admission, orientation, human resources, appointment of qualified personnel, involvement of various stakeholders, utilisation of teaching time other than teaching an stopping automatic promotion.

The Govt of India is already doing a lot by enacting, amending and incorporating new clauses to the existing Right to Education Act 2009. The more recently by substitution of new section for Section 16 of the Right of Children to free and compulsory Education (Amendment) Act, 2019. The second amendment to the RTE did away with the no-detention policy in Std. V and Std. VIII, giving states flexibility to detain students if they did not pass the relevant examinations. In 2017, an amendment to the RTE required all states, to prepare “class-wise, subject-wise learning outcomes for all elementary classes” and to also devise “guidelines for putting into practice continuous and comprehensive evaluation, to achieve the defined learning outcomes.” Hopefully, RTE 2.0 (Second

amendment) results seriousness towards learning and accountability to meet the minimum benchmarks.

REFERENCES

- Chauhan, A. (2019) *A Study of Right to Education in the District of Haridwar*. Unpublished Progress report.
- HNBGU, Srinagar. Confederation of Indian Industry(2016) *Assessing the Impact of Right to Education*. Author; New Delhi.
- MHRD (2009) Right of Children to Free and Compulsory Education Act 2009 (*The Gazette of India Extraordinary Part II-Section I No. 39, August 27*. Govt. of India, New Delhi. Retrieved from http://mhrd.gov.in/sites/upload_files/mhrd/files/rte.pdf
- MHRD (2014) *Education for All: Towards Quality with Equity*. Govt of India, New Delhi.
- MHRD (2019) *Right of Children to Free and Compulsory Education (Amendment) Act 2019 (The Gazette of India Extraordinary Part II-Section I No. 1, January 11*. Govt of India, New Delhi. Retrieved from https://mhrd.gov.in/sites/upload_files/mhrd/files/upload_document/rte_2019.pdf.
- NCERT (2017) *National Achievement Survey (NAS) 2017*. Author, New Delhi
- NUEPA (2014) *Elementary Education in India: Progress towards UEE, U-DISE Flash Statistics Report 2013-14*. Author, New Delhi.
- Pratham Foundation (2014) *Annual Status of Education Report 2014*. Author, New Delhi.
- Pratham Foundation (2018) *Annual Status of Education Report 2018*. Author, New Delhi.
- Pratham Foundation (2019) *Annual Status of Education Report 2019*. Author, New Delhi.
- UNESCO (2014) *Global Monitoring Report*. Author, Paris.
- United Nations (2015) *The Millennium Development Goals Report*. Author, New York. Retrieved from https://www.un.org/millenniumgoals/2015_MDG_Report.
- Vagh, S.B. (2016) Is Simple, Quick and Cost-Effective Also Valid? Evaluating the ASER Hindi Reading Assessment in India. In UNESCO Institute for Statistics, *Understanding What Works in Oral Reading Assessments*

(pp. 202-212).UIS, Montreal.

World Bank (2013) *Global Monitoring Report 2013: Rural-Urban Dynamics and Millennium Development Goals*. Author, Washington, DC. Retrieved from <https://www.worldbank.org/en/publication/global-monitoring-report>.

World Bank (2018) *World Development Report 2018: Learning to Realize Education's Promise*. Author, Washington, DC. Retrieve from <https://www.worldbank.org/en/publication/wdr2018>.

AUTHOR

Ms. Anamika Chauhan, Research Scholar, HNBG Central University, Srinagar, Dt. Garhwal, Uttarakhand

TEACHER EFFECTIVENESS OF PRIMARY SCHOOL TEACHERS IN MAURITIUS

**Sharone Ramasawmy
Vimala Veeraraghavan
Ananda Padhan**

Teachers play a key role in the education system because they are the one who convert educational policy decisions into actions. The job of the teacher does not reside solely on one-way transmission of bookish knowledge but they are appointed with the task of triggering the holistic development of the future generation of the country. Since the whole process of educating our children lies on the shoulders of our teachers, it is imperative to understand the factors which when coupled together gives rise to teacher effectiveness. The study focuses upon finding the level of teacher effectiveness of primary school teachers in Mauritius in relation to certain key variables. The findings of the study reveal that Mauritian primary school teachers display a high level of teacher effectiveness, and the effectiveness is irrespective of any gender influence. The personality, motivation and co-curricular activities have emerged as being the high ranked factors to bring out teacher effectiveness.

INTRODUCTION

The education system in Mauritius has undergone many changes starting with the 'Education for All' – a struggle that began in the 1930s and 1940s. The constitutional reforms in 1948, helped in a firm commitment to education with an increase in budget allocation for education and school enrolment. The goal of the Ministry of Education and Human Resource, Tertiary Education and Scientific Research of the Republic of Mauritius

is to transform Mauritius into an educated island by propelling it in the frontline of global progress and innovation. However, the instrument par excellence for the manifestation of such a goal resides on the shoulders of our teachers. Teachers play a key role in the education system because they are the one who convert educational policy decisions into actions. Moreover, today's education system does not consider our children as being passive learners but rather see them as active ones. This means that the job of the teacher does not reside solely on one-way transmission of bookish knowledge but they are appointed with the task of triggering the holistic development of the future generation of the country.

Teaching is a complex task requiring a hybrid of factors such as passion, up to date materials, personalised feedback designed to help the professional development of the teachers and serious practice. When such kind of teaching takes place by a teacher then we say that the teaching delivered by the teacher has become effective. In order to imbibe students with the necessary qualities, the teacher needs to be philosophically, sociologically and psychologically sound (Toor 2014). The quality of teachers determines the quality of education. A school may have the best resources- infrastructure, equipment, libraries and up to date curriculum but if the teachers do not have the necessary qualities and are not aware of their responsibilities, then the whole materials resources will go to waste (Kareem & Ravivot 2014). It has become important to understand what constitutes an effective teacher since it is evident that effective teaching does not occur by chance. The present study explores the level of primary school teacher effectiveness in Mauritius, identifies the most effective dimensions of teacher effectiveness and the gender influence on teacher effectiveness.

Teacher Effectiveness and Associated Factors

Teacher effectiveness has been conceptualised by researchers in numerous ways in their studies. Sammons and Mortimore (1997)

highlighted that there is much debate on the term effectiveness due to its perceived relationship with professional competency. Kumar and Kumar (2015) presented teacher effectiveness in terms of five dimensions: (a) personal factors (b) professional factors (c) intellectual factors (d) teaching strategies (e) social aspect. Alao (2013) also claimed that the work of a teacher goes beyond the threshold of the classroom since recent studies have stated that teachers spend (a) less than half of their time at work on classroom instruction, (b) more time on administrative work like marking, preparing notes, development of the curriculum, general meetings, network with parents, school inspectors and head of schools. The researcher proposed that today's education system should not limit the teachers' role with only cognitive activities but should incorporate (a) management of the school, (b) managing people and relationship, (c) handling of welfare matters. According to Evans (2006) the personality of a teacher, the interactions that they have with pupils and the impact of their teaching of their behavior is what constitute an effective teacher.

Ko and Sammons (2013) suggest that effective teachers are well versed in the curriculum content, have good teaching strategies, able to communicate effectively with students on what is expected out of them, clear about their instructional goals, are well informed about their students and can adapt their teaching skills according to their needs, track student progress by providing frequent feedback and finally accept responsibility for student outcomes. Hence, we may say that teacher effectiveness is defined in terms of teachers who have attained the optimum level of efficiency and productivity in their roles and functions, such as the preparation and planning for teaching, classroom management, and knowledge of subject matter, teacher characteristics and their interpersonal relations.

Factors Contributing to Teacher Effectiveness

Attempts to define the concept of teacher effectiveness have shown that several combinations of factors are mentioned as contributing towards what constitute being an effective teacher. Basow (2000) talked on essential traits of teachers in terms of being knowledgeable, ready to help and caring. In addition to the mentioned qualities, Ansari and Ansari (2000) have proposed teacher effectiveness as being a multi dimension phenomena which involves several characteristics of the teacher such as the transmission of information, meaningful interaction, formation, feedback and fair treatment. The study by Oyekan (2000) supports the mentioned facts by revealing that the effectiveness in teaching is based on the following practices: appropriate language and communication skills, clarity on conveying the objective, mastering the subject matter and a well organized learning environment. Classroom management was another important aspect of teacher effectiveness proposed by Els Heijnen-Maathuis (2003) since this will help prevent behavior issues among students. Classroom management involves interaction with pupils, motivating students to perform at their best, organizing and managing classroom activities. Harrison and Douglas (2004) highlighted the following indicators for teacher effectiveness: good communication skills, academic competence, professional maturity, clarity in delivery of the subject and organisational skills. Check (2006) added sense of humor and proper grooming coupled with good communication skills in teaching, availability for extra help, extensive use of examples as vital traits. Gupta and Jain (2007) claimed that the characteristics which were correlated with teacher effectiveness consisted of sound knowledge of the subject matter, communication skills in delivery of the content, dealing with classroom situations and ability to organize learning materials. Smith and Cranton (1992) also proposed a checklist of what constitutes a good teacher by including factors such as being a motivator, good organization skills, clarity, stimulate active learning and adapts to individual differences.

A study on the teaching effectiveness of pre-vocational subject teachers in Nigeria revealed that there was no significant gender difference in the level of teaching effectiveness (Kiadese 2011). Malik and Sharma (2013) found that gender and locality do not bear any relationship with teachers' teaching effectiveness. A study by Chowdhury (2014) revealed that the majority of both male and female teachers had an average level of teaching effectiveness. Moreover, no significant difference was found in the level of effectiveness of the teachers in relation to their qualification, years of experience, age and gender.

The level of teacher effectiveness is not significantly affected by sex, nature of school, location of the school, marital status and age (Kumar & Kumar 2015). A study by Dash and Barman (2016) reported that there was no significant differences in the teacher effectiveness with regard to their gender, training status and qualification. There was no significant mean difference found between teachers working in urban or rural region based on types of school and sex in relation to the level of teacher effectiveness (Naik & Mani 2018).

In the present study, teaching effectiveness is treated as a composite of six areas: academic (information source, motivator, teaching skills), professional (co-curricular activities, professional knowledge, classroom management), social (relationship with pupils, fellow teachers, principals and parents), emotional (adviser and guide), moral (disciplinarian) and personality (personality characteristics).

OBJECTIVES OF THE STUDY

The study was conducted with following objectives:

1. The School Education Department of State Government as well as the District Council should have clear recruitment rules for middle school science teachers. The idea that any graduate can teach science

up to Class -VIII is a wrong perception. The authorities should not remain indifferent towards science education at the lower level

1. To find out the level of teacher effectiveness amongst the primary school teachers.
2. To identify the most teacher effectiveness dimension – the higher and the lower ones.
3. To find out whether gender plays any role in bringing out teacher effectiveness.

Hypotheses

The following hypotheses were formulated in the study:

1. There will be a high level of teacher effectiveness amongst primary school teachers.
2. Teacher effectiveness will have some dimensions which will count higher than others.
3. There will be a significant difference in the Mauritian male and female teachers with regard to teacher effectiveness.

Sample

The primary school teachers working in the Government Schools and Roman Catholic Education Authority schools in Mauritius were considered as the population of study. All these schools have the same entry requirements, employ full-time teachers having completed the Teachers Diploma for primary school at the Mauritius Institute of Education, governed by the same salary structure and increments and follow the same academic syllabus for from grade I to grade VI. The teachers were not restricted to geographical limits, age, gender and socio-economic status. A sample of 517 teachers were considered in the study selected through stratified random sampling from whom the data were collected.

Tool Used

The researcher used the Teacher Effectiveness Scale developed by Pramod Kumar and D.N. Mutha(1985) for the present study. Before embarking on the final data collection, a pilot study was conducted to find out if the instruments selected, which are all standardized in Indian conditions, were suitable and applicable to Mauritius teacher population. Taking a sample of teachers (N=50)from different schools, the researcher administered the instrument to them and found that all of them were able to respond to all the items present in the scale. After making sure that the test was appropriate and there was no need to change any item, the researcher took up the final data collection.

ANALYSIS AND INTERPRETATION

Level of Teacher effectiveness in Mauritian Teachers

The scores in teacher effectiveness scale reflect how effective the teachers are in their classroom teaching. The total possible scores and the normative data of the teacher effectiveness (TE scores) for males and females are given in the table below.

As can be seen in Table 1 the teacher effectiveness (TE) scores range from a very low of 250.00 to very high of 329.91. Average effectiveness scores is between 285.72 to 295.39. All scores above this average indicates that the teacher is effective in teaching and that he or she is more effective than average, whereas scores above 312.91 indicates that the teacher is very effective in teaching. Table 1 presents the Mean teacher effectiveness score, the Median and the Standard Deviation of the study.

Table 1
Normative Data for Teacher Effectiveness Scale:
Male and Female Teachers

| Percentile | Male (N=300) Values from Normative Data | Female (N=100) Values from Normative Data | Effectiveness Categories of the Normative Data |
|-------------------|--|--|---|
| P90 | 326.91 | 329.91 | Most Effective |
| P80 | 313.21 | 315.81 | |
| P75 | 311.81 | 312.91 | More Effective |
| P70 | 307.71 | 310.63 | |
| P60 | 299.91 | 302.72 | |
| P50 | 293.47 | 295.39 | Average |
| P40 | 285.72 | 287.31 | |
| P30 | 276.03 | 273.92 | Low Effective |
| P25 | 271.80 | 273.81 | |
| P20 | 265.61 | 269.32 | Least Effective |
| P10 | 250.00 | 254.01 | |
| Median | 293.47 | 293.39 | |

Table 2
**Teacher Effectiveness Scale: Mean, Median and S.D. from
normative data and data from present study**

| Data base | N | Mean | Median | S.D |
|------------------|----------|-------------|---------------|------------|
| Normative data | 400 | 292.73 | 295.38 | 28.57 |
| Present study | 517 | 307.18 | 307.00 | 22.14 |

It may be inferred from the table 2 that the Mauritian primary school teachers are more effective than is expected in terms of the norms. The obtained t' value clearly shows that the teacher effectiveness as a whole is significantly higher than that of the normative data and their effectiveness fall in the 70th percentile (P70), indicating thereby that Mauritius primary teachers are highly effective in their teaching. This validates hypothesis 1 which stated that "There will be a high level of teacher effectiveness amongst primary school teachers".

Dimensions of Teacher Effectiveness:

The teacher effectiveness scale consists of 11 dimensions, viz. academic, professional (motivator, teaching skills, co-curricular activities, professional knowledge and classroom management), social, emotional, moral and personality domains. Each of these has been separately scored for which the N, Mean and Standard Deviation are given in table 3.

From the table-3, it may be established that Mauritius primary school teachers have scored higher than the mean score in the Teacher Effectiveness scale as well as in each of its 11 dimensions. This indicates that Mauritius teachers show high level of teacher effectiveness, that is, they are very effective in teaching. It is also observed that the teachers are higher than average in almost all the 11 dimensions that go to make the overall teacher effectiveness. In particular, the 'motivator' and 'co-curricular activities', which are part of professional dimension, show that these teachers are almost touching the maximum level. Despite the fact that all the participants scored above average level in all the dimensions, they were not as high as in the personality dimension.

Thus, the teacher effectiveness as assessed amongst the primary teachers of Mauritius showed that they were all having higher than average scores on the TE scale indicating that they possess a high level of teacher effectiveness and they are also higher than average in almost all dimensions of teacher effectiveness.

Table 3
Teacher Effectiveness Scale: Mean, SD and Maximum Possible Score in Each Dimension (N=517)

| Teacher Effectiveness and its dimensions | Mean score and SD for the Mauritius teachers | | Maximum possible score for scale as per the norm |
|--|--|-----------------------|--|
| | Male | Female | |
| Teacher Effectiveness Overall | M= 305.19 SD=19.52 | M=307.52 SD= 22.92 | 345 |
| 1. Academic Domain | M= 18.09 SD= 1.50 | M= 18.04 SD= 1.49 | 20 |
| 2. Professional Domain | M= 106.61 SD= 7.10 | M= 106.99 SD= 8.10 | 120 |
| i. Motivator | M= 18.04 SD= 1.34 | M= 18.05 SD= 1.52 | 20 |
| ii. Teaching Skills | M= 31.12 SD= 2.50 | M= 31.28 SD= 2.63 | 35 |
| iii. | Co-Curricular Activities | M= 13.26 SD= 1.63 | M= 13.26 SD= 1.67 |
| iv. | Professional knowledge | M= 26.31 SD= 1.88 | M= 26.63 SD= 2.20 |
| v. | Classroom | | |
| management | M= 17.89 SD= 1.37 | M= 17.78 SD= 1.62 | 20 |
| 3. Social Domain | M= 47.34 SD= 4.63 | M= 48.36 SD= 4.38 | 55 |

| | | | |
|-----------------------|----------------------|----------------------|----|
| 4. Emotional Domain | M= 35.32 SD= 2.49 | M= 35.66 SD= 2.93 | 40 |
| 5. Moral Domain | M= 44.97 SD= 2.77 | M= 45.52 SD= 3.67 | 50 |
| 6. Personality Domain | M= 52.69 SD= 3.59 | M= 53.08 SD= 4.30 | 60 |

This validates hypothesis 2 which stated that “Teacher effectiveness will have some dimensions which will count higher than others”.

Gender Influence on Teaching Effectiveness

Since the sample consisted of both male and female teachers, it was imperative to compare the teacher effectiveness by gender groups. Table below gives the teacher effectiveness scores of male and female teachers:

Table 4
Teacher Effectiveness Scores of Male and Female Teachers (N=517)

| Gender | N | Mean | SD |
|---------------|----------|-------------|-----------|
| Male | 119 | 305.19 | 19.52 |
| Female | 398 | 307.52 | 22.92 |

t-value= -1.006 df=515 P = Not significant

The obtained t’ value is less than the table value of 0.05 level. This reflects that there is no significant difference in the male and female teachers of Mauritius with regard to teacher effectiveness. In other words, both male and female teachers are equally effective in their teaching. So the hypothesis 3 which stated that there will be a significant difference between male and female teachers on teacher effectiveness, stands rejected. In other words, the gender has no such influence on teacher effectiveness.

CONCLUSIONS

The study reveals that the level of teacher effectiveness of Primary School teachers in Mauritius is higher than the expected level in terms of the normative data. The effectiveness falls in the 70th percentile (P70), indicating thereby that Mauritius primary teachers are highly effective in their teaching. The teachers have scored higher than the mean score in the TE scale as well as in each of its 11 dimensions. This indicates that they are very effective in teaching. In particular, the ‘motivator’ and ‘co-curricular activities’, which are part of professional dimension, show that these teachers are almost touching the maximum level. However, they were not very high as in the personality dimension. This calls for the professional development of primary school teachers on the behavioral training in personality development including affective domain. As such, no significant difference was found in the teacher effectiveness of male and female primary school teachers and both perform equally in their jobs. This reflects no specific intervention is required in teacher selection with respect to gender. The world of literature is on the same wavelength as results found in this study when they propose that an effective teacher is one who goes beyond the mere transmission of knowledge. He should have the charisma to motivate a student to learn, encourage the students to engage in extra-curricular activities and his personality is the factor which will act as the catalyst in the teacher student relationship.

REFERENCES

- Alao, I. F. (2013) Teacher effectiveness among female teachers in primary and secondary schools in southwestern Nigeria. *Journal of Educational Leadership in Action* 1, 2
- Ansari, M. A. & Ansari, M. A. (2000) Development of a measure of teacher effectiveness for IIUM. *Intellectual Discourse* 8, 2, 199-220.
- Basow, S. A. (2000) Best and worst professors: Gender patterns in students’ choices. *Sex Roles* 45, 407-417.
- Check, R.C. (2006) Professional persons in public organizations. *Educational Administration Quarterly* 8, 3, 1-11.

- Chowdhury, S. R. (2014) Effectiveness of secondary school teachers in relation to their gender, age, experience and qualification. *The Clarion-International Multidisciplinary Journal* 3, 1, 141-148.
- Dash, U. & Barman, P. (2016) Teaching effectiveness of secondary school teachers in the district of purba medinipur, West Bengal. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*. 21, 7, 50-63
- Evans, E. D. (2006) *Transition to Teaching*. Holt, Rinehart and Winston, New York.
- Gupta, M., & Jain, R. (2007) A comparative study of teaching effectiveness of the government and private school teachers trained through the formal and distance modes, *Indian Journal of Distance Education* 9, 61-75.
- Harrison, P. D. & Douglas, D. K. (2004) *The Relative Merits of Different Types of Overall Evaluations of Teaching Effectiveness*. *Research in Higher Education* 45, 3, 311-323.
- Kareem, J. & Bupha, R. (2014) A study on the self-concept of teachers working in government, aided and unaided colleges in bangalore. *The IUP Journal of Organizational Behavior* 8,1, 61-70.
- Kiadese, A. L. (2011) An assessment of the teaching effectiveness of prevocational subjects teachers in Ogun state, Nigeria. *International Journal of Vocational and Technical Education* 3, 1, 5-8.
- Ko, J. & Sammons, & P. (2012) Effective teaching: A review of research and evidence. Retrieved from <https://eric.ed.gov/?id=ED546794>
- Kumar, A. L. & Kumar, R. K. (2015). A study of teacher effectiveness of primary school teachers. *International Journal of Applied Research* 1, 8, 651-654
- Maathuis, E. H. Effective Teaching and Classroom Management is about Whole Child and Whole School Development for Knowledge, Skills and Human Values. Retrieved June 04, 2019, from <https://docplayer.net/8891821->
- Malik, U. and Sharma, D. K. (2013) Teaching effectiveness of secondary school teachers in relation to their professional commitment. *International Educational E-Journal* 2, 4, 148-155.
- Naik, K. P. & Mani, U. (2018) Study the teacher effectiveness of secondary school teachers in relation to gender, type and locality. *International Journal of Advanced Education and Research* 3, 3, 59-62
- Oyekan, S. O. (2000) *Foundations of Teacher Education. Measuring the Effects of Effective Teaching*. Retrieved April 20, 2018, from www.education-

world.com/a_issues.shtml.

- Sammons, P. & Mortimore, P. (1997) Differential school effectiveness: departmental variations in GCSE attainment *school field* 8, 1-2, 97-125
- Sammons, P. (1996) Complexities in the judgement of school effectiveness. *Educational Research and Evaluation* 2, 2, 113-49
- Smith, R. A., & Cranton, P. A. (1992) Students' perceptions of teaching skills and overall effectiveness across instructional settings. *Journal of Research in Higher Education* 33, 6, 747-764.
- Toor, K. K. (2014) A study of teacher effectiveness, general intelligence and creativity of secondary school teachers. *MIER Journal of Educational Studies, Trends & Practices* 4, 1, 51-65.

AUTHORS

Ms. Sharone Ramasawmy, Educational Psychologist, Ministry of Education, Government of Mauritius and Research Scholar, School of Education, ApeejayStya University, Gurugram

Dr. Vimala Veeraraghavan, Ex. Professor (Psychology), University of Delhi and Professor Emeritus, Indira Gandhi National Open University, New Delhi

Prof. Ananda Padhan, School of Education, Apeejay Stya University, Gurugram, Haryana

E-mail : anandapadhan@yahoo. com

**GENDER INFLUENCE ON THE DEVELOPMENT OF SCIENCE
TEACHING CONFIDENCE IN PRIMARY PRE-SERVICE
TEACHERS BECAUSE OF CONSTRUCTIVIST SCIENCE
EDUCATION COURSE**

Vinod Kumar Gupta

The present study examines the influence of gender variable on development of science teaching confidence in primary pre-service teachers as a result of constructivist science education course. Science teaching confidence of primary male and female pre-service teachers has been measured on the basis of personal science teaching efficacy (PSTE) and science teaching outcome expectancy (STOE) components of science teaching confidence. Science Teaching Efficacy Beliefs Instrument-B (STEBI-B) modified by Bleicher (2004) was used to collect data on science teaching confidence in male and female primary pre-service teachers as a result of treatment of constructivist science education course in the pre-service teacher education programme. STOE of male primary pre-service teachers was found significantly higher (.01 level) as compared to that of females after the transaction of the science education course using constructivist approach. There was no statistically significant difference in PSTE initial and final values of male and female teachers. The present study indicates that science teaching outcome expectancy of primary pre-service teachers is gender dependent and possibly factors like cultural background, biological development, specific teaching strategies etc. may be having their role. Further investigation is needed in this direction in different parts of the world.

INTRODUCTION

The analysis of the literature on the relationship of gender with science teaching confidence in primary pre-service teachers reveal that there is need for research on this aspect with specific reference to different cultural learning environments in various parts of the world. The reports are controversial from different parts of the world. Some studies indicate relationship of gender with science teaching confidence in pre-service primary teachers while others report no such relationship. Taylor and Coll(1999) reported that the mean values of personal science teaching efficacy (PSTE) related to entire sample, male and female as 50.58, 51.39 and 49.75 respectively. There was no significant difference in the mean values of male and female pre-service teachers. The present study investigates two research questions. Does gender (male/female) variable influence improvement in personal science teaching efficacy (PSTE) of pre-service primary teachers as a result of the use of constructivist science education course during pre-service primary teacher education programme in Fiji perspective? Does gender (male / female) variable predict improvement in science teaching outcome expectancy (STOE) in pre-service primary teachers as a result of the use of constructivist science education course during pre-service primary teacher education programme in Fiji perspective? The research objective of the present study is explore variations in science teaching confidence (personal science teaching efficacy and science teaching outcome expectancy) of male and female primary pre-service teachers as a result of the use of constructivist science education course in the primary pre-service programme in Fiji perspective.

LITERATURE REVIEW

Relationship of Gender with Science Teaching Confidence

There are controversial reports on the relationship of gender variable with PSTE and STOE, Certain studies from USA reveal higher PSTE and STOE higher in males as compared to females while most of the

studies mention no relationship of gender with PSTE and STOE.. Bleicher (2004) reported the gender, number of science courses taken, and school science experiences had significant associations with PSTE. Gender results for female and male PSTE scores indicated that there was a significant difference between mean PSTE scores for females and males. Males demonstrated significantly higher personal science teaching self- efficacy than did females. This finding is in agreement with a similar finding by Enochs and Riggs (1990). Joseph (2010) reported that the male science pre-service teachers had significantly higher STOE scores than their female peers. There was no significant difference in the personal science teaching efficacy (PSTE) and the science teaching outcome expectancy (STOE) between males and females in the combined population of 490 students. This pattern is similar when the non-science pre-service teachers are isolated.

No Relationship of Gender with Science Teaching Confidence

Most of the research studies on the relationship of gender with self-efficacy have been reported in various parts of the world like Australia, Fiji, India, Nigeria, Turkey, UAE, USA etc. reveal that there is no relationship of gender variable with self-efficacy (PSTE and STOE). Mulholland, Dorman and Odgers (2004) took a sample of 314 elementary pre-service teachers in an Australian University for providing their response to Science Teaching Efficacy Belief Instrument (Enoch & Riggs, 1990) with the aim to assess the impact of two science teaching subjects within the pre-service programme on their Personal Science Teaching Efficacy Beliefs (PSTE) and Science Teaching Outcome Expectancy (STOE). Teaching of two science teaching subjects within the pre-service program had a significant effect on PSTE but not on STOE. They also reported that gender factor had no effect on the values of PSTE and STOE.

Science Teaching Efficacy Beliefs Instrument (STEBI) was used in Fiji by Neil Taylor and Richard Coll (1999) to measure Personal Science teaching Efficacy (PSTE) and Science Teaching Outcome Expectancy (STOE) of 131 pre-service primary school teachers of which 63 were Fijian and 68 were Indian. PSTE mean scores for entire population, male and female primary pre-service teachers were 50.58, 51.39, and 49.75. There was no statistically significant difference between males and females.

Studies conducted in India also indicate that gender does not influence self- efficacy. Reddy and Sankar (2013) investigated impact of gender, locality, experience and type of management on the self-efficacy among secondary school teachers. The sample consists of 255 men and women secondary school teachers selected from rural and urban localities of Tirupati, Chittoor District of Andhra Pradesh. It was predicted that gender, locality, experience and management would significantly influence the self-efficacy of the secondary school teachers. Means, SDs and 't' test was employed to test the hypotheses. It is found that there is significant difference between teachers with below 5 years and above 5 years of working experience with regard to their self-efficacy, but there is no significant impact of gender, locality and management with regard to their self-efficacy. Kumar (2013) reported a comparative study of self- efficacy among Government and private school teachers. A sample of 247 Government and private teachers belonging to primary and secondary schools of Kanakapura of Ramanagara district, Karnataka during the academic year 2011-2012. Data regarding the self-efficacy of teachers were collected through simple random sampling technique through survey method. The tool used for the present study was Teacher Self Efficacy which was developed by researcher. The reliability of the test was determined by test-retest method. The test-retest reliability was found to be 0.78. The separate variance model of t-test was used for testing the hypotheses for the significance of mean difference in the self- efficacy scores of various groups of schools was compared. The findings

revealed that there is no significant difference of self -efficacy among gender belonging to different type of institutions. There is no significant difference of self -efficacy of male and female teachers belonging to government and private schools.

Studies conducted in Nigeria also reveal that there is no relationship of gender with science teaching confidence. Nneji (2013) examined the effect of teaching practice on pre-service basic science teachers' science teaching efficacy beliefs. Sample of the study was 340 pre-service basic science teachers (142 males and 198 females) enrolled in different public universities in South West Nigeria were taken as a sample. STEBI-B was administered to these pre-service teachers before and after their teaching practice. Descriptive statistics revealed that there was a significant difference in the pre and post mean values of PSTE and STOE. The pre and post values of PSTE were found 40.2735 and 45.2971 respectively. The mean values of pre and post STOE values were 29.3824 and 34.3529 respectively. No difference in PSTE and STOE due to gender variable

Pre- PSTE of male and female are 40.5306 and 39.9155 respectively;

Post PSTE of male and female are 45.5233 and 44.9789 respectively;

Pre STOE of male and female are 29.6616 and 28.9930 respectively;

Post STOE of male and female are 34.6616 and 33.9225 respectively.

Studies conducted in Turkey reveal that there is no relationship of gender with science teaching confidence. Sarikaya (2004) investigated teachers' science teaching efficacy beliefs with regard to gender in Turkey. There was no statistically significant difference between the mean scores of male and female pre-service elementary teachers' self-efficacy beliefs regarding science teaching on both the Personal Science Teaching Efficacy (PSTE) and the Science Teaching Outcome Expectancy (STOE) sub scales of the Science Teaching Efficacy Belief Instrument (STEBI-B) ($p > .05$). Male and female subjects for the study were 463 and 199 respectively: PSTE values of male and female investigated as 45.55 and 45.05 respectively. STOE mean value of male was 36.44 and that of

female was 38.12. Yilmaz and Cavas (2008) investigated the difference between male and female pre-service elementary teachers in Turkey with regard to their self-efficacy and classroom management beliefs before and after teaching practice. The subjects of this study were 185 pre-service teachers who were enrolled in two different state universities in Izmir, Turkey. Forty two of pre-service elementary teachers were from Ege University (7 males and 35 females), 143 of them were from Dokuz Eylul University (41 males and 102 females), and the whole were seniors being ready to be teachers in elementary schools. An independent t-test was used to determine if there was any significant difference between male and female pre-service elementary teachers with regard to their self-efficacy and classroom management beliefs before and after teaching practice. Results revealed that there was no significant difference between the mean scores of males and females' science teaching efficacy and classroom management beliefs ($p > .05$). Senemoglu, Demirel, Yagci, & Ustundag (2009) investigated the elementary school teacher's level of self-efficacy beliefs in teaching behaviours on the basis of gender, experience and level of achievement of the school they teach in. They used a instrument that had 32 items. Subjects ($N = 697$; females- 664; males- 33) were from various central districts of Ankara (Turkey). Self-efficacy beliefs of elementary school teachers were examined on the basis of gender, teaching experience and achievement level of the school where teacher teaches. Average score of self-efficacy beliefs was found at good level (average 4.13). There was no significant difference in the average values of self-efficacy in case of gender and experience; Range of score for 32 items was from 32 to 160. Female were at average value of 132.75 and males were at an average value of 134. Overall average was 4.13. Saracaloglu, Yen, and Ce, (2009) investigated the perception of science teachers about their self-efficacy change in relation to branch, sex, seniority of service, weekly course load, in-service training, satisfaction with his/her profession, and level of socio-economic status of the school. The research was conducted on the teachers working

in the science and class lessons in primary schools in Aydın, Turkey. The sample group consisted of volunteer teachers. The sample group was 132 people. 43.9% were science teachers (n=58) and 56.1% were elementary teachers (n=74). 54.5% of the attendants were women (n=72), 45.5% of the attendants were men (n=60). Science self-efficacy of male teachers was 48.15 and that of female was 48.40. There was no meaningful difference in the points of teachers by means of gender. Azar (2010) compared the levels of pre-service and in-service secondary science teachers' self efficacy beliefs relating to science teaching in relation to their demographic characteristics such as gender, the graduate school type, teaching experience and major. The study was conducted with 50 pre-service secondary science teachers and 75 secondary science teachers. As the data collection instrument, the "science teaching efficacy beliefscale" (STEBS) was used in this study. According to the research results, there was no significant difference between in-service and pre-service secondary science teachers' personal self- efficacy beliefs and outcome expectations about science teaching at level $\alpha = 0.05$. Moreover, these self -efficacy beliefs and outcome expectations did not change in relation to their gender, teaching experience, but the changes were there in relation to their graduate school type and major. Bayraktar (2011) investigated the effectiveness of a primary teacher education program in improving science teaching efficacy beliefs (personal science teaching efficacy beliefs and outcome expectancy beliefs) of pre-service primary school teachers. The study also investigated whether the program influences student teachers' attitudes toward science. Data were collected by administering the "Science Teaching Efficacy Beliefs Instrument" and "Attitudes toward Science Scale" to 282 pre-service primary teachers (147 freshmen, 135 seniors). Statistical techniques such as means and t-test were used to analyse the data. Results of the study showed that the primary teacher education program has a medium positive effect on science teaching efficacy beliefs of the primary pre-service teachers ($t = 4.791, p = .000$) and that there were no gender differences in terms of

efficacy beliefs. Results also indicated that pre-service primary teachers' attitudes toward science were moderately positive and differ by class level. Fourth-year pre-service teachers' attitudes toward science were found to be significantly more positive than the first years ($t = 5.494$, $p = .000$). There were no gender differences in attitudes toward science. Incik and Kilik (2014) investigated attitudes regarding the teaching profession, professional efficacy beliefs and vocational self-esteem of teacher candidates enrolled at education faculties and pedagogic formation programmes in Turkey with respect to their gender and their subject area. The results revealed that while there was a meaningful difference in attitudes regarding the teaching profession and vocational self-esteem of teacher candidates in favour of female participants, no difference is observed regarding self-efficacy beliefs. Findings also revealed that academic programs had no significant effect on candidate teachers' attitudes towards teaching and vocational self-esteem. In terms of teacher candidates' self-efficacy levels, a significant difference was found in favour of candidates enrolled in the pedagogic formation programme. Meaningful positive relationships were also observed between teacher candidates' scores on attitudes regarding the teaching profession and scores on professional efficacy beliefs; between scores on attitudes regarding the teaching profession and scores on vocational self-esteem; and between scores on self-efficacy beliefs and scores on vocational self-esteem.

Hassan and Tairab (2012) investigated science teaching self-efficacy and outcome expectancy beliefs of secondary school teachers in UAE. The purpose of this study was to determine the effect of three levels of subject matter taught, three levels of years of experience, and two levels of gender on two levels of self-efficacy beliefs, namely, personal science teaching efficacy belief, and science teaching outcome expectancy belief. Data for this study was collected from 230 secondary science teachers employed within various school zones in UAE. The participants' responses on both dimensions of the in-service STEBI-A scale were used to collect data.

Using a series of Kruskal-Wallis one way ANOVA and Mann-Whitney statistics revealed no significant differences in PSTE scores on levels of subject matter taught, years of teaching experiences and gender. However, the findings revealed only significant differences in STOE scores between the three levels of years of experiences

Joseph (2010) reported no significant difference in the personal science teaching efficacy (PSTE) and the science teaching outcome expectancy (STOE) between males and females in the combined population of 490 students. This pattern is similar when the non-science pre-service teachers are isolated. However, the male science pre-service teachers had significantly higher STOE scores than their female peers. Comparison of all students by gender (male -109); female-391; total-490. PSTE of male was 41.33 and that of female was 41.88. Mean value of STOE in case of male was 36.17 and that of female was 35.87.

The analysis of the above research findings indicate the further research is needed in different cultural learning environments on the relationship of gender variable with PSTE and STOE in primary pre-service teachers using constructivist science education courses in the primary pre-service teacher education programmes.

METHODOLOGY

Before-and-after survey study was followed (Burns, 1997). Questionnaire known as Science Teaching Efficacy Beliefs Instrument-B (STEBI-B) was used. It was initially developed by Enochs and Riggs (1990) and modified further by Bleicher (2004). Sample was taken from School of Education, Lautoka, Fiji National University, Fiji. The STEBI-B was administered to all the 300 pre-service primary teachers of the first year admitted in 2011 at two different phases, that is, at the beginning of trimester (initial phase) and the closing of the trimester (final phase), Software Package in Social Science (SPSS), IBM Version-20 was used to analyse data.

RESULTS AND DISCUSSION

Table 1
Changes in PSTE and STOE values in male and female primary pre-service teachers before and after the transaction of constructivist course

| Male-1; Female-2 | | PSTE1 | PSTE2 | STOE1 | STOE2 |
|-------------------------|--------------------|--------------|--------------|--------------|--------------|
| Male | Mean | 49.20 | 52.33 | 37.93 | 39.28 |
| | N | 40 | 40 | 40 | 40 |
| | Std. Deviation | 6.031 | 4.999 | 3.758 | 3.351 |
| | Std. Error of Mean | .954 | .790 | .594 | .530 |
| | Minimum | 35 | 40 | 30 | 33 |
| | Maximum | 60 | 60 | 45 | 46 |
| | Range | 25 | 20 | 15 | 13 |
| | Variance | 36.369 | 24.994 | 14.122 | 11.230 |
| Female | Mean | 49.29 | 52.82 | 37.40 | 36.71 |
| | N | 78 | 78 | 78 | 78 |
| | Std. Deviation | 5.413 | 5.391 | 4.145 | 3.828 |
| | Std. Error of Mean | .613 | .610 | .469 | .433 |
| | Minimum | 35 | 42 | 30 | 25 |
| | Maximum | 64 | 65 | 46 | 44 |
| | Range | 29 | 23 | 16 | 19 |
| | Variance | 29.302 | 29.058 | 17.178 | 14.652 |

| | | | | | |
|-------|--------------------|--------|--------|--------|--------|
| Total | Mean | 49.26 | 52.65 | 37.58 | 37.58 |
| | N | 118 | 118 | 118 | 118 |
| | Std. Deviation | 5.604 | 5.245 | 4.009 | 3.857 |
| | Std. Error of Mean | .516 | .483 | .369 | .355 |
| | Minimum | 35 | 40 | 30 | 25 |
| | Maximum | 64 | 65 | 46 | 46 |
| | Range | 29 | 25 | 16 | 21 |
| | Variance | 31.409 | 27.511 | 16.075 | 14.879 |

Table 2
ANOVA

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---------------------------------|----------------|----------|-------------|--------|------|
| PSTE1 * Male-1; Female-2 (Combined) | Between (Combined) Groups | .238 | 1 | .238 | .008 | .931 |
| | Within Groups | 3674.618 | 116 | 31.678 | | |
| | Total | 3674.856 | 117 | | | |
| PSTE2 Male-1: Female-2 (Combined) | Between (Combined) Groups | 6.492 | 1 | 6.492 | .234 | .629 |
| | Within Groups | 3212.262 | 116 | 27.692 | | |
| | Total | 3218.754 | 3218.754 | | | |
| STOE-1 Male-1: Female-2 (Combined) | Between (Combined) Groups | 3218.754 | 117 | 7.359 | .456 | .501 |
| | Within Groups | 7.359 | 1 | 16.150 | | |
| | Total | 1873.454 | 116 | | | |
| STOE-2 Male-1: Female-2 (Combined) | Between (Combined) Groups | 174.621 | 1 | 174.621 | 12.933 | .000 |
| | Within Groups | 1566.193 | 116 | 13.502 | | |
| | Total | 1740.814 | 117 | | | |

Table 3
Paired Samples Test

| | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---------------------|--------------------|-------------------|-----------------------|---|-------|-------|-----|--------------------|
| | Mean | Std. Deviation | Std. Error Mean | 99% Confidence Interval of the Difference | | | | |
| | | | | Lower | Upper | | | |
| PSTE2 - PSTE1 | 3.390 | 5.408 | .498 | 2.086 | 4.693 | 6.809 | 117 | .000 |

Table 4
Difference in Males and Females

| Details | PSTE2 | PSTE1 | Difference | Significance |
|-----------------------------|-------|-------|------------|--------------|
| Total PSTE2- Total PSTE1 | 52.65 | 49.26 | 3.39 | .01 level |
| MalePSTE2/ Male PSTE1 | 52.33 | 49.20 | 3.13 | .01 level |
| FemalePSTE2/ FemalePSTE1 | 52.82 | 49.29 | 3.53 | .01 level |

Gender Relationship with PSTE

Results (Tables 1-6) show relationship of gender with PSTE. The changes in male pre-service primary teachers indicate that there is an increase of 3.13 (52.33 – 49.20 =3.13) in the mean value of PSTE of male teachers from 49.20 to 52.33 which is a significant difference at .01 level (Table-4). There is a reduction in standard deviation (6.031 to 4.999), standard error of mean (.954 to .790), range of score (25 to 20) and range of variance in scores (36.369 to 24.994).The minimum score increased (35 to 40).The maximum score remained the same (60).

Table 5
Independent Samples Test

| | Variances | Levene's Test for Equality of | t-test for Equality of Means | | | | | | | | |
|-----------|-----------------------------|-------------------------------|------------------------------|-------|--------|------|-----------------|-----------------|-----------------------|---|-------|
| | | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 99% Confidence Interval of the Difference | |
| | | | | | | | | | | Upper | Upper |
| PST E2 | Equal variances assumed | .007 | .936 | -.307 | 116 | .759 | -.311 | 1.012 | -2.962 | 2.341 | |
| | Equal variances not assumed | | | -.310 | 87.220 | .757 | -.311 | 1.002 | -2.950 | 2.329 | |
| PST E1 | Equal variances assumed | .989 | .322 | .170 | 116 | .866 | .184 | 1.082 | -2.650 | 3.017 | |
| | Equal variances not assumed | | | .164 | 76.871 | .870 | .184 | 1.118 | -2.770 | 3.138 | |
| STO E2 | Equal variances assumed | .603 | .439 | 3.776 | 116 | .000 | 2.654 | | .813 | 4.495 | |
| | Equal variances not assumed | | | 3.937 | 95.399 | .000 | 2.654 | | .882 | 4.426 | |
| STO E1 | Equal variances assumed | 1.291 | .258 | .804 | 116 | .423 | .621 | | -1.401 | 2.643 | |
| | Equal variances not assumed | | | .821 | 89.806 | .414 | .621 | | -1.370 | 2.612 | |

Table 6
Measures of Association

| | Eta | Eta Squared |
|--------------------------|------------|--------------------|
| PSTE1 * Male-1; Female-2 | .008 | .000 |
| PSTE2 * Male-1; Female-2 | .045 | .002 |
| STOE1 * Male-1; Female-2 | .063 | .004 |
| STOE2 * Male-1; Female-2 | .317 | .100 |

Changes in PSTE in female pre-service primary teachers indicate that the difference in the mean value ($52.82 - 49.29 = 3.53$) of the total female PSTE 2 (52.82) and the mean value of female PSTE1 49.29 is significant at .01 level (Table-4). There is a reduction in standard deviation (5.413 to 5.391) and standard error of mean (.613 to .610). The minimum score increased from 35 to 42. The maximum increased from 64 to 65. The range reduced from 29 to 23. The variance is reduced from 29.302 to 29.058.

The results in the present paper are in line with Enochs and Riggs (1990) and Bleicher (2004) who mention in their studies that gender has significant associations with PSTE. According to Bleicher(2004), males demonstrate significantly higher personal science teaching self- efficacy as compared to females. The results in the present paper are not in line with reports from Australia (Mulholland, Dorman & Odgers, 2004), Fiji (Taylor & Coll, 1999), India (Reddy & Sankar, 2013; Kumar, 2013), South West Nigeria (Nneji, 2013), Turkey (Azar, 2010; Bayraktar , 2011; Incik & Kilik, 2014; Saracaloglu, & Yenice 2009; Sarikaya, 2004; Senemoglu, Demirel, Yagci. & Ustundag, 2009; Yilmaz & Cavas, 2008);

No Gender Relationship with STOE

The results (Tables 1- 6) in the present study reveal that in case of male primary pre-service teachers, STOE value increased from 37.93 to 39.28

but it was not statistically significant. There was a decrease in standard deviation (from 3.758 to 3.5310) and standard error of mean (from 00.594 to 00.530). Minimum score increased from 30 to 33. Maximum score increased from 45 to 46. Range decreased from 15 to 13. Variance decreased from 14.122 to 11.23.

In case of female primary pre-service teachers, STOE value decreased slightly from 37.40 to 36.71. Standard deviation decreased from 4.145 to 3.828. Standard error of mean decreased from 00.469 to 00.433. Minimum score decreased from 30 to 25. Maximum score decreased from 46 to 44. Range increased from 16 to 19. Variance decreased from 17.178 to 14.652. Total STOE changes in male and female primary pre-service teachers reveal no change in the mean value of STOE. Standard error decreased from 4.009 to 3.857. Standard error of mean decreased from 00.369 to 00.355. Minimum score decreased from 30 to 25. Maximum score remained the same (46). Range increased from 16 to 21. Variance decreased from 16.075 to 14.879.

The results of the present study are not in line with findings of Joseph (2010) who reported that the male science pre-service teachers had significantly higher STOE scores than their female peers. Most of the past work done in Australia, India, Nigeria, Turkey show no relationship of gender with STOE.

Mulholland, Dorman and Odgers (2004) reported that gender factor had no effect on the values of STOE. They took a sample of 314 elementary pre-service teachers in an Australian University for providing their response to Science Teaching Efficacy Belief Instrument (Enoch & Riggs, 1990) with the aim to assess the impact of two science teaching subjects within the pre-service programme on their Science Teaching Outcome Expectancy (STOE). Teaching of two science teaching subjects within the pre-service program had no significant effect on STOE. In India, Kumar (2013) reported no significant difference of self-efficacy of

male and female teachers belonging to government and private schools. He conducted a comparative study of self- efficacy among Government and private school teachers. A sample of 247 Government and private teachers belonging to primary and secondary schools of Kanakapura of Ramanagara district, Karnataka during the academic year 2011-2012. Data regarding the self -efficacy of teachers were collected through simple random sampling technique through survey method. In South West Nigeria, Nneji (2013) reported no difference in STOE due to gender variable. He examined the effect of teaching practice on pre-service basic science teachers' science teaching efficacy beliefs. Sample of the study was 340 pre-service basic science teachers (142 males and 198 females) enrolled in different public universities in South West Nigeria were taken as a sample. STEBI-B was administered to these pre-service teachers before and after their teaching practice.

Several studies have been reported from Turkey showing no relationship of gender with STOE. Sarikaya (2004) reported that there was no statistically significant difference between the mean scores of male and female pre-service elementary teachers in the Science Teaching Outcome Expectancy (STOE) subscales of the Science Teaching Efficacy Belief Instrument (STEBI-B) ($p > .05$). Yilmaz & Cavas (2008) investigated the difference between male and female pre-service elementary teachers in Turkey with regard to their self-efficacy and classroom management beliefs before and after teaching practice. Results revealed that there was no significant difference between the mean scores of male and female pre-service elementary teachers' science teaching efficacy and classroom management beliefs ($p > .05$). Senemoglu, Demirel, Yagci and Ustundag (2009) investigated the elementary school teacher's level of self -efficacy beliefs in teaching behaviours on the basis of gender, experience and level of achievement of the school they teach in. There was no significant difference in the average values of self-efficacy in case of gender and experience; Saracaloglu, Yen and Ce, (2009) investigated the perception of science

teachers about their self-efficacy change in relation to branch, sex, seniority of service, weekly course load, in-service training, satisfaction with his/her profession, and level of socio-economic status of the school. Science self-efficacy of male teachers was 48.15 and that of female was 48.40. There was no meaningful difference in the points of teachers by means of gender. Azar (2010) compared the levels of pre-service and in-service secondary science teachers' self - efficacy beliefs relating to science teaching in relation to their demographic characteristics such as gender, the graduate school type, teaching experience and major. According to the research results, there was no significant difference between in-service and pre-service secondary science teachers' outcome expectations about science teaching at level $\alpha = 0.05$. Bayraktar (2011) investigated the effectiveness of a primary teacher education program in improving outcome expectancy beliefs) of pre-service primary school teachers. Results revealed that there was no gender differences in terms of efficacy beliefs Incik. Kilik (2014) investigated attitudes regarding the teaching profession, professional efficacy beliefs and vocational self-esteem of teacher candidates enrolled at education faculties and pedagogic formation programmes in Turkey with respect to their gender and their subject area. The results revealed no difference with regard to self-efficacy beliefs.

CONCLUSION

The present study is an effort to investigate the controversial issue of the relationship of gender with development of science teaching confidence (PSTE and STOE) of primary pre-service teachers who are being taught using constructivist science education courses in the three year B.Ed. (primary) programme, Fiji. The results indicate that male pre-service primary teachers show statistically significant improvement in PSTE component of science teaching confidence as compared to female primary pre-service teachers. STOE, component of science teaching

confidence has no relationship with gender. The positive relationship of PSTE component of science teaching confidence in the present study do not support most of the previous report on no such relationship. The differences in the past reports and the present investigation may be due to factors like culture, psychology of the teacher, proper use of methodology of teaching, research design or other unknown factors. The implication of the study is that further research may be pursued on the relationship of gender with PSTE in diverse cultural settings and diverse active learning environments in teacher education institutions. Results in the present study on STOE component of science teaching confidence support most of the previous reports that gender has no relationship with STOE.

REFERENCES

- Azar, A. (2010) In-service and pre-service secondary science teachers' self-efficacy beliefs about science teaching. *Educational Research and Reviews* 5, 4, 175-188.
- Bayraktar, S. (2011) Turkish pre-service primary school teachers' science teaching efficacy beliefs and attitudes toward science: The effect of a primary teacher education program. *School Science and Mathematics* 111, 3, 83–92.
- Bleicher, R. E. (2004) Revisiting the STEBI-B: Measuring self-efficacy in pre-service elementary teachers. *School Science and Mathematics* 104, 8, 1-10.
- Enochs, I. & Riggs, I. (1990). Further development of an elementary science teaching efficacy belief instrument: A pre-service elementary scale. *School Science and Mathematics* 90, 8, 694.-706
- Hassan, A.A. & Tairab, H.H. (2012) Science teaching self-efficacy and outcome expectancy beliefs of secondary school teachers in UAE. *International Journal for Research in Education (IJRE)* 32, 1-22.
- Incik, E.Y. & Kilik, F. (2014) Attitudes regarding teaching profession, professional efficacy beliefs and vocational self-esteem of teacher candidates enrolled at education faculties and pedagogic formation programmes. *International J. Soc. Sci. & Education* 4, 2, 380-391.

- Joseph, J. (2010) Does intention matter? Assessing the science teaching efficacy beliefs of pre-service teachers as compared to the general student population *Electronic Journal of Science Education* 14, 1, 1-14.
- Kumar, T. P. (2013) A Comparative Study of self - efficacy among government and private school teachers. *Global Research Analysis* 2, 1, 33-34.
- Mulholland, J., Dorman, J. P. & Odgers, B. M. (2004) Assessment of science teaching efficacy of pre-service teachers in an Australian university. *Journal of Science Teacher Education* 15, 4, 313-331.
- Nneji, L. M. (2013) Examining the effect of teaching practice on pre-service basic science teachers' science teaching efficacy beliefs. *Indian Streams Research Journal* 5, 1-9.
- Reddy, P. V. & Sankar, V. S. (2013) Self-efficacy among secondary school teachers. *Indian Journal of Research* 2, 12, 61 – 63.
- Saracaloglu, A. S., Yen, N. & Ce (2009) Investigating the self-efficacy beliefs of science and elementary teachers with respect to some variables. *Journal of Theory and Practice in Education* 5, 2, 244-260.
- Sarikaya, H. (2004) Pre-service elementary teachers' science knowledge, attitude toward science teaching and their efficacy beliefs regarding science teaching. Master's dissertation. The Graduate School of Natural and Applied Sciences of Middle East Technical University.
- Senemoglu, N., Demirel, M., Yagci, E. & Ustundag, T. (2009) Elementary school teacher's self-efficacy beliefs: A Turkish case. *Humanity & Social Science Journal* 4, 2, 164-171.
- Taylor, N. & Coll. R. (1999) Pre-service primary teacher's self-efficacy in science teaching: The Fiji perspective. *Pacific- Asian Education* 11, 1, 31-44.
- Yilmaz, H. & Cavas, P. H. (2008) The effect of the teaching practice on pre-service elementary teachers' science teaching efficacy and classroom management beliefs. *Journal of Mathematics, Science & Technology Education* 4, 1, 45-54.

AUTHOR

Prof. Vinod Kumar Gupta, House No. 1665, Sector 7, Urban Estate,
KURUKSHETRA - 136 118
E-mail: vkgucek@gmail.com

**TEACHING COMPETENCY OF SECONDARY SCHOOL
TEACHERS IN RELATION TO THEIR AGE,
EXPERIENCE AND GENDER**

Narayan Prasad Behera

The phenomenal explosion of knowledge has mounted a lot of pressures on the teachers. Teacher in 21st century needs to be equipped with modern competencies to cater the learners' diversified needs. Focus of the study was to develop and validate a questionnaire for measuring teachers' teaching competency and extent which teaching competency is altered with the teachers' age, experience and gender? A sample of one hundred and twenty students is involved using simple random sampling technique. Both exploratory and confirmatory factor analysis together with multiple logistic regressions are used for data analysis. Exploratory factor analysis embarked with 14 high factor loading (ranging from 0.50 to 0.79) teaching competency items. These items are accepted at the significance threshold of $p < 0.01$. Confirmatory factor analysis unveiled that the overall results of the model was moderately fit and the multiple logistic regression indicated that, though, there is effect of age, experience and gender on teaching competency but is not statistically significant. Based on the findings, it is recommended that the teacher education curriculum developers should focus more on the development of teachers' teaching skills including inter and intra personal skills to meet the diversified needs of the learners rather than focusing on the teachers' demographic parameters, while preparing the curriculum for teacher education programme.

INTRODUCTION

It goes without saying that education is a liberating and an evolutionary force that contributes to an individual's consciousness. This force enables the individual to rise from materiality to superior planes of intellectual and spiritual consciousness. One's consciousness is raised as he/she

is exposed to the situations/conditions of the past, the present and the future. Therefore, function of the education can be explained by asserting the past is our foundation, the present is our material and the future is our aim and summit. Each (the past, the present and the future) must have its due and natural place in a national system of education, which is the key in the process of all developments. This cannot be realized only securing enough teachers in the schools, rather the most important is securing the right type of teachers with right type of knowledge, skills, attitudes and competence as has been claimed by educationist all over the world.

Moreover, being a multifaceted country, India faces serious challenges in terms of teachers' inputs, learners' profiles and cultural variations. Besides, it is obvious that the 21st century has witnessed phenomenal explosion of knowledge in general and technological innovation in particular which have mounted a lot of pressures on the fiber of social network as well as posed an uphill task on the teachers community for corresponding changes in instructional technology particularly in the field of pedagogy. Thus, a teacher in 21st century needs to be equipped with modern competencies to work effectively to cater for the needs of present-day society. Even, often, recruitment of teachers needs to follow some sort of standards and teachers' teaching competencies are one of those standards.

The term "Competency" and "Competence" are used interchangeably (Passi & Lalita, 1994). Competence is personal traits or a set of habits that leads to more effective and superior job performance (Chouhan & Srivastava, 2014). Similarly, Richards and Schmidt (2002, p. 94) described competence as "a description of essential skills, knowledge and behaviors required for the effective performance of a real-world task of activity". This conception covers three key domains – 'skills, knowledge and behaviors' that determine the effectiveness of performing an action. Walker (1992), had come up with a definition of competence—the

attributes (knowledge, skills and attitudes) which enable an individual or group to perform a role or set of tasks to an appropriate level or grade of quality or achievement (i.e. an appropriate standard) and thus make the individual or group competent in that role. Relating to learners, Halls and Jones (1976, p. 376) defined competencies as—composite skills, behavior or knowledge that can be demonstrated by the learner and desired from explicit conceptualization of the desired outcomes of learning competencies are states so as to make possible the assessment of student learning through direct observation of student behavior. In view of the teacher, Bailey (2006, p. 210) described competence as “statements about what teachers are supposed to know and be able to do”.

Thus, teaching competencies include the acquisition and demonstration of the composite skills (skill of introducing a lesson, skill of questioning, skill of explaining, skill of understanding child psychology, skill of classroom management, skill of assessment etc.) required for student teaching. Passi and Lalita (1994) described that “Teaching competency means an effective performance of all observable teacher behaviour those beings about desired pupil outcomes” (p.4). Venkataiah, (2000) defined teaching competency as any single knowledge, skill or professional expertise which (i) a teacher may be said to possess and (ii) the possession of which is believed to be relevant to the successful practice of teaching. NCTE (1998) identified ten competency categories – contextual competencies, conceptual competencies, content competencies, transactional competencies, competencies related to other educational activities, competencies to develop teaching learning material, evaluation competencies, management competencies, competencies related to working with parents and competencies related to working with the community.

The construct teaching competency can be described as the extent to which the teacher possesses the requisite knowledge and skills to perform teaching task exploring the possibility of generating human as well as physical resources from the community. Nevertheless, it this construct that refers to the right way of conveying the set of knowledge, skills and applications to the students by understanding and applying the child psychology and realizing the needs and demands of the parents as well as the community. The right way does not include a mere acquisition of content and transactional strategies rather it includes multi-dimensional activities in and outside the classroom. Categorically in this study, teaching competency has been measured on four core dimensions, i.e. pedagogical competency, classroom management competency, evaluation competency and lastly extensional competency.

However, in terms of the instruments used to evaluate teaching competency and the effect of demographic parameters on teaching competency, a certain disparity has been observed, although they do have certain aspects in common. A series of studies were carried out in this regard. Sharma (2006) revealed that teaching aptitude of pupil teachers was very significantly associated with their general teaching competence, professional interest and academic achievements. Sharma further added that general teaching competence and professional interest significantly affect the teaching aptitude of pupil teacher. Similarly, Gracious (2011) came up with evidence that there was no significant relationship between creativity and teaching competency of prospective teachers. Besides, Dwivedi (2012) found that teacher education programme at secondary level was effective in enhancing teaching competence of prospective teachers and was equally effective in enhancing teaching competence of both female and male prospective teachers. Padmanabhaiah and Bhagavan (1994) revealed a significant difference in the teaching effectiveness of male and female student teachers. The female teachers proved to be more effective in their teaching than their male counterparts, while no

significant relation was found between educational qualifications and teaching effectiveness. Even, Chang (2000) agreed that the male teachers were found to be rated significantly better performer than the female teachers. The finding unveiled by Mary and Sundarajan (2004) came with a conclusion that qualification influences the teaching competency of science teachers and Das (1997) landed adequate support by exhibiting that post-graduate teachers were found to be more effective than the graduate teachers but no significant difference could be between male and female teachers in respect to their teaching effectiveness. Shanavaz (2007) concluded that male teachers were found to be more competent in their teaching than female teachers. Selvam (2010) found no significant difference of teaching competency on the basis of gender and locality. Subsequently, Tyagi (2013) evidenced that social background, marital status, type of schools, teaching experience, teaching subjects and qualifications influenced teaching effectiveness of secondary school teachers, while Ahmad and Khan (2016) claimed that qualification does not affect the teaching competency of secondary school teachers. Moreover, Himabindu (2012) explored that the teaching competency does not alter with the changes in sex and age but get altered in relation to the locality, experience, marital status, and the type of institution.

The literature available shows that factors including – attitudes, aptitudes, age, experiences, gender, motivation towards teaching, intelligence, creativity, qualifications, type of schools, marital status, kind of training etc. were taken into account to be the predictors of teachers' teaching competency. However, a significant observation is made from the literature that measuring teachers' teaching competency in India has been used mostly either the Baroda General Teaching Competence Scale (BGTC) or Indore General Teaching Competence Scale (IGTC) which may not be relevant for the changing cultural context. Again some of the researchers had administered self-developed questionnaire without ensuring the reliability and validity. Hence trustworthiness of

data collected through that instrument is apparent to cynical, as there is apparently a great deal of diversity in terms of establishing which factors are representative of teaching competency. Besides, inference made for teaching competency vis-à-vis selective demographic parameter is felt to be inconclusive. Thus, taking all aspects into consideration, the study objective was to design and validate a measuring instrument allowing for the evaluation of secondary school teachers teaching competency. In addition to that, the effect of selective demographic parameters on teaching competency was to be determined.

METHODOLOGY

Participants

The sample consisted of 120 secondary school students to give opinion on their teachers' teaching competency. These students were selected randomly from the schools located in Simulia and Soro Block under Balasore district of Odisha and data collected were used to carry out the exploratory factor analysis at first and then was used in the confirmatory factor analysis. Subsequently, information pertaining to the age, experience and gender were collected from the same 120 teachers (53 men and 67 women, aged 24 to 48 [Mean = 32.738; S.D. = 5.487]).

Measurements

The final version of the evaluation of teaching competency questionnaire consisted of 14 items which were grouped into four factors: pedagogical competency, with four items, class room management competency, with four items, evaluation competency, with three items, and extensional competency, with three items. The items were assessed using a Likert scale with a scoring range between 1 (completely disagree) and 5 (completely agree).

Procedure

With respect to the development of teaching competency scale, the researcher first enlisted all the possible dimensions of competent teacher

after discussing with teacher educators, teachers themselves, headmasters and by consulting various related literatures (Dutt & Rao, 2001; Klaassen, 2002; NCTE, 1998; Mukhopadhyay & Nurula, 2000). Subsequently, it was subjected to the experts concerned to get the dimensions and indicators finalised. Further, items pertaining to the specific domain of teaching behaviour were constructed and subjected to the experts concerned to get further suggestions. After receiving suggestions from the experts, the questionnaire was revised and refined in terms of the language ambiguity, vagueness and ensured objectivity. The overlapping of items was also critically examined. In this way, the items/statements of teaching competency scale were thoroughly screened, edited and prepared. After preparation of the items/statements of the questionnaire, they were subjected to a tryout and revision. Finally, both exploratory and confirmatory factor analysis was conducted to determine the most valid items.

Data analysis

With a view to determine and evaluate the teacher competency's factor structure, an exploratory factor analysis and confirmatory factor analysis were carried out, respectively. The composite reliability and construct validity in terms of convergent validity were established. Furthermore, multiple logistic regressions were carried out to examine the effect of age, experience and gender on teaching competency. The SPSS 21.0 and AMOS 21.0 statistical packages were used for the whole data analysis.

RESULTS

Exploratory factor analysis

After several exploratory factor analyses, certain items were eliminated due to not reaching a minimum rotation of .40. Finally, a factor analysis was carried out for main components with Varimax rotation, the results of which were 14 items grouped into four factors: classroom management competency (made up of four items: 28, 43, 44 and 52), pedagogical

competency (made up of four items: 12, 13, 18, and 22), evaluation competency (made up of three items: 36, 37, and 40), and extensional competency (made up of three items: 38, 41, and 48). The eigen values obtained were greater than 1.00 (4.88, 1.74, 1.16, and 1.04 respectively), explaining a total variation of 63.05% (34.88%, 12.44%, 8.32% and 7.41%, respectively).

Finally, the following items depicted in table 1 are accepted at the significance threshold of $p < 0.01$ and all items also exhibited high factor loading.

Table1
Evaluation of Teaching Competency Questionnaire

| <i>Items</i> | <i>Components</i> | | | |
|--|-------------------|-----------|-----------|-----------|
| | <i>F1</i> | <i>F2</i> | <i>F3</i> | <i>F4</i> |
| 1. My teacher mostly uses physical punishment to make students discipline | 0.708 | | | |
| 2. In order to ensure mastery-learning among students, my teacher monitors the progress of class continuously | 0.684 | | | |
| 3. My teacher prepares tests in order to measure our competency level | 0.676 | | | |
| 4. My teacher engages the talented students for his/her growth by allowing him/her to help weaker students of their class and by providing challenging task for practice | 0.671 | | | |

Narayan Prasad Behera

| | | | | |
|--|--|--------------|--------------|--------------|
| 5. My teacher uses different approaches for effective teaching | | <i>0.789</i> | | |
| 6. My teacher manages the class to make good use of time and resources, to minimize interruptions, and to keep students engaged. | | <i>0.673</i> | | |
| 7. My teacher gets parents engaged in the process of education reformation | | <i>0.625</i> | | |
| 8. My teacher feels burden to connect the content to students' prior knowledge and to real world. | | <i>0.496</i> | | |
| 9. My teacher assesses our performance statuses before and after of each instructional session. | | | <i>0.769</i> | |
| 10. My teacher diagnoses our strength and weakness | | | <i>0.697</i> | |
| 11. My teacher tries to identify the learning gaps during teaching | | | <i>0.666</i> | |
| 12. My teacher discusses with our parents about our performances | | | | <i>0.757</i> |

| | | | | |
|--|--|--|--|-------|
| 13. To remove the learning difficulties of the students, my teacher makes use of remedial teaching programs. | | | | 0.662 |
| 14. My teacher mostly helps us by facilitating learning | | | | 0.643 |

Confirmatory factor analysis

A confirmatory factor analysis (CFA) was carried out based on 14 observed items and on the four independent correlating latent constructs. The model was reduced in order to maintain reasonable degrees of freedom. Thus, the items that made up each of the dimensions were divided into four groups. The validity of the measuring model was considered using a series of fit index, also called goodness of fit measures: χ^2 , $\chi^2/d.f.$, RMSEA, and the incremental indices (GFI, CFI, NFI and TLI). After an initial analysis, the overall results of the model indicated a moderate fit ($\chi^2(71, N = 120) = 124.749, p = .000; \chi^2/d.f. = 1.757 < 5; GFI = .88, CFI = .894; NFI = .79; TLI = .86; RMSEA = .08$).

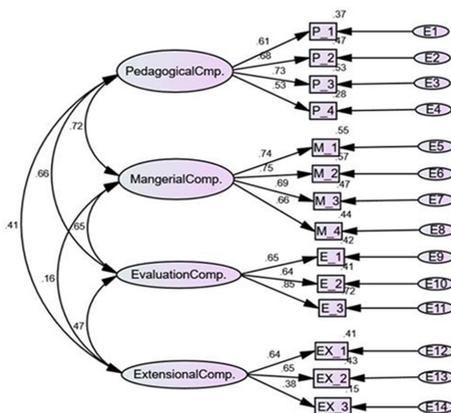


Figure 1: Final Measurement Model for Teaching Competency

The composite reliability index of each of the factors resulting from the factor analysis presented the following results: 0.74 for classroom management, 0.80 for pedagogical, 0.60 for evaluation and 0.58 for extensional competency. Considering all of the items in a single factor, the consistency obtained was 0.91. Further, the convergent validity index of each of the factors is: 0.41 for classroom management, 0.51 for pedagogical, 0.52 for evaluation and 0.33 for extensional competency. This indicates that the average variance extracted is greater than the reliability coefficients of each of the factors and hence the construct validity in terms convergent validity is established.

Table 2

The parameter estimates (β) and corresponding odds ratio for the effect of age, experience and gender on teaching competency

| Effect | B | SE | Wald | Sig./P-Value | Exp (β) / OR |
|-------------------|-----------|-------|-------|--------------|----------------------|
| Gender | - | - | - | - | - |
| Male | Reference | - | - | - | - |
| Female | .392 | .386 | 1.028 | .311 | 1.480 |
| Experience | - | - | - | - | - |
| High | Reference | - | - | - | - |
| Low | -.810 | .516 | 2.465 | .116 | .445 |
| Age | .012 | .034 | .127 | .722 | 1.012 |
| Constant | -.145 | 1.274 | .013 | .909 | .865 |

The results of the model indicate that the age is not associated significantly with teacher competency as ($P = 0.722 > 0.05$). It implies that competency of teacher is not significantly altered / changed) as they are ageing up or getting older. However, β is positive ($\beta = 0.012$), which means that the predicted probability of being competent teacher is higher at higher age. Moreover, from odds ratio, it is confirmed that odds of being competent

teacher is about 1 times for unit increase in age.

Similarly, gender has no significant influence on teacher competency as ($P = 0.311 > 0.05$). This indicates that the likelihood of being competent teacher is exhibited insignificant difference between male and female teachers. Though not significant, the result indicated that being a female, the level of competency is better than the male teachers as ($\beta=0.392$) is positive. Moreover, the odds of being competent for female teachers are about 1.5 times that of male teachers. This means the female teachers were more likely to be competent in performing their instructional activities as compared to male teachers as odds ratio is >1 .

On the other hand, the odds ratio for teaching experience ($OR = 0.445 < 1$) indicates that less experience teachers are exhibiting less competency than that of teachers with more experience. However, it was noted that the existing difference in teacher's competency is not statistically significant ($P = 0.116 > 0.05$). This suggests that the risk of being competent teacher is not more prevalent when teachers are novice in teaching profession. The Cos & Snell R square coefficient was 0.027. This indicates that about 3% of the variability is likelihood of being competent teachers can be explained by age, gender and experience. The fitted equation model is:

DISCUSSION AND CONCLUSION

A creative carpenter can only be successful if he or she knows the basic rudiments of carpentry. The same applies to a successful competent teacher, in terms of pedagogical skills and underlying content knowledge together with classroom management and evaluation skills. Besides, teaching as a profession and the profile of teachers has been constantly altering over time in pluralistic country like India. Therefore, the core objective of the study was to design and validate a measuring instrument that allows to evaluate secondary school teachers' teaching performance. The design and validation of measuring instrument is anticipated to

be a key tool in attempting to optimize teaching competency and thus an objective assessment could be possible. The exceptionality of this measuring instrument is, this questionnaire is rated by students because students at secondary level is hypothesized as mature enough to judge about the quality of certain phenomenon. Again, nobody can claim that students are not the beneficiaries of classroom teaching. They observe and experience teaching of a teacher on a continuous and long term basis. Thus, they can provide most valid information about the competency of a teacher. This logic was supported by (Hart, 1934; Marsh & Roche, 1997; Mohanty, 2006). Taking into account this logic, the evaluation of teaching competency questionnaire, the suggestions contributed by the exports and the respective confirmatory factor analysis came with an instrument made up of 14 items grouped into four factors (pedagogical, managerial, evaluation and extensional) with high reliability and validity. Teachers' pedagogical competency is explored as to what extent a teacher demonstrates the skill of using different pedagogical approaches, skill of managing instructional time and learning resources, skill of engaging parents in the teaching and learning process, and skill of connecting content to the previous knowledge of the learner and to the real world with a view to make more meaningful learning. Similarly, classroom management competency is conceived as degree to which a teacher exhibits the ability of demonstrating: how to maintain students' discipline, how to monitors the progress of class on regular basis, and how to engage talented students to help weak learners. Again, evaluation competency is envisioned as to what amount a teacher displays the competency of: assessing learners' performance before and after of each instructional session, diagnosing learners' strength and weakness, and identifying learning gaps. Finally, it is unveiled that teachers get engaged themselves with parents to discuss their children's performance, organize remedial teaching, and help learners by facilitating learning and hence it is termed as teacher's extensional competency.

The findings displayed above are inconformity with the theoretical analysis done by (NCTE, 1998; Mukhopadhyay & Nurula, 2000). Despite the theoretical links, in recent past, an empirical study carried out by Dodeen (2013) lends adequate support to the findings of present study. He developed and used a questionnaire with 29 items grouped into five dimensions: Knowledge and organization of the professor (7 items), Clear explanation (6 items), Rating and evaluation (6 items), Teaching methods (4 items), and the Relationship with students (6 items). In compliance with the domains explored through data reduction technique, Toland and Alyala (2005) came up with three dimensions. Such dimensions are: Delivery of course information, professor-student interaction, and the regulation of the students' learning.

It is this understanding could be suggested that, though this questionnaire came up with sound validity and reliability indices necessary for evaluating teachers' teaching competency but there are still certain controversies found in the literature on the domains of teaching competency evaluation. Thus, this questionnaire may not be a sufficient to guarantee a successful evaluation of teaching competency. Thus, researcher may develop his/her own tool for the same unless it meets the demands.

Besides, the researcher has also drawn an interesting conclusion when the effect of age, experience and gender on teaching competency evaluated. In this venture, it is revealed that age is not associated significantly with teacher competency because competency of teacher is not significantly altered when teachers are ageing up or getting older. This finding is congruent with the findings unveiled Himabindu (2012). However, β coefficient is found to be positive. This implies that the predicted probability of being competent teacher is higher at higher age and vice versa and the same has been confirmed again from the odds ratio.

Furthermore, the researcher has also evidenced that teaching experience does not affect the teaching competency, because teachers with high

experience did not display adequate content knowledge along with pedagogical, managerial and evaluation skills than teachers with low experience teachers. This result is in conformity with the finding disseminated by Himabindu (2012) as teaching competency was found not to be altered with the changes of experience. However, Tyagi (2013) refuted the current finding by claiming that there exists a significant relationship between teaching experience and teachers' teaching competence.

Moreover, gender has no significant influence on teacher competency is also revealed. This result is consistent with the findings delineated by Padmanabhaiah & Bhagavan (1994), Chang (2000) and Shanavaz (2007), who claimed that there is no significant difference of teaching competency based on gender. Conversely, when β coefficient and corresponding odds ratio were observed, remarkably interesting result emerged. Such specific finding was, though gender does not influence significantly to teaching competency, but the β coefficient indicated that being a female, the level of competency is better than the male teachers. Even, it is confirmed from the odds ratio that female teachers were more likely to be competent in performing their instructional activities as compared to male teachers. This result is again in conformity with the findings unveiled by Das (1997), and Selvam (2010). Eventually, it can be confirmed that there is no significant effect of age, experience and gender on teachers teaching competence. The possible reason is being that the similar kind of teacher education programme is offered nationwide and the quality is assured by the same authority (NCTE, 1998). This assumption is received empirical support by Dwived. He asserted that the existing teacher education programme is not only effective in enhancing teaching competency of perspective teachers but also equally effective in enhancing teaching competence of both female and male prospective teachers.

REFERENCES

- Ahmad, J., & Khan, M. (2016) A Study of teaching competency of secondary school teachers in relation to their educational qualification, stream and type of school. *International Journal of Applied Research 2, 2, 68-72.*
- Bailey, M. K. (2006) *Language Teacher Supervision: A Case-Based Approach.* Cambridge University Press, Cambridge.
- Chang, T. S. (2000) What are Teachers' College Students Telling us about them? Paper Presented at the Annual Meeting of the American Educational Association.
- Chouhan, V. S., & Srivastava, S. (2014) Understanding competencies and competency modeling - A Literature Survey. *IOSR Journal of Business and Management 16, 1, 14-22.*
- Das, A. B. (1997) *Impact of Secondary Teacher Education Programme on Teacher Effectiveness and Teacher Job Satisfaction.* APH Pub. Corp., New Delhi.
- Dodeen, H. (2013) Validity, reliability, and potential bias of short forms of students' evaluation of teaching: The case of UAE University. *Educational Assessment 18,4, 235-250.*
- Dutt, B., & Rao, O. (2001) Empowering primary teacher with necessary competencies. *The Primary Teacher 26, 3, 32-38.*
- Dwivedi, S. (2012) Impact of pre-service teacher education programme on teaching competence. *Journal of Teacher Education and Research 7, 1, 96-109.*
- Gracious, F. L. (2011) The relationship between creativity and teaching competency of prospective B.Ed. teachers. *Turkish Journal of Distance Education 12, 1, 21-28.*
- Hall, G. E., & Jones, H. L. (1976) *Competency-Based Education: A Process for the Improvement of Education.* Prentice-Hall, Englewood Cliffs.
- Hart, J. W. (1934) *Teachers and Teaching.* Macmillan Press, New York.
- Himabindu, G. (2012) Teacher efficacy in relation to teaching competency. *International Journal of Multidisciplinary Educational Research 1, 4, 60-67.*

- Klaassen, C. A. (2002) Teacher pedagogical competence and sensibility. *Teaching & Teacher Education* 18, 151-158.
- Marsh, H. W., & Roche, L. A. (1997) Making student evaluations of teaching effectiveness: The critical issue of validity. *Bias and Utility* 52, 1187-1197.
- Mary, L., & Sundarajan, R. (2004) A study of teaching competency of science teachers at higher secondary level. *Journal of Educational Research and Extension* 41, 1, 13-23.
- Mohanty, A. K. (2006) Evaluation of teacher effectiveness through students ratings. *Edutrack* 5, 7, 5-8.
- Mukhopadhyay, M., & Nurula, M. (2000) *Secondary Education: The Challenges Ahead*. NIEPA, New Delhi.
- NCTE. (1998) *Competency Based and Commitment Oriented Teacher Education for Quality School Education*. Author, New Delhi.
- Padmanabhaiah, S., & P Bhagavan, D. (1994). Influence of some personality characteristics on student teachers. *The Progress of Education* 68, 8, 184-188.
- Passi, B. K., & Lalita, M. S. (1994) *General Teaching Competence Scale*. National Psychological Corporation, Agra.
- Richards, J. C., & Schmidt, R. (2002) *Dictionary of Language Teaching and Applied Linguistics*. Longman, London.
- Selvam, S. K. (2010) Teaching competency and job satisfaction among high school teachers: A Study. *Voice of Research* 1, 2, 16-20.
- Shanavaz, S. (2007) *A Comparative Study of Teachers' Competencies, Attitude and their Performance belonging to DPEP and Non DPEP District of Karnataka*. The University of Mysore, Mysore.
- Toland, M. D., & De Ayala, R. J. (2005) A multilevel factor analysis of students' evaluations of teaching. *Educational and Psychological Measurement* 65, 272-296.
- Tyagi, S. A. (2013) Study of teaching effectiveness of secondary school teachers in relation to their demographic characteristics. *International Journal of Engineering and Innovative Technology* 3 1, 288-295.

- Venkataiah, S. (2000) *Reconstructing of Teacher's Work, Teachers and Society. Encyclopedia of Education for 21 Century.* Anmol Publication, New Delhi.
- Walker, J. C. (1992) *A General Rationale and Conceptual Approach to the Application of Competency Based Standards to Teaching. Agenda Papers: Issues Arising from 'Australia's Teachers: An Agenda for the Next Decade 2.* NBEET Schools Council, Canberra ACT.

AUTHOR

Dr. Narayan Prasad Behera, Asst. Prof., Department Educational Psychology and Curriculum Studies, College of Education, The University of Dodoma, Po.Box-523, Dodoma, Tanzania
E-mail: tn.2366@yahoo.co.in

GUIDELINES FOR MANUSCRIPT SUBMISSION

Journal of All India Association for Educational Research is a peer reviewed journal. For anonymity in the reviewing process, paper title, name(s) of the author(s) and address for correspondence should be placed on a separate sheet. The first page of the manuscript should also include the title. Each manuscript must accompany the undertaking of the author(s) that the said manuscript has neither been sent to any other journal or to any other publisher. Three copies of the manuscript and a CD containing the manuscript, along with a declaration signed by all authors about originality and plagiarism check are to be sent to the Editor at the following address:

Sunil Behari Mohanty, Editor, JAJAER, Post: Sri Aurobindo Ashram, Puducherry-605 002. The manuscript should also be sent by e-mail to aiaer1987@gmail.com

An abstract of not more than 150 words should accompany each manuscript. New paragraphs should be indicated by clear indentation. Quoted passages longer than 3 lines should be indented throughout. There should not be endnotes and footnotes. Single foreign words and phrases should be italicised. All pages should be numbered. Tables and Figures should be avoided; if included, must not be included as part of the text. These have to be provided in separate sheets and the approximate position of tables and figures must be indicated in the manuscript. Tables should be numbered by Roman numerals and Figures by Arabic numerals. A manuscript should run between 20 and 50 pages in 12-point type and should not normally exceed 6,000 words. Manuscripts should be submitted as Word documents. Bibliographical references should be arranged alphabetically and should be given at the end of the text in the following format.

Book:

Das, M. (1999) Sri Aurobindo on Education. National Council for Teacher Education, New Delhi.

Book with Two or Three Authors

Joshi, K. & Artaud, Y. (1974) Explorations in Education. Sri Aurobindo Society, Pondicherry.

Book with More than Three Authors:

Bransford, J. D., et al. (2000) How People Learn: Brain, Mind, Experience and School (Expanded Edition). National Academic Press, New York.

A Commission Report:

Delors, J. (1996) (Chairman) Report of the International Commission on Education for the Twenty First Century. UNESCO, Paris.

Edited Book

Balasubramanian, P. S. & Punithakumar, V.E. (Eds.) (2003) Teacher Education in India- A Praxis Reader. St. Christopher's College of Education, Chennai & AIAER, Bhubaneswar.

A Chapter in an Edited Book:

Mohanty, S. B. (2012) Indian culture and learning. In Jarvis, P. & Watts, M. (Eds.), The Routledge International Handbook of Learning, 526-533. Routledge, Abingdon.

Articles:

Lomax, P. (1993) Management of training for education: an action research. Journal of All India Association for Educational Research 5, 2, 1-7, June.

(Titles of the journals should not be abbreviated)

Work by an Organisation

United Nations (1998) The United Nations Decade for Human Rights Education, 1995-2004 (UN Document HR/PUB/DECADE/1997/1). Author, New York.

Conference Paper

Petegem, P.V. (2009) Internal and external evaluation of schools: two sides of the coin called 'quality assurance of education. Key note address delivered at the Annual Conference of the All India Association for Educational Research, Lucknow, India, December 28-30.

IN-TEXT CITATIONS

In-text references should be mentioned in the in the text as: author, year of publication and page. Different categories are as follows:

Single author

(Chaturvedi 2006, p.67)

Two authors

(Rajmani & Dewasthalee 2009, p. 67)

More than three authors

While citing first time: (Miyam, Fernandes, Passi, Malhotra & Mishra 2009, p.54)

In subsequent citation: (Miyam et al. 2009, p.66)

Organisation as an author

According to the All India Association for Educational Research (1987, p.34)

Two or more works in the same Parentheses

(Priscilla 2009, p.67; Thilaka 2009, p.57)

Two or More Works by the same author in the same year

(Pradhan 2009 a, p.55) (Pradhan 2009b, p.43)

Authors with the same last name

(C. A. Rajasekar 2008, p.44; S. Rajasekar 2006, p.53)

EDITORIAL BOARD

1. *Prof. Chandrakant Bhogayata, Flat 1, Ground Floor, Hina Apartment, Behind Valiya College, Vidyanagar, BHAVNAGAR-364 002 Gujarat, India*
2. *Dr. Mohit Mohan Mohanty, 14 Kumar Complex, Kanika VIP Road, CUTTACK-753008 Odisha, India*
3. *Prof. Banabihari Mishra, Head, Dept. of Education, Mizoram University, Tanhril, AIZAWL - 796004 Mizoram, India*
4. *Prof. K. P. Subba Rao, Retd. Prof. Dept. of Education, Andhra University, VISAKHAPATNAM - 530003 Andhra Pradesh, India*
5. *Prof. Gouranga Chandra Nanda, Plot No. 25, Canal Road, Shanti Nagar, Jharpada, BHUBANESWAR – 751006 Odisha, India*
6. *Prof. (Mrs.) Jahitha Begum, HOD, Dept. of Education, Gandhigram Rural Institute, GANDHIGRAM - 624302 Tamil Nadu, India*
7. *Prof. V. Sudhakar, The English and Foreign Languages University, Tarnaka, HYDERABAD – 500007 Telangana,, India*
8. *Dr. D. K. Diwan, House No.200, Vikash Nagar, ROHTAK-124001 Haryana, India*
9. *Dr.DhrubaCharan Mishra, House No.4, Bivab Estate, Barmaunda Colony, BHUBANESWAR – 751 003 Odisha, India*
10. *Dr. P. Ravichandran, Dean, University College Fairview, Staff Apartment No: C-6.3, Jalan /27 D, Section 6, Wangsa Maju, 53300, Kuala Lumpur , Malaysia*
11. *Dr. Sylvia Christine Almeida, Sr. Lecturer, A 3.12 Faculty of Education, Monash University, Peninsula Campus, McMahons Road, FRANKSTON, VIC 3199 Australia*
12. *Dr. (Mrs.) Eva Esther Shalin, Provost and Business Leader, Marshalls University, ACCRA, Ghana*
13. *Dr. R. Kumar, 122 Masterman Road, LONDON E6 3NP, United Kingdom*
14. *Prof. Basanti D. Chakraborty, 267-08 77 Avenue, New Hyde Park, NEW YORK – 11040 United States*

Joint Editor

Dr. Rohan N. Meetei, Asst.Prof., Parambh School for Teacher Education, Model School Campus, JHAJJAR, Dt. Bahadurgarh – 124104 Haryana, India

Associate Editor

Prof. Bhujendra Nath Panda, Dean, Research, Regional Institute of Education, BHUBANESWAR-751 022 Odisha, India

Editor

Dr. Sunil Behari Mohanty, Flat 1, Beatitude Apartment 2, 61B Selvaraj Chettiar Street, Vaithikupam, PUDUCHERRY – 605 012,, India
Tel: 94436 01340(M) E-mail: aiaer1987@gmail.com

REVIEWERS

**JOURNAL OF ALL INDIA ASSOCIATION FOR EDUCATIONAL RESEARCH
IS EXTREMELY THANKFUL TO THE FOLLOWING REVIEWERS**

- DR. MINAKETAN PATHY, RETD. PRINCIPAL, DR. PM IASE, SAMBALPUR - 768 001 ODISHA
PROF. NETRANANDA PRADHAN, 107 SHARANAM SAPHIRE, 16 PRATPGANJ, VADODARA - 390
002 GUJARAT
PROF. (MS). PREMA KS RAO, # 1151, 'ANUGRAHA', BEML LAYOUT II STAGE,
RAJARAJESHWARI NAGAR, BOGADI, MYSORE- 570 033 KARNATAKA
PROF. SOHANVIR S. CHAUDHARY, A-104 WINTER HILLS, DWARAKA MOD, METRO PILLAR
#768, NEW DELHI 110 059 DELHI
PROF. BANABIHARI MISHRA, PUJARI PUT (SINGH COLONY), KORAPUT-764020 ODISHA
PROF. (MRS.) VIBHA JOSHI, SCHOOL OF EDUCATION, IGNOU, NEW DELHI - 110 068 DELHI
PROF. (MRS.) VEERA GUPTA, NIEPA, 17B SRI AUROBINDO MARG, NEW DELHI - 110016
DELHI
PROF. HARENDRA SINGH, PRINCIPAL/DIRECTOR, D. P. M. INSTITUTE OF EDUCATION,
BEHSUMA, MEERUT-250404 UTTAR PRADESH
PROF. (MRS.) S. K. BAWA, DEPT. OF EDUCATION, CENTRAL UNIVERSITY OF PUNJAB,
BATHINDA-151 001 PUNJAB
PROF. LOKANATH MISHRA, DEPT. OF EDUCATION, MIZORAM UNIVERSITY, AIZAWL - 796
004 MIZORAM
PROF. NIL RATTAN ROY, HEAD, DEPT. OF EDUCATION, TEJPUR UNIVERSITY, NAPPAM, DT.
SONITPUR- 784 028 ASSAM
PROF. VIJAY PALSINGH,, DEPT. OF EDUCATIONAL SURVEY NCERT, SRI AUROBINDO MARG,
NEW DELHI - 110016 DELHI
PROF. (MRS.) BHARTI DOGRA, SCHOOL OF EDUCATION, IGNOU, NEW DELHI- 110
068 DELHI
DR. (MRS.) S. FRANCISCA, 74 KRISHNANAGAR, N.G.O. 'A' COLONY, TIRUNELVELI -
627007 TAMIL NADU
PROF. SATISH RASTOGI, SERENE PARK, SERENE MEADOWS, 08 TH AVENUE, ANANDWALLI
AREA, CANAL SIDE ROAD, NASHIK-422013 MAHARASHTRA
DR. MS. N. KALAI ARASI, ASSO. PROF., N KT N COLLEGE OF EDUCATION FOR WOMEN,
CHENNAI-600 005. TAMIL NADU
DR. M. S. SARKARIA, ASSIT. DIR., SCERT, SIKHYA BHAWAN, PHASE 8, MOHALI -160062,
PUNJAB
DR. N. ROHEN MEETEL, ASSO. PROF., PRARAMB SCHOOL OF TEACHER EDUCATION, JHAJJAR,
HARYANA

UGC APPROVED LIST OF JOURNALS

Retrieved on May 7, 2019 from

[https://ugc.ac.in/journallist/subjectwise
jurnallist.aspx?eid=RWR1Y2F0aW9u](https://ugc.ac.in/journallist/subjectwise/jurnallist.aspx?eid=RWR1Y2F0aW9u)

Sl. No. 927/996 Journal No. 41312

Journal of All India Association for Educational Research

Publisher: All India Association for Educational Research

ISSN- 0970-9827

Registered with the Registrar of Newspapers of India
Registration No. 48247/89

| | |
|---|--|
| 1. Title of the journal | Journal of All India Association for Educational Research |
| 2. Registration No. | 48247/89 |
| 3. Language | English |
| 4. Periodicity | Half-yearly |
| 5. Retail selling price | Free for members of AIAER |
| 6. Publisher | Dr.DhrubaCharan Mishra Indian, Treasurer, AIAER, N 1/55 IRC Village, Bhubaneswar-15 |
| 7. Printer | -do- |
| 8. Editor | Dr. Sunil Behari Mohanty, Indian, President, AIAER, N 1/55 IRC Village, Bhubaneswar-15 |
| 9. True and precise account of the premises where printing is conducted | Creative Offset, N6/428 Nayapally, Bhubaneswar - 15 |
| 10. Place of publication | N1/55 IRC Village, Bhubaneswar - 15 |

Printed and Published by: Dr.Dhruba Charan Mishra, on behalf of
All India Association for Educational Research

Printed at Creative Offset: N6/4287, Nayapally, Bhubaneswar-15 and
Published at N 1/55, IRC Village, Bhubaneswar-15