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About the Journal

The *Journal of Indian Education* is a reviewed periodical published in May, August, November and February by the National Council of Educational Research and Training, New Delhi.

The NCERT encourages original and critical thinking in the area of school Education and Teacher Education. The JIE provides a forum for teachers, teacher educators, educational administrators and researchers through presentation of novel ideas, critical appraisals of contemporary educational problems and views and experiences on improved educational practices. Its aims include thought-provoking articles, challenging discussions, analysis, challenges of educational issues, book reviews and other related features.

The Journal reviews educational publications other than textbooks. Publishers are invited to send two copies of their latest publications for review.

The views expressed by individual authors are their own. They do not necessarily reflect the views of the NCERT or the views of the Editors.

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JOURNAL OF INDIAN EDUCATION

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CONTENTS

Editor's Note

While elaborating on the importance of Education, National Education Policy 2020 (NEP, 2020) has highlighted that 'Education must build character; enable learners to be ethical, rational, compassionate, and caring, while at the same time prepare them for gainful, fulfilling employment'. The policy emphasises the importance of developing social, ethical, and emotional capacities and dispositions among the future generation apart from cognitive capacities such as critical thinking and problem solving. Policy further emphasises the importance of using appropriate pedagogy in classroom, which is experiential, holistic, integrated, inquiry-driven, discovery-oriented, learner-centered, discussion-based, flexible, and enjoyable. The articles and research papers in the current issue of Journal of Indian Education (JIE) discusses some of these concerns, issues and recommendations mentioned in NEP, 2020 and endows with some pragmatic resolution for the progress of our education system.

The article 'Education that inspires Creating the Future of Human Education', by Cinderella Sequeira discussed the future of education, which is reduced to a well-marketed knowledge-certifying agency, rather than evolving students into authentic human beings, who can harmonise life, relationships, and societal goals, to contribute in the betterment of the world. The article concludes that there is a necessity to review the fundamental educational philosophy to ensure that we do not miss out on the nature and purpose of education. Through 'Extension Models of Marcia's Identity Status Paradigm', Manpreet Kaur has elucidated upon the nature and process of development of identity and shares a valuable insight on the extension model of identity status framework projecting on a wider scope and coverage of the subject beyond the typical boundaries of Marcia's identity status.

T. Lakshmanasamy has done an empirical analysis on the issue of gender bias and the effect of bargaining power on budget share of education in household expenditure, based on NSSO data on Bihar and Kerala. The study has shown significant gender gap in the budget share of education expenditure of households in rural and urban Bihar and Kerala.

In the article "Unemployment and Women Education", Sharmila Thingbaijam and Thaithiului Thaimei have presented the literacy and unemployment rate of the people of Ragailong Village of Imphal and studied the causes and effect of unemployment among women. The authors foregrounded that the educational and social status of the people of Ragailong village has improved a lot as compared to the past, and that the literacy and employment rate is high among them.

The role of principals as an academic and administrative leader has been emphasised in the NEP, 2020. The study by, Jyoti Pandey titled "A Study of

Leadership Behaviour of Secondary School Principals of Bareilly" reports the leadership behaviour of school principals that give directions to the school management system through interpretation of policy, allocation of resources, and relationships with the community. The study found a significant difference in the leadership behaviours of the principals, and focuses on six leadership domains such as emotional stability, group formation, productive tasks, skill development, social intelligence and value orientation.

The declining trend in the achievement of mathematics has been discussed by different policies and reports. G. Ravindra through his analytical paper has emphasised that mathematics should be taught the way mathematics is, and discussed some of the innovative methods of teaching mathematics at school level for ensuring quality and joyful learning of mathematics.

An empirical study by Nalini Patil and Pallavi Dalvi found that the direct teaching of thinking program improves communication and interpersonal relations of the student-teachers with their students and makes them confident in using the tools in their subject lesson. Soti Shivendra Chandra and Amit Sharma through their article "ENGNNOVATIONS (english-innovations) in Primary Education to make English Students' Favourite Subject", have attempted to scan, organise and present factors responsible for English phobia. The authors have suggested some engnnovations or english-innovations in the primary education to ameliorate English teaching and learning process, to make English students' favorite subject and eliminate English phobia. Shashank Shekhar and Achintya also have explained the different shades of meaning of verbs used in scientific writing through their article 'Functional Aspects of Verbs in Scientific Writing'. A. Kumar and Monika Negi through their research paper have highlighted that despite immense importance and globalised acceptance of necessity of knowledge of English language, the average Indian student is not able to learn or communicate in English with a reasonable level of proficiency.

Providing opportunity to the students to learn through experience has been advocated by NCF, 2005 and NEP, 2020 by recommending the use of experiential Pedagogy at all levels of school education. To what extend it has been implemented in the school curriculum is still under review. Through their research paper Rakesh Kumar and Moushmi Kumari tried to explore the development of creativity through activity-based practices among prospective teachers at secondary level from Bihar. In the paper "Metacognitive Awareness of Class XI Students in Relation to their Self-regulation", Amandeep Kaur and Navdeep Kaur have examined the metacognitive awareness of Class XI students in relation to their self-regulation. The findings of this study indicated a significant and positive relationship between self-regulation and the metacognitive awareness of students.

Through "Educational Status of Scheduled Tribes in Erstwhile State of Jammu and Kashmir— Contesting the Idea of Inclusion", Mohmad Saleem Jahangir, Shumaila, and Nadeem Ahmad Wani have argued that despite constitutional guarantees, scheduled tribes of Jammu and Kashmir lag behind in education as compared to the mainstream population. H. S. Mistry and S. C. Panigrahi through the paper "Teaching Aptitude of Pre-service Teachers Towards Inclusive Education— Construction and Standardisation of IETAT" found that participants had an average level of teaching aptitude towards inclusive education of students with disabilities. In the paper "From Academic Success to Mental Health— Everything is at Cost", Anil Kumar Teotia has studied the impact of Corona virus pandemic on academic, emotional, and mental domains of children, studying in government schools of North-East Delhi. The researcher has presented various concerns related to the closure of schools, and discussed how pandemic is a learning crisis for children, and argued that online classes result in anxiety, stress, and restlessness among students.

We expect that our readers would be able to relate their personal experiences with the issues and concerns discussed by the authors of these articles or research papers presented in the current issue. We invite our readers from different levels of school education and teacher education to contribute in the journal by sharing their knowledge in the form of articles, action research reports, theoretical papers, book reviews, etc. Your valuable suggestions and comments for improvement of the quality of the journal are welcome.

Academic Editor

Form IV *(See Rule 8)*

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I, Peyyeti Rajakumar, hereby declare that the particulars given above are true to the best of my knowledge and belief.

Publisher

Education that Inspires
Creating the Future of Human Education

Cinderella Sequeira*

Abstract

The aim of this paper is to visit the future of education, which is reduced to a well-marketed knowledge certifying agency rather than helping students of the future to evolve into authentic human beings harmonising life, relationships and societal goals, to create inspired learners who are propelled into contributing to the building of a better world. The ultimate teleology of education is the seeking of a harmonious goal of human education; the necessity is to provide an education that is oriented towards being more human, that aims to promote critical thinking and problem posing in education, that harmonises one's relationships with oneself, the other, planet earth as our common home and – in terms of the future – harmonious co-existence of humans and technology. Three important derailments in modern education will be dealt with, namely, (a) the lack of subjectivity and critical thinking in education, (b) the mechanical system of education and (c) the emphasis on the production of a marketable student. The paper concludes with the necessity of reviewing our fundamental educational philosophy in order to ensure that we, as a community do not miss out on the very nature and purpose of education.

Introduction

We are a country that believes in educating its populace. The best years of the youth of our country are entrusted into seemingly able and trusted hands to be nurtured, reared and educated. Thus, the responsibility of being accountable not just to the generations to come, but to our very selves must lead us to reconsider the fundamental question of the telos or goal of formal education in India. The aim of this paper is to establish that the ultimate teleology of education

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is the seeking of harmonious goal of human education (Gupta, 2005); the necessity is to provide an education that is not oriented towards perfection but is oriented towards being more human, that aims to promote critical thinking and problem posing in education, that harmonises one's relationships with oneself, the other, planet earth as our common home and – in terms of the future – harmonious co-existence of humans and technology.

In order to establish this claim as the end of education, the philosophical perspectives on education by the Brazilian educationist Paulo Freire and the contemporary German philosopher, Peter Sloterdijk have been extensively used. Using their arguments, an attempt has been made to point out certain drawbacks in the Indian formal education system so that the said goal of education can be achieved.

The Telos of the Human Person

In order to speak about the goal of education, we could begin by establishing the telos of humankind first. In light of the already existing philosophies, one remembers Aristotle's concept of Eudaimonia, the existentialists' 'search for meaning,' the educationist Paulo Freire's 'ontological goal of being human' and ancient and modern Indian philosophers who speak of '*Moksha*' as the end of life. These are some of the already established views of the teleological end of human life.

Building on these existing views, and in an attempt to re-visit them to make them relevant to our times, the teleological end of the human person, is to be as human as possible. Although this seems to be a mere re-phrasing of what has already been said, the greatest challenge of our times is to forgo the desire to minimise the void between 'what is' and 'what ought to be' and to focus on being as human as possible.

The 'ought' could be understood fundamentally as some sort of perfection, where, perfection could imply material precision or qualitatively superior morality (Aristotle, 1999) and spirituality. The former of these perfections has been and will be taken to greater heights by technological advancements such that artificial intelligence might take control over humans in the near future. The latter could probably be equated to be transcending the human realm. However, the path of spirituality and transcendence is the path chosen by a very limited number of people all over the world.

One of the greatest realisations in the context of the 21st century, given the technological precision around us, is that it is only in the context of technology we can expect some sort of perfection. At a human level (except through a spiritual path), the elimination of this gap is impossible. We probably owe this realisation to the ethical complexities of the present world where ethical issues can no longer be solved by

observing a moral exemplar, or by asking ethical questions to a guru. An ethical dilemma remains a dilemma even after one's decisions have been made. Therefore, there seems to be no possibility of perfection or perfect harmony. In fact, the whole discourse on harmony arises from the impossibility of the realisation of perfect harmony.

This leads us to a small but significant realisation—that since we are aware of perfection, there is the untamed human heart's desire to achieve perfection, to be as close to the 'ought' as possible. In the pursuit of perfection, one tends to forget to be human. Therefore, the very irony of the situation is that it is in giving up the idea of perfection that one comes close to perfection, where one pays more attention to the process than to the product. This, I believe, is the most important and challenging task – to create harmony out of chaos, to build relationships from brokenness and to sprout out social justice from an ethically barren society.

The quest for perfection is an illusion because, especially in a materialistic society, perfection is bound to be evasive and just around the corner. The quest for perfection has led humanity to pursue ruthless advancements in science and technology, which seems to appeal the human mind at the cost of the desire of the human heart to accept human fallibilities and place love above all other virtues. This quest for perfection has further led to the destruction of our planet, increased greed, pride and made human beings essentially inhuman.

The only manner in which some humanity can be restored into us is by letting go of the quest for any sort of perfection, which paradoxically is the only path to perfection.

The Telos of Education as a Facilitator of Being Human

The removal of the obsession with any sort of perfection leads one to the realisation that the goal of humanity is to be as human as possible (Vivekananda). One very important path through which human beings could achieve such a telos is through both formal and informal education. This paper, however, will contain itself to the formal education, without denying that, undoubtedly, informal education also has an equally, if not more, important role to play in the realisation of the said telos.

We need to revisit the telos of our formal education system, especially the Indian context, where the youth of the country seem to spend the best years of their lives receiving years of classroom education. There is a need to critically evaluate whether the teleological end of our education system seems to be obsessed with materialistic perfection, instead of developing a growing awareness of our own strengths and weaknesses and that of others, and realising that materialistic perfection is an illusive telos.

In this context, the Brazilian educationist Paulo Freire's

perspectives on education – which we will elaborate upon in the following section – proves to be very helpful to understand some significant lacunae in the Indian education system.

Understanding Paulo Freire's Banking Model of Education

Paulo Freire's banking model of education, explained in detail in his book *Pedagogy of the Oppressed*, is based on the oppressor-oppressed relationship that he underwent as a part of the colonisation experience in Brazil. Freire argued that just as the coloniser seeks to oppress the colonised based on the assumption that the coloniser is the all-knower and the colonised is an empty vessel which needs to be filled, similarly, the teacher is seen as the sole possessor of knowledge while the student is seen as empty 'containers' and 'receptacles' which have to be filled by the teacher. Thus, "the more completely she fills the receptacles, the better teacher she is. The more meekly the receptacles permit themselves to be filled, the better students they are." (Freire, 1970)

Education thus becomes an act of depositing, in which the students are the depositories and the teacher is the depositor. Instead of communicating, the teacher issues communiques and makes deposits which the students patiently receive, memorise, and repeat. This is the banking concept of education, in which the scope of action allowed to the students extends only as far as receiving, filing, and storing the deposits (Freire, 1970).

The students ought not to be filled in with facts which have to be memorised. The banking model of education prioritises the memorisation of facts instead of the applicability of those facts leading us to know what four times four is, but never understanding what it actually means to multiply four by four or what could be its implications. It is about knowing the capital of a state, but not knowing what it means for a place to be a capital and its relationship to the state (Freire, 1970).

This obsession with facts leads to two important issues. Firstly, it presents the teacher as the subject and the student as the object as pointed out by Freire who says, "For the oppressors, 'human beings' refers only to themselves; other people are "things" (Freire, 1970). The teacher is given great importance as the teacher seems to be the sole source of facts.

It follows logically from the banking notion of consciousness that the educator's role is to regulate the way the world enters into the students. The teacher's task is to organise a process which already occurs spontaneously, to fill the students by making deposits of information which they consider to constitute true knowledge (Freire, 1970).

The student is treated as a mere 'thing' who cannot have knowledge of anything more than facts, whose skills of the application of facts, critical thinking and problem solving would make the student aware of their state of oppression and the

nature of the oppressor which would lead them to revolution or demand to be treated as a subject.

Secondly, our present education system, seems to thrive on the illusion of making a 'perfect' student. It thrives on achieving perfection by making education objective, and as an objective evaluation presents us with the illusory guarantee of knowledge. This process of guaranteeing and certifying of the knowledge of a few facts has been mistaken to be the delivery of a sound education.

Freire however, has also received criticisms for his banking model of education due to the unclear terminology. Moreover, his philosophy has been misused by those who call themselves 'Freireans.' "In some cases, the use of Freire's name as a banner for support is mischievous or positively misleading. For example, teachers who describe themselves as "Freireans" simply because they encourage students to discuss ideas among themselves or allow the political issues of the day to become a subject for student projects unwittingly make a mockery of the depth of Freire's theory and practice." (Roberts, 2000).

We need to grow out of the illusion that education is meant to create perfect individuals, where getting your facts right is the point of education. Perfection, whether material, psychological or spiritual is not the ultimate end of education. We need to let go of the inclination of judging a student by their grades, instead, we could judge their quality of education by the person they have chosen to evolve into.

Moving from the Banking Model to the Democratic Model of Education

The primary concern of Freire was to shift the education system from the banking model to the democratic model of education, where, in Freire's words, Teachers and students (leadership and people), co-intent on reality, are both subjects, not only in the task of unveiling that reality, and thereby coming to know it critically, but in the task of re-creating that knowledge. As they attain this knowledge of reality through common reflection and action, they discover themselves as its permanent re-creators (Freire, 1970).

This is the presentation of both the teacher and the student as subjects who co-exist, co-learn and co-create. "As long as they live in the duality in which to be is to be like, and to be like is to be like the oppressor, this contribution is impossible." (Freire, 1970). Every teaching experience involves some form of a learning experience. It makes dialogue the norm of the day which harnesses critical thinking, problem-solving and the ability to recognise the strengths and weaknesses of the other and build on each other's arguments to come to the realisation of some truth.

They must abandon the educational goal of deposit-making and replace it with the posing of the

problems of human beings in their relations with the world. "Problem-posing" education, responding to the essence of consciousness—*intentionality*—rejects communiques and embodies communication (Freire, 1970).

Education, therefore, is not that which involves 'healthy' competition, but that which promotes whole-hearted cooperation not only between the teacher and the student but also between the individual and the society at large. Education is that which promotes "concern for humanisation [which] leads at once to the recognition of dehumanisation, not only as an ontological possibility but [also] as a historical reality (Freire, 1970). Education that promotes competition is education that prevents us from being more fully human, making education an act of oppression (Freire, 1970).

Prioritising the Process of Education and over its Product

Freire's democratic model of education essentially is his perspective of education without discrimination and oppression where the freedom to think critically is prioritised over the blind adherence to rules (Vivekananda). His focus is more on the process of education rather than the product of education. If the goal of education is to make us more human then, the process of education has to be molded accordingly. "Here, no one teaches another, nor is anyone self-taught. People teach each other, mediated by the world, by the cognizable objects which in banking education are "owned" by the teacher" (Freire, 1970).

Freire's expression of "mediated by the world" could be understood as the role that 'the world' which is a synthesis not just of cognisable objects, but also cognisable experiences – of one's life as a whole – which are often personified as one's greatest teacher. Thus, the dynamics within a teacher-student relationship is bridged by the role that 'life' plays.

The Role of Life in the Process of Education

Education needs to prepare us for life itself. This according to Freire is possible only in the democratic model of education, as otherwise, he says, Education is suffering from narration sickness. The teacher talks about reality as if it were motionless, static, compartmentalised, and predictable. Or else he expounds on a topic completely alien to the existential experience of the students (Freire, 1970).

By life the author means, the sum total of all of one's cognisable existential experiences. The necessity to give importance to one's ground reality which involves specific problems and experiences, which are practical, moral and ideological, which need to be prioritised in education. Therefore, not merely the application of knowledge, but the ability to synchronise knowledge with one's surrounding reality is

more important than the knowledge of facts.

Life plays the role of that adhesive which binds the process of education together. However, it is when life itself is limited to being only that adhesive bond of the process of education, it is then that education seems to devolve into the banking model of education.

The Process of Education as Prioritisation of one's Existential Experience

The extent to which one's existential experiences are given importance in education is the extent to which a student is ready not only to face challenges in the professional world, but is also ready to face challenges in one's life itself such as the ability to recover from a financial crises or a heartbreak, to live up to one's true potential, and to have the will and ability to pull oneself together from life's tragedies and to constructively contribute to society, to think critically of one's social and political decisions, to apologise when mistaken and build enduring relationships.

Re-evaluating the Teacher-student Relationship

The first step of prioritising existential experience is to place into perspective, the teacher-student relationship as it is the nature of this first relationship that will determine the manner in which the communication of knowledge will take place. As Freire says, "education must begin with the solution of the teacher-student contradiction, by reconciling the poles of the contradiction so that both are simultaneously teachers *and* students (Freire, 1970). Thus, when knowledge is on a one-way road to educating generations then, "the [so-called] "humanism" of the banking approach masks the effort to turn women and men into automatons—the very negation of their ontological vocation to be more fully human" (Freire, 1970). In the banking model of education, knowledge is no longer essentially a dialogue where both the teacher and the student mutually participate in the act of learning. "The students, alienated like the slave…, accept their ignorance as justifying the teacher's existence—but, unlike the slave, they never discover that they educate the teacher" (Freire, 1970).

The Teacher's Existential Reality

The second step is to ponder upon how do teachers learn to teach students? Especially in the case of higher education in the Indian context, a teacher does not undergo professional training in teaching. The actual art or skill of teaching, probably also applicable to lower levels of education is essentially an act of imitation or representation of the various teachers one has witnessed in one's life. In a banking model of education, where the teacher and the student are the oppressor and the oppressed respectively, the oppressed has a tendency to imitate the oppressor, or, as in the words of Freire, "adopt an attitude of adhesion to the oppressor"

(Freire, 1970) and "during the initial stage of their struggle the oppressed find in the oppressor their model of manhood" (Freire, 1970). If this is the case, then in a banking model of education, knowingly or unknowingly, both the student and the teacher are perpetuators of oppression and quoting Freire, 'bank-clerk teachers' serve only to dehumanise. (Freire, 1970).

Derailments in Modern Education

The following section of the paper addresses certain issues that exist within our present education system that pose a direct threat to a human goal of education. Some of these have already been elaborated by Peter Sloterdijk, a contemporary German philosopher, who, along the lines of Paulo Freire, repeatedly speaks of the significant pitfalls in modern education in his book *Critique of Cynical Reason*. Three important issues discussed here are as follows:

Lack of Subjectivity and Critical Thinking in Education

One of the important derailments in the education system is the extent to which it is limited to the knowing of facts and is not open to their interpretations. As mentioned earlier, it is the preoccupation with objectivity and objective assessments that prevents us from critical thinking.

The aversion to subjectivity probably arises due to the fear of lack of accuracy and precision. The onus then lies on the teacher who could guide their students to a more refined interpretation instead of merely repeating already established opinions. It is only when we are not afraid of subjective analysis and interpretation of facts, then we are not closed to radical or even jarring opinions that true rendition of education can take place.

In such a process of education, the teacher has an opportunity to learn from their students. The teacher evolves into a better learner and remains a learner for life.

The Mechanical System of Education

One of the major issues of modern education, according to Peter Sloterdijk, is its mechanical system where the student seems to be in the process of production through years of education only to be made 'marketable' in a seemingly enlightened age. Sloterdijk explicitly criticises the mechanical and commercialised system of education responsible for the creation of what he calls the "enlightened meaninglessness" of the modern society (Sloterdijk, 1987). A mechanical system of education where students are treated as automatons is essentially the banking model of education where the students have no choice to deviate from the set norms of what it means to be educated. As Sloterdijk says, "where "I" seem to be, others always went before me in order to automatise me through socialisation" (Sloterdijk, 1987). The confinement to a fixed

mode of years of education seems to be a system built to breed out the individuality out of the individual where "socialised human beings lost their freedom when their educators succeeded in instilling wishes, projects, and ambitions in them. These separate them from their inner time, which knows only the now, and draw them into expectations and memories" (Sloterdijk, 1987).

Our dreams, ambitions and our wishes are not about recognising and living out the humanness within us, we do not care for our common home, and in doing so, we are explicitly failing to be visionaries. Sloterdijk argues that we focus on the 'here and now,' being too tangled within the traditions of the past and the demands of the present. We also envision a similarly limited existence in the future for our children too (Sloterdijk, 1987) Thus, the element of automation in the process of education has to be broken and replaced by a system that promotes problem posing, critical thinking and prioritisation of the existential experiences in human beings so that, "Through appropriate education, care is taken in the future that innocent children are not made into the same artificial social cripples the previous system produced" (Sloterdijk, 1987). Although the elements of problem posing, critical thinking and subjectivity are present in our national education policies like the NCF, 2005 (National Curriculum Framework, 2005), the elements of automation continue as a part of our education system (Francis, 2019).

The Emphasis on the Production of a Marketable Student

The process of education has deviated far away from the aim of being and becoming more human to the extent that, to be educated has been reduced to literacy and acquirement of degrees. Only knowledge which can provide a living is worth knowing. Therefore, a third major derailment from a human-oriented education is the reduction of a student to being a product in a market that has commodified not only education but also, the human person.

Learning is separated cynically and instrumentally from its aims and is treated as a mere abstract certificate of qualifications. In some cases, the only thing that links study and occupation is salary, which is set according to the type of highest educational qualification achieved. The "substance" is degraded with cynical realism to a mere prelude, to academic chitchat. (Sloterdijk, 1987).

This "academic chitchat" is not merely the evasion of ground reality but is something even more dangerous, it is that which is mistaken to be the truth, mistaken to be worthy of mindlessly intense discussion of intellectual minds.

In such a system where knowledge is reduced to certifications and, where salary links study and occupation, one can be sure that the education system itself is oppressive and is

an oppressive tool to manipulate the masses, fueling a dehumanised education system and ensuring that people are automated into working for the oppressor.

The Future of Education – What do we Offer?

The human race is on the brink of taking its next great leap, i.e., the leap into the age of artificial intelligence (Wilson, 1987). In such an age, if education is a tool in the hands of a few used to oppress the masses, then, in the coming age of artificial intelligence, which could turn out to be the oppressor of oppressors, human beings may be tools in a world controlled by machines. The created will be greater than their creators and the well-being of machines will be prioritised over the well-being of humans. Therefore, the necessity to replace the penury of the humanness of education is more dire and relevant today, than ever before. The future of humanity will live in times where a human education will not only be what they deserve but might also prove to be salvific when faced with crises of survival in the face of technological advancements. Therefore, the telos of education requires a radical re-evaluation such that the process of education will promote subjectivity and will be far from a mechanical system. The focus will be on individuality and essentially human-centric for a harmonious existence with the technology of the future.

Conclusion

This paper poses several questions such as—what is the extent to which the said goal of education can be achieved? Can the process of education be differently structured? Can every form of curriculum prioritise critical thinking over facts? etc. These answers are beyond the scope of this paper. However, the centrality of existential experiences, the focus on growing into a better individual and the change in perception from competition to cooperation will prove education to be a paradigm shift for a harmonious existence of human beings vis-à-vis technology.

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Extension Models of Marcia's Identity Status Paradigm

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Abstract

Within the field of psychology, the nature and the process of development of identity and other related concepts like self and self-identity have attracted many researchers over decades. Studies began with Freud's early writings and they were popularised by Erikson's (1950, 1968) theoretical expositions. The work of Marcia (1966, 1980) was the first neo-Eriksonian identity model that operationalises Erikson's work. Both Cote and Levine (1988) and van Hoof (1999) construed identity status model as an excessively narrow conceptualisation of identity and called for the extension as well as expansion of identity status model. Consequently, a number of alternative models of identity have begun to come forth since 1987. The alternative identity models are divided into two categories: The extension models and the expansion models. Extension models are those models that largely complement identity status paradigm model rather than diverging from it or reconceptualising it. Expansion models are those models that may include identity status framework as a component, but go far beyond Marcia's identity status paradigm in their scope and coverage. Using these definitions, in the current paper extension models proposed by Berzonsky (1989a), Grotevant (1987; with extensions by Kerpelman, Pittman, and Lamke, 1997), and Waterman (1990) have been discussed.

Who am I?
What are my values and goals?
What is my life's purpose?
What makes me different from other people?

Am I really the same person from one year, or decade, to the next?

(Schwartz, 2001)

These questions proposed by Schwartz (2001) illustrate those aspects

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of self-knowledge which are needed to form a healthy sense of identity. He describes these aspects as forming a roadmap in the development of human that ultimately gives meaning and understanding to an individual's life. The main function of identity is to provide a sense of direction in one's life. Both of these theorists based their ideas on Erikson's theory (1950, 1968), whom some consider as the father of identity conceptualisation theories. He believed that individuals move in life through various stages of psycho-social development, and one needs to complete certain psychosocial tasks at each stage-identity formation being one of them in the adolescence stage of development.

Although identity is not defined uniformly, generally we understand identity as being aware of oneself, his uniqueness, and authenticity. Erikson (1950) defined identity as, "the accrued confidence [in] the inner sameness and continuity of one's meaning for others." In this definition three important elements emerge as necessary for identity: first, the individual must experience the inner sameness or integrity, so that actions and decisions are not random. Defined principles and values order one's behaviour and a deviation is perceived as 'not me'; second, the sense of inner sameness is continuous over time. Actions in the past and hopes for future are experienced as related to the self of today. Third, identity is experienced within a community of important others.

According to Grotevant (1998), identity refers to the way one defines themself and the way one is recognised by other persons and to one's subjective sense of the coherence of personality and continuity over time. Bosma (1995) and Kroger (2007) viewed identity as the dynamic balance between sameness and change, and balance between subjective and objective perspective. Louw and Kail (2007) define identity as "the way a person identifies him or herself in relation to other individuals and social groups". A narrative approach in investigating identity has developed in more recent times. It has been described as the internalised storied reconstruction of one's perceptions of the past and the future towards building a sense of unity and purpose for one's life (McAdams and Cox, 2010). Schwartz et al., (2011) gave an operational definition of identity comprising of one's "chosen commitments, personal characteristics, beliefs about oneself, roles and position in relation to others, membership in social groups and categories, treasured material possessions and where one belongs in a geographical space". Though, the concept of identity has been explained by various theorists, every work generating out of Erikson's (1968) conceptualisation of identity, provides a satisfactory and reasonable explanation of identity.

Erikson's Conceptualisation of Identity

Erikson (1968) provided the most widely accepted framework for

conceptualising the transformation of self during the period of adolescence. This framework is for the development of a sense of one's individuality (i.e., self-sameness) and continuity with significant others over time. Erikson (1968) described identity as "a progressive continuity between that which one comes to be during the long years of childhood and that which one promises to become in the anticipated future: between that which one conceives oneself to be and that which one perceives others to see him and to expect from him." In these lines, he described ego identity as performing a variety of functions like, sameness over time, inner coherence, the synthesis of successive identifications, and protection against experiences of sudden discontinuities that may occur by biological development or changes in various situations of life. He believed that formation of identity in adolescent period can be achieved in the form of "a coherent sense of one's roles and occupational pathway, one's self in relation to others, and one's values and purpose in life, whereas failure resulted in confusion within these self-aspects" (La Guardia, 2009).

According to Erikson (1968), identity is on the pole of a dimension relating to self-knowledge, and it is extended to opposite pole of identity confusion. He viewed the formation of identity as a major component which evolves in childhood and its development continues throughout the life cycle and he viewed the processes of introjections, identification and identity formation as the steps by which ego develops. Introjection refers to the incorporation of another's image which is based on experience (satisfactory) of mutuality in relationships during early years. Identifications means when the child becomes like those other significant persons with features that are admired. Whereas, according to Erikson (1968), identity formation begins only after the process of seeking identifications as the basis of one's identity ends.

According to Erikson (1968), the effective resolution of the process of identity formation results into the formation of coherent ego identity, that is characterised by a stable, clear self-definition that includes an inner continuity in values, beliefs, attitudes, and interests. Erikson's (1968) concept of identity is multidimensional in nature and has a wider scope. Erikson's (1968) work spoke of different aspects of identity like cognitive, social, cultural and moral. His main purpose was to establish a developmental-social approach of the self-covering all levels from the intra-psychic ego conflicts to different cultural and historical contexts enclosing the individual. Erikson (1968) pioneered the work of identity, but it has its roots in psychoanalytical theory that emphasises the driving mechanism of formation of identity in the form of conflicts and its resolutions (Blos,

1962). Hence, Erikson's (1968) view about the identity is in primary, theoretical and clinical terms. He provides a framework for identity, from which different other researchers attempted to operationalise its components.

Marcia's Operationalisation of the Concept of Identity

Marcia's work (1966, 1980) was the first identity model that operationalised Erikson's concept of identity. Ego identity can be defined as "an internal, self-constructed, dynamic organisation of drives, abilities, beliefs and individual history" (Marcia, 1980). Marcia (1966) presented a status paradigm model intended to represent Erikson's theory by emphasising on personal identity. From Erikson's writing, Marcia (1980) inferred two independent dimensions of—

- Exploration
- Commitment

Exploration

It involves active questioning and consideration of different options or alternatives available. It is a process which is used by individuals so as to search for the resolutions of different issues of changing goals, beliefs about the world before actually being committed to any alternative.

Commitment

It pertains to the process of adherence to a specific set of values, norms, goals and beliefs (Marcia, 1980). A commitment showed the existence of a choice made from different options in any given domain of occupation, religion and politics, etc., (Marcia, 1980). Commitment involves the degree to which a person have explored different experiences of life and made a commitment to ideological sense of his self.

By bifurcating the dimensions of exploration and commitment into high and low levels, Marcia (1966) derived four independent identity statuses, these are—

(i) Identity Achievement Status

(ii) Identity Moratorium Status

(iii) Identity Foreclosure Status

(iv) Identity Diffusion Status

Each status of identity represents a combination of exploration and commitment levels.

Identity Achievement Status

Marcia (1966) originally considered and labelled the identity achieved status as the final state of the identity formation process. This status is characterised by high commitment following high exploration. Achievement is considered as the most mature state of identity because it is linked with strong interpersonal relationships, balanced thinking ability and effective decision-making capability. Identity achievers are considered as the 'balancers' of work, relationships and interests. The identity achieved individual is one who has gone through the process of

active exploration and has selected one or more options to adhere.

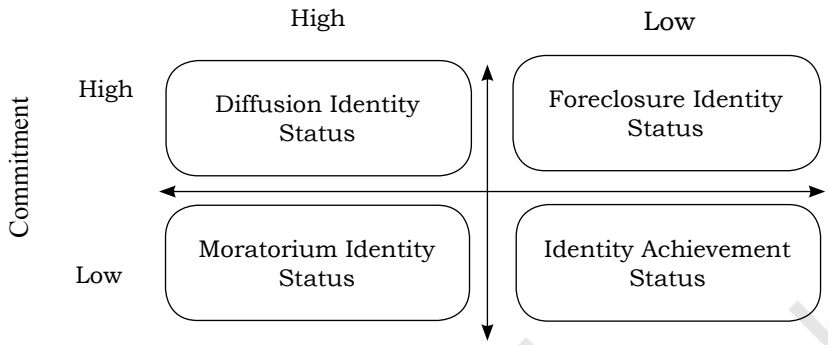

Figure 1: Marcia's Identity Status Paradigm (1966)

Identity Moratorium Status

Identity moratorium status is the state of active exploration in the relative low commitment or absence of commitment. Kidwell et al., (1995) proposed that the moratorium status may be linked with storm and stress, consequently, individuals tend to remain for less time in this moratorium state as compared to other statuses of identity. Individuals in this status are labelled as 'daughters of crisis'. Individuals in this status experience crisis because of the active exploration of various alternatives, but have not yet chosen any alternative.

Identity Foreclosure Status

Identity foreclosure status is characterised by making commitments to a particular set of beliefs, norms, values and standards without any active exploration. Foreclosure status individuals are 'culture bearers', i.e., they maintain the commitments reflected by their parents and society. Generally, foreclosure status of identity is associated with some degree of closed-mindedness, rigidity and self-satisfaction as mentioned by Marcia (1980). Marcia (1966) mentioned that the individuals who are in foreclosure status of identity tend to be authoritarian and they show conflict-free as well as smooth relationships with their parents as compared to the individuals of other statuses.

Identity Diffusion Status

Identity diffusion status is the state that is characterised by the relative lack of both exploration and commitment. Diffused identity status individuals are generally apathetic and disinterested (Marcia, 1980). Berzonsky (1989a) mentioned that the individuals of diffused identity status are often at high risk for a number of maladaptive outcomes, like academic problems and drug problems. So, individuals in diffusion status are labelled as 'apathetic wanderers'. In general terms, identity

diffusion is basically a lack of basic identity structure which might hold the person together and afford that person a solid basis in choosing different paths of life.

The identity status paradigm appears to be better characterised as character types than the developmental stages given by Erikson (Cote and Levine, 1988; Grotevant, 1987). The controversy exists about which status out of moratorium and foreclosure should be placed next to identity achievement status on the continuum of identity status. Marcia (1966, 1980) himself admitted that the identity statuses somehow deviated from the concept of identity given by Erikson, and this identity status model focused mainly on personal identity. Numerous theorists (Cote and Levine, 1988; Meeus, 1996; Meeus et al., 1999; Waterman, 1982) have also questioned the conceivable nature of the identity status paradigm model as a developmental theory. As addressed by these researchers, the specific weaknesses of the identity status model are cross-cultural validity (the failure of these four statuses to differentially relate to comparison variables), and the use of distinct status categories so as to represent identity.

Both Cote and Levine (1988) and van Hoof (1999) construed identity status model as an excessively narrow conceptualisation of identity and called for the extension as well as expansion of identity status model. Consequently, a number of alternative models of identity have begun to come forth since 1987. The alternative identity models are divided into two categories— the extension models and the expansion models. Extension models are those models that largely complement identity status paradigm model rather than diverging from it or reconceptualising it. Expansion models are those models that may include identity status framework as a component but go far beyond Marcia's identity status paradigm in their scope and coverage. Using these definitions, extension models have been proposed by Berzonsky (1989a), Grotevant (1987; with extensions by Kerpelman, Pittman, and Lamke, 1997), and Waterman (1990).

Extension Models of Marcia's Identity Status Paradigm

The different extension models given by different theorists are fairly divergent from one another. Grotevant (1987), established an in-depth examination of the exploration process. Berzonsky (1989a) proposed an individual differences perspective on identity formation, which is based on people's preferable methods of solving different problems and making decisions. Waterman (1990), added a new dimension of self-discovery to the identity status approach.

Berzonsky's Socio-Cognitive Model of Identity

Berzonsky (1989a) has stressed the importance of considering the process of identity development in

addition to its structure. He said that by focusing on only one aspect of identity, i.e., statuses as an operationalisation of structure, some of the complexity of identity is lost. Berzonsky (1989a, 1990) proposed an individual differences perspective on identity formation, which is based on people's preferable methods of solving various problems and making decisions related to different issues of self. Berzonsky (1989a, 1990) has propagated a process-oriented paradigm of identity formation that is based on a constructivist theoretical perspective. The identity processing styles that are displayed by the individuals are actually their chosen preferences.

Three identity processing styles proposed by Berzonsky are:

(i) Informational Identity Processing Style

(ii) Normative Identity Processing Style

(iii) Diffuse-Avoidant Identity Processing Style

Informational Identity Processing Style

The informational identity processing style represents deliberately seeking-out, processing and evaluating their identity related information. The individuals using informational identity processing styles are self-explorers, means these individuals are more open to new ideas and are willing to suspend their judgements related to their own self. They function as scientific self-theorists, who are keen to learn new things about themselves and to find accurate self-diagnostic information. They are considered as rational agents who seek rational, informed explanations and reasons for the choices they make and actions committed by them.

Normative Identity Processing Style

The normative identity processing style represents imitation and conformity. The individuals using normative identity processing styles are conformed to standards, value patterns, directions and prescriptions of other significant persons in an automatic manner. It means they make premature commitments without critically evaluating the informwation. They show a low tolerance for ambiguity and have a high need to maintain structure and cognitive closure (Berzonsky, 1990). Individuals who use this protectionist approach function as dogmatic self-theorists, whose main objective is to conserve and maintain self-views, and to guard their self against the information that may threaten their 'hard core' values and beliefs.

Diffuse-Avoidant Identity Processing Style

A diffuse-avoidant identity processing style involves a reluctance to confront and deal with identity related conflicts and issues. If anindividual procrastinates too long, then their actions and choices will be decided by situational demands and consequences.

Such context-sensitive adjustments are more likely to involve ephemeral acts of verbal or behavioural compliance rather than stable, long-term revisions in the self-theory. This identity processing style is postulated to be linked with diffused identity status given by Marcia. Individuals with a diffuse-avoidant identity processing style adopt an unplanned, situation-specific approach to self-theorising, which leads to a fragmented set of self-constructs with limited overall unity (Berzonsky, 1990).

The three identity processing styles add a process component to the Marcia's identity status paradigm framework (Berzonsky, 1990; Berzonsky and Adams, 1999). Berzonsky's (1989a, 1990) processing style approach is more closer to the Erikson's ego synthesis angle that reflects more of an ongoing process than a stationary event. The greater level of continuity inherent in identity processing style makes this construct more closer to Erikson's (1966) notion of continuity of character than the identity status approach.

Grotevant Model: Exploration As The Work of Identity Formation

Grotevant (1987) proposed a process model of identity formation. He referred to exploration as "the work of the identity exploration process". By this view, he opined that exploration was the process variable within Marcia's model of identity status paradigm, and with commitment is an outcome index (Bosma, 1992). Therefore, he designated the process of exploration as the phenomenon behind development identity. Grotevant's main emphasis was on exploring the components, antecedents, and concurrents of exploration. Two principal components of identity exploration were discovered by Grotevant (1987). He postulated that exploration was a function of "those abilities and orientations that individuals bring to bear on the identity formation process". The abilities were assumed to be skills like problem solving, perspective taking, and critical thinking. Orientations referred to attitudinal factors like rigidity and procrastination that will determine the willingness or unwillingness of a person to involve in the process of exploration. Grotevant assumed that abilities and orientations are two independent components of exploration, it means, the presence or absence of one component will not affect the presence or absence of the other component.

A two-by-two matrix can be framed by taking on the x-axis, the presence or absence of abilities and on the y-axis, the favourability or unfavourability of one's orientations toward exploration. The condition having the presence of critical skills and favourable orientations would be best conducive for promoting exploration, in comparison to the condition having only the presence of critical skills or favourable orientations.

According to Grotevant, 1987 both the problem-solving skills and orientations make separate contributions in promoting the

exploration, and for the greatest degree of exploration to occur, both components need to be present. To identify two principal components of identity exploration, Grotevant (1987) discovered five antecedents to the process of exploration, these are: (a) information-seeking tendency, (b) the presence or absence of competing forces in the life of a person, (c) satisfaction or dissatisfaction with one's current identity, (d) expectations for the exploration process, and (e) willingness to explore. Each of these components contributes in identity exploration. Once exploration has started, the various antecedent factors continue to guide, affect and even stop the process (Kerpelman et al., 1997). After an initial period of exploration, individuals can often stop to reflect on the process and decide how or if it should continue. For example, if, after a brief period of exploration, one is satisfied with the identity that one has created, one is more likely to stop exploring (Grotevant, 1987). However, a continued orientation to exploration, without satisfying the current sense of identity, can lead to new searches for identity after re-evaluation. These reassessments are crucial to the exploration process, as they represent changes in the course of exploration prescribed by changes in circumstances, the growth of the individual, or any other new information (Grotevant, 1987).

Out of the five proposed antecedents of exploration, seeking information, expectations and willingness to explore would be expected to facilitate the exploration process, while satisfaction with the level of identity and interfering factors are expected to hamper exploration. Information gathering has proven to be an important aspect of exploration (Marcia, 1966, 1980; Waterman, 1982, 1993). Berzonsky's style of information processing based on the active search for information has been found to be linked to exploration (Schwartz, 2006). It is theoretically credible that expectations regarding the exploration process affect the intensity and results of the process. This means that a person who expects to solve problems through the exploration process would be more likely to have a better chance of doing so than one who does not expect to solve his problems. However, there is no empirical study to support this proposition. Willingness to explore has not been directly found to precede exploration, but rather reluctance to explore, particularly Berzonsky's normative identity processing style has been found to inhibit identity exploration (Schwartz, 2006), and the use of the normative identity processing style has been found to suppress the relationship between problem-solving skills and exploration (Berman et al., 2001).

In addition, with respect to competing factors, a person who has a large number of current commitments is likely to be in foreclosure status or identity achieved statuses. The foreclosure and identity achieved

statuses have been shown to be less likely to involve solving critical problems than the diffuse identity and moratorium statutes (Berman et al., 2001). People in foreclosure are not likely to explore unless they are forced out of their comfort zone (Marcia, 1995). Individuals, who have achieved their identity, even if they tend to use the information processing style, are unlikely to explore significantly due to less use of problem-solving skills, which means they have already found what they were looking for (Marcia, 1994). It also shows that once a person has explored enough to reach the status of identity achievement, they stop exploring (Grotevant, 1992).

Identity Control Theory as an Extension of Grotevant's Process Model of Identity

The process-based identity model of Grotevant (1987) clarifies the elements that make up and guide the exploration process and provides for repeated re-evaluations of this process, but it "does not specify the proximal causes of continuous exploration" (Kerpelman et al., 1997. In addition, the criteria for periodic re-evaluations of exploration and emerging identity are mentioned in the Grotevant model, but specific events that facilitate or inhibit exploration on a weekly and daily basis are not mentioned. Control theory has been introduced in identity literature in order to identify the microprocesses that stimulate or inhibit exploration and development of identity. He proposed, with emphasis on reciprocal causality and mutual influence, that singular interpersonal interactions and their intrapsychic consequences drive exploration and identity development (Kerpelman and Lamke, 1997; Kerpelman et al., 1997). In simple terms, we can say that the constant and continuous interactions between the developing identity of the adolescent and his social environment, and more particularly the congruence or incongruence between the identity of his ego, his personal identity or his social identity and the comments we receive regarding aspects of identity, are said to drive or inhibit the process of exploration. If the vision one has of oneself is consistent with the comments received from a person, exploration is unlikely to happen. On the other hand, if the feedback a person receives from important people is not incompatible with one's identity, then exploration is likely to occur.

Grotevant (1997) supported this revision and extension of its process model, stating that the methodological and conceptual approaches advised should "move the field forward". Berzonsky (1994) proposed adding an aspect of individual differences to the theory of identity control, which was integrated by Kerpelman et al., (1997) in a revised version of the model. Simply put, an informational style using individuals should be more open to comments that do not match their identity. The normative style

using individuals must be closed to such comments and seek only those which correspond to their identity (Nurmi et al., 1997). The diffuse-avoiding style using individuals should be heedless of any feedback offered to it. Identity control theory is proposed primarily in the context of interpersonal relationships, although feedback refers to any domain of identity content, namely ego-personal, social-structural, personal-social or all of these models.

Adams and Marshall (1996) pointed out two main shortcomings of this approach: first, the theory of identity control does not specify the origins of the initial identity. Kerpelman et al., (1997) have stated that this initial identity finds its origin through parental introjects as well as identifying mechanisms or according to the concept of attachment theory according to which the initial self is formed by a parental mirror (Bowlby, 1980). The second criticism concerning the reciprocal causal nature of the theory of control and this reciprocal causality could suggest a mechanistic-contextualist vision of human development which is incompatible with the orientation based on the choice of the Eriksonian tradition. Kerpelman et al., (1997) placed the theory of control completely in the contextual world view. It is important to note that the behavioural model, which emphasises the choice and the ability of individuals to guide their own life path, is placed in the contextual worldview. Reciprocal determinism does not seem to authorise self-direction. Identity control theory has therefore been criticised on this issue.

Waterman: The Personal Expressiveness Construct

Waterman (1990) found that even in the same identity status, there is great variability in the quality of exploration in which individuals are engaged and the commitments they have made. Individuals who achieved their identity tended to group themselves into two broad general categories—the first category included individuals who derived a high degree of personal significance from the different identity alternatives they had explored and committed to. The second category included individuals whose goals, values and beliefs appeared to have been more externally motivated, although they had sorted out a number of different options and selected one or more to engage (Waterman, 1992).

According to Waterman, the personal meaningfulness dimension did not apply to persons who were in moratorium and foreclosure identity statutes to the extent that it was to those who had achieved identity status. He hypothesised that this was due to the limited number of alternatives or options explored in the foreclosure status and the incomplete nature of the personal identity inherent in the identity status of the moratorium. Individuals with a diffuse identity had not explored or made any commitments, the personal meaningfulness

dimension did not seem to apply at all to individuals with diffuse identity status. Waterman (1990) named this personal meaningfulness dimension as personal expressiveness. Waterman (1990, 1992) defined personal expressiveness as the feelings of an optimal experience which accompany the discovery of its daimon or its best potentials and the participation in activities which reflect the daimon. According to Aristotle's tradition, personal expressiveness stems from a "theory of ethics, calling on people to recognise and live in accordance with their daimon" (Waterman, 1992, p. 58). It is considered a form of happiness, personal expressiveness extends beyond pure enjoyment as it involves a sense of purpose, direction and accomplishment. Personal expressiveness not only implies happiness and pleasure, but it also implies an intense sense of personal direction in a person's life.

Because the statuses of foreclosure, moratorium and identity achieved have been found in both expressive and instrumental (not personally expressive) variants (Waterman, 1999). In light of this, personal expressiveness can be considered as a third dimension of identity development with exploration and engagement (Waterman, 1992). Personally expressive individuals are classified more in identity achieved status than in one of the other three statuses, the presence of exploration as well as engagement alone does not provide any kind of guarantee that the personal identity formed will be personally expressive. However, the absence of exploration and commitment (the diffuse status) guarantees that the personal identity of the individual will not be personally expressive. You have to have a reasonable idea of the best potentials before you can identify various identity alternatives that can be personally expressive (Waterman, 1992).

There are a number of reasons why individuals explore and engage in instrumental identity alternatives. Waterman (1992) discovered four reasons why individuals explore and engage in instrumental identity alternatives: first, their environment can limit the range of prospective choices. Second, competing social factors may force individuals to make choices that are more socially acceptable rather than seeking their inner potential. Third, a person can be distracted by pleasures incompatible with the pursuit of their unique excellences or goals (Waterman, 1992). Fourth, one can refuse the possibility of pursuing one's optimal self because of the potential difficulties involved in identifying and realising one's inner potentials (Waterman, 1992). Like Grotevant's (1987) process model, personal expressiveness is an additional component of the identity status paradigm model (Waterman, 1992). The difference between the goals, beliefs and values that resonate with the true and original self and those chosen for other reasons provides insight into the search for

identity. The personal expressiveness versus instrumentalism dimension can help clarify the motivations of individuals to explore and engage in a given set of ideals.

Personal expressiveness is supposed to come entirely from personal identity. On the other hand, the daimon, on which various activities of personal expression are based, is a component of the identity of the ego. Living a daimon-like life represents continuity of personal character, means that an individual's decisions and behaviours are likely to become more and more stable and consistent as they become more familiar with their daimon (Waterman, 1992). From Erikson's point of view, the identity of the ego represents the heart of the self. In terms of status as the most basic aspect of self and its unconscious nature, the identity of the ego seems to closely match the daimon.

Educational Implications

The present study can have practical implications for young people in their adolescent years. The research can serve as a framework for development of identity enhancement programs for adolescents. Under this program it is recommended that the quality of educational experiences should be improved so as to contribute in making adolescents' sense about their 'self.' It is suggestive that the schools, teachers and parents should become proactive in supporting and creating congenial learning atmosphere in the school as well as home context that should provide opportunities and experiences that are sensitive to processing systems and identity processing styles. Adolescents should be provided opportunities that promote active engagement in real life experiences that they can incorporate into their understanding of the sense of 'who they are?' Hence, the curricular and co-curricular activities should be aimed at promoting adolescents' sense about their 'self.'

Conclusion

A critical analysis of all these models suggests that there are structural and process components involved in identity. Structurally, identity can be meaningfully organised into different domains—general, physical, psychological, social, and spiritual. Identity formation also involves dynamic processes because identity evolves along with person's development throughout their life span. Identity is dependent on extra personal factors like environmental changes, life experiences and intrapersonal identity processes including exploration, commitment, and reconsideration. There is also evidence that other variables like gender, age, and culture patterns at different times affect the identity development. The specific weaknesses of the identity status model include the cross-cultural validity (the failure of these four statuses to differentially relate to comparison variables), and the use of distinct status categories so as to represent identity.

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Gender Bias in Household Educational Expenditure

An Econometric Analysis of Bargaining and Budget Share

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Abstract

The gender bias in education and household education expenditure is analysed, and the effect of parental bargaining power on the budget share of education in the household expenditure is examined using the 68th round (2011-2012) of NSSO data on Bihar and Kerala. The collective household model and Three Stage Least Square estimation approaches are used. The 3SLS estimates show a significant gender gap in education in rural and urban Bihar and Kerala, but not much difference in the gender allocation patterns of households in the two states. Though urban households allocate more resources for education, gender disparity is more in urban households relative to rural households. The household budget share on education increases with an increase in the proportion of boys than girls. The male bargaining power has some effect on the budget share of household education expenditure in urban households, but not in rural households of Bihar and Kerala.

INTRODUCTION

In the post-independence 1951 Census of India, the literacy rates of females and males were only 9 per cent and 27 per cent respectively and the corresponding rates were 39.3 per cent and 64.1 per cent in the 1991 Census. With economic reforms of 1991, there has been increased public attention on the benefits of schooling and the feasibility of private participation, and government policies have been revitalised to improve the supply side

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and incentivise households to enroll children in schools. Also, significant efforts have been made to promote female schooling which is important for reducing the gender differential in literacy rates. With the Sarva Shiksha Abhiyan and Education For All educational programmes, the proportion of out of school children fell from 66 per cent in 2005 to 3.5 per cent in 2010 for children between the ages of 6 and 14 in rural India. Though there have been dramatic changes in enrollments, there remains an acute shortfall in terms of infrastructure and quality in government schools which necessitates further action by the government to improve the education system in India.

While the mean years of schooling have grown noticeably across successive generations, for both men and women, in both rural and urban areas, gender gaps in education have also increased. The most significant educational gains have been among urban females; in rural areas, mean years of schooling grew at comparable rates for both men and women. A 2001 World Bank report in a study of 41 countries that the ratio of boys to girls enrolled in secondary school is 40 per cent for poorest countries and 20 per cent for rich countries. According to the 2001 Census of India, "the gender gap in literacy ranges from 24.6 per cent in rural India and 13.4 per cent in urban India. In the northern part of India, literacy rates vary from 27.7 per cent from rural Bihar and 17.5 per cent in urban Bihar, whereas in Uttar Pradesh figures are 30.3 per cent in rural areas and 16.1 per cent for urban areas. In the southern states of India like Kerala, the literacy gap between the rural and urban areas is much less compared to other states of India, standing at 6.7 per cent for the rural areas and 5.2 per cent for the urban areas".

The issue of gender bias against girls within the household is particularly important in the Indian context as there exists widespread social sanction for son preference and skewed property rights. But it is difficult to observe the inner working of the household allocation mechanism due to a lack of data. The best way to gauge the extent of gender bias against girls within households is to look at the issue by using external observable outcomes like education expenditure on children by the household. A general approach is to understand the budget share of education expenditure in the household expenditure with respect to the gender composition of the household. It tests the significance of gender differential between the marginal impact of boy and girl child on the expenditure share of education in the budget share of the household. This can be stated that if one replaces a girl child in the particular age group with a boy in that same age group, then the extent to which expenditure share of education changes gives a measure of gender bias in the household allocation of resources.

The main objectives of this paper are to examine the nature and existence of gender bias in the household allocation of resources to the education of children and to analyse the effects of the bargaining power of the parents on the budget share of educational expenditure. This paper follows the collective household model and applies the Three Stage Least Square (3SLS) estimation method on the 68th round NSSO (2011–2012) data on Kerala and Bihar. The empirical methodology for testing gender bias is to test the difference between the expenditure share of education in the household budget associated with an addition of a boy and a girl child in the household. The approach of Basu (2006) is followed for testing whether the earnings of the household head is a true measure of the bargaining power of the head within the household, and whether the household head has an effect on the budget share of education in the household expenditure.

Review of Literature

Studies by Bardhan (1974) and Das Gupta (1987) that examine gender bias and bargaining power of household members over allocation of resources for education within the household clearly show evidence of discrimination against females in India, although the explanations put forward by the two authors are quite different. The problem of detecting gender bias at the household level comes from two kinds of limitations: lack of data on consumption at the individual level, and the fact that the differential allocations among boys and girls might be compensatory, so that no real discrimination exists in the household resource allocation. Deaton (1989) proposes an outlay equivalent/adult good approach to detect gender bias at the household level.

Deaton (1989) does not find any evidence of a significant level of gender bias in Cote d' Ivoire, but find evidence for some gender discrimination in Thailand. Subramanian and Deaton (1991) test the gender gap in the intrahousehold consumption patterns in Maharashtra, India using the outlay equivalent/adult good approach. The study finds in urban areas a pro-male preference for educational and medical expenditures while expenditures on basic foodstuffs are either gender-neutral or pro-female. In rural households, discrimination against girls has been found among young age groups. However, there is no evidence of gender disparity in the household allocation of resources. Haddad and Reardon (1993) find no significant gap in the intrahousehold allocations towards male and female children in Burkina Faso Burkina between agro-economical zones (rural versus urban) and income strata.

Applying the outlay equivalent technique for adult goods and educational and medical expenditures for rural areas of five Indian states, Subramanian (1995) fails to find evidence of gender discrimination in the northern states, although Andhra

Pradesh and Maharashtra show some evidence of gender discrimination in the 5–9 age group. The study finds some evidence of gender bias in educational expenditure in Andhra Pradesh and Rajasthan, and gender discrimination in medical expenditure in Rajasthan and Punjab.

Kingdon (2005) questions the household level consumption-based Engel curve approach to detect gender bias in household resource allocation, and argues that the extent of gender bias can only be captured using individual-level educational expenditure data. Using the 1994 NCAER household survey data, the study finds that the individual level estimates detect about one-third of gender bias in education expenditure than the household level estimates in terms of non-enrolment of girls and expenditure allocation on girl children in India.

Lancaster, Maitia and Ray (2008) analyse the budget share of education expenditure as well as the effect of male bargaining power on budget share in Indian states using the Standard Living Survey and the 1993–94 50th round of NSSO data. The study finds that household size has a statistically significant negative effect on education expenditure patterns and a significant gender bias in favour of boys in the household educational expenditure. The male bargaining power and household income have a statistically significant positive impact on the household budget share of education.

Husain (2011) studies the gender gap in enrolment, educational attainment and educational expenditure in India using the 2009 64th round of NSSO data, district-level data from the 2001 census and the 2005–06 district information on education data. The OLS, probit and double hurdle model estimates show that households spend more on boys and the coefficient on male dummy is significantly positive.

Data and Methodology

To analyse gender bias in India in educational expenditure and the effect of bargaining power on the budget share of education, this paper uses the 68th round of NSSO data (2011–12), consisting of 59,695 rural and 41,967 urban households, applying three stage least square method for both rural and urban areas of Kerala and Bihar. Kerala and Bihar are the two contrasting states in India in terms of literacy rate — Kerala has the highest literacy rate and Bihar is one with the lowest literacy rate in India. The NSSO data allows the answer to the questions: whether gender bias and rural-urban disparities are a general prevalence in India or specific to certain regions alone?

As per the NSSO 68th round data, the average MPCE in 2011–12 was ₹1430 for rural and ₹2630 for urban India, and the household expenditure of the bottom 5 per cent of the population in rural India is just ₹7.54 per month, compared to ₹908.12 of the top 5 per cent of the

population. In Kerala, the average MPCE is ₹ 2669 in rural and ₹ 3408 in urban areas. The MPCE is ₹ 1127 in rural Bihar and ₹1507 in urban Bihar. In Kerala, the rural-urban gap in MPCE was 28 per cent and 34 per cent in Bihar. In 2011–12, the educational expenditure was ₹ 50 per person per month in rural and ₹ 181.50 in urban India, constituting about 3.5 per cent and 7 per cent of MPCE of households. While rural households spend 15.3 per cent, urban households spend 18.4 per cent of household expenses on higher education in India (Chandrasekhar et al., 2019).

Theoretical Model

Theoretically, this paper follows the collective household model of Bourguignon and Chiappori (1992), Bourguignon, Browning, Chiappori and Lechene (1993) and Browning and Chiappori (1998). The household objective function is a weighted sum of utilities of household members, male (m) and female (f), which depends upon the consumption of commodities (x) and leisure (l) of each member separately:

$$Max[\theta u_m(x_m,x_f,l_m,l_f)+(1-\theta)\, u_f(x_m,x_f,l_m,l_f)] \quad (1)$$

The household income constraint is:

$$\sum_{i=m,f} px_i \leq \sum_{i=m,f}[w_i\,(T_i-l_i)]+I \quad (2)$$

Where, u represents the utility of member i, T_i the time endowment, w wage rate, I the total household unearned income, p a vector of prices of goods, and θ () the welfare weight of member i that depends on the bargaining power within the household.

The household members solve the following separate utility maximisation problems:

$$Max\ u_m(x_m) \text{ subject to } px_m=\theta S \quad (3)$$

$$Max\ u_f(x_f) \text{ subject to } px_f=(1-\theta)S \quad (4)$$

Where, S denotes total (full) household income $[w_i(T_i-l_i)+I]$. Solving the equations yields the individual demand equations for good x, say educational expenditure, in budget share form, i.e., as the share of each household member's allotted expenditure:

$$b_m^x = \alpha_m^x + \beta_m^x[\theta S] + \varepsilon_m^x \quad (5)$$

$$b_f^x = \alpha_f^x + \beta_f^x[(1-\theta)S)] + \varepsilon_f^x \quad (6)$$

Where, ε_m^x and ε_f^x are stochastic error terms. However, the demands for individual goods b_m^x and b_f^x are not typically observable as surveys do not collect data on gender specific expenditure on specific commodities. Hence, studies assume that the household level budget share of good is the θ weighted average of the budget share of that good of the spouses (m, f):

$$b^x = [\theta b_m^x + (1-\theta) b_f^x] \quad (7)$$

On substitution, the estimating equation, including household size and composition variables, can be specified as:

$$b^x = a_0^x + a_1^x\theta + \beta_f^x\theta^2 S + \beta_1^x(1-\theta)^2 S + \lambda^x In(n) + \sum_i = mf \sum_{k=1}^{k} \phi_{ik}^x \left(\frac{nik}{n}\right) + \varepsilon^x \quad (8)$$

(8)

Where, $x=1,\ldots,X$ denotes the goods, n the size of household and n_{ik} number of individuals in the household in the gender i and age category k.

As the household composition matters, a test of the statistical significance of the estimated difference in the effect of changing household composition on budget shares $\left(\phi_{mk}^{x}-\phi_{fk}^{x}\right)$ constitutes a test of gender bias in the age group k in the expenditure allocation of good x. Then, the expenditure on a particular commodity depends on the gender composition of children also.

As the male welfare weight θ, which is a determinant of budget shares is jointly determined with household expenditure and budget shares, θ is potentially endogenous in the budget share equation. The years of schooling of the household head is commonly used as a proxy for the welfare weight as it directly affects the earnings or income. To consider the potential endogeneity, the male bargaining power, monthly per capita household expenditure and educational budget share are jointly estimated as a set of simultaneous equations using the 3SLS model. The three estimating equations are specified as:

$$\theta=g(z_1)+v_1 \quad (9)$$

$$HExp=h(z_2)+v_2 \quad (10)$$

$$b^x=\psi(\theta,HExp,z_3)+v_3 \quad (11)$$

Where, HEXP is per capita household expenditure, z_1, z_2 and z_3 are the vectors of exogenous determinants.

The budget share of education is calculated as a ratio of household education expenditure to total household expenditure. The bargaining power of the household head is measured by the ratio $[Edu_m/(Edu_m+Edu_f)]$ where, Edu_m is the years of education of the most educated male member of the household and Edu_f is the years of education of the most educated female member of the household.

Three Stage Least Squares Estimation Method (3SLS)

The 3SLS estimation method considers the general linear model containing G jointly endogenous variables and k predetermined variables. There are i equations that can be written as—

$$y_i=\beta_i x_i+\gamma_i z_i+u_i \quad (12)$$

Where, y_i is an $nx1$ vector of the dependent variable in the i^{th} equation, x is an nxg_i matrix of other endogenous variables in the equation, z is an nxk matrix of the predetermined variable in the equation. The β and γ are the vectors of structural parameters and u is a vector of disturbance terms. Rewriting equation (12) as—

$$y_i=\omega_i \psi_i+u_i \quad (13)$$

Where, $\boldsymbol{\psi}_i=[x_i,z_i]$ and $\omega_i=\frac{\beta}{\gamma}$, the 3SLS model specification is:

$$\begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_G \end{bmatrix}=\begin{bmatrix} \dot{E}_1 & 0 & \ldots & 0 \\ 0 & \dot{E}_2 & \ldots & 0 \\ \vdots & \vdots & \vdots & \vdots \\ 0 & 0 & \ldots & \dot{E}_G \end{bmatrix}\begin{bmatrix} \omega_1 \\ \omega_1 \\ \vdots \\ \omega_G \end{bmatrix}+\begin{bmatrix} u_1 \\ u_2 \\ \vdots \\ u_G \end{bmatrix} \quad (14)$$

Where, u has a zero mean and variance-covariance matrix $\Sigma^{\otimes}\boldsymbol{I}$ are

possible correlations between the disturbances. Applying GLS on the whole system yields:

$$\hat{\omega}_{GLS}=[\psi^T (I\otimes x)\ \Sigma^{-1}\otimes(x'\ x^{-1})]\ [(I\otimes x')\psi]^{-1}\ [\psi^T (I\otimes x)\ \Sigma^{-1}\otimes(x'\ x^{-1})][(I\otimes x^T)y] \quad (15)$$

Simplifying,

$$\omega_{GLS}=[\psi^T (\Sigma^{-1}\otimes I)\psi]^{-1}\ [\psi^T (\Sigma^{-1}\otimes I)y] \quad (16)$$

However, an estimate of Σ for i^{th} equation is needed. Estimating by 2SLS, the residuals are obtained so that $u_i = y_i - w_i \psi_i$ and the estimate of Σ is given by $\Sigma = \left|\hat{\sigma}_{ij}\right|$ where:

$$\sigma ij = \frac{\left(y_i - \hat{\delta}_j \psi_i\right)\left(y_i - \hat{\delta}_j \psi_i\right)}{\sqrt{T - g_i \quad k_i}\sqrt{T - g_j \quad k_j}} \quad (17)$$

Hence, the 3SLS estimator is given by:

$$\omega_{3SLS}= \left[\psi\left(\hat{\Sigma^{-1}}\otimes I\right)\hat{\psi}\right]^{-1} \hat{\psi}(\Sigma^{-1}\otimes I)y \quad (18)$$

The estimating 3SLS equations are specified as:

$$b^x = \delta_0 + \beta_1\theta + \beta_2(EXP) + \beta_2(HHsize) + \beta_k \sum_{k=1}^{k} \phi_{ik}^x \left(\frac{n_{ik}}{n}\right) + \xi_1 \quad (19)$$

$$\theta = \delta_1 + \beta_4(Maleedu) + \beta_5(Maleedu)^2 + \beta_6(HHSize) + \beta_7(Socia\lg roup) + \beta_8(\mathrm{Re}ligion) + \xi_2 \quad (20)$$

$$Exp= \delta 2+\beta_9(HHage)+\beta_{10}(\text{HHmaritalstatus})+\beta_{11}(HType)+\beta_{12}(HHedulevel)+\beta_{12}(\text{HLandholding}) +\xi_3 \quad (21)$$

Empirical Results

Table 1 presents the descriptive statistics of the variables used in the analysis of the determinants of the budget share of education expenditure in total household expenditure. The MPCE is higher in urban areas than in rural areas of Bihar and Kerala. In rural Bihar, the average year of the most educated male in the household is twice greater than the year of schooling of most female educated, in both rural and urban Kerala the years of schooling of most educated male and female in the household are approximately the same. Households in urban areas allocate more resources to education in the total budget of the household.

Table 1
Description and Measurement of Variables

Variable	Urban Bihar	Rural Bihar	Urban Kerala	Rural Kerala	Urban India	Rural India
Per capita monthly expenditure (proxy for total household income) (₹)	1600.79 (1314.68)	698.16 (434.57)	2846.46 (2822.96)	3381.28 (1449.69)	2612.47 (4388.63)	1656.05 (4026.19)

Education of most educated male in the household (yrs)	8.54 (5.98)	6.11 (5.52)	7.57 (5.64)	6.10 (5.10)	8.76 (5.88)	5.75 (5.44)
Education of most educated female in the household (yrs)	3.49 (4.92)	2.04 (3.80)	5.23 (4.94)	4.90 (4.76)	5.23 (5.75)	2.71 (4.33)
Household size	5.05 (2.65)	5.31 (2.35)	4.49 (2.42)	4.36 (2.02)	4.17 (2.20)	4.78 (2.25)
Budget share of education expenditure	0.075 (0.089)	0.037 (0.049)	0.092 (0.224)	0.061 (0.102)	0.086 (0.137)	0.266 (0.254)
Sample	1720	3312	3382	5318	41967	59695

Notes: Standard deviations in parentheses

Tables 2 presents the 3SLS estimates of the budget share of education expenditure in household expenditure for rural and urban Bihar and rural and urban Kerala. In rural Bihar, an increase in the proportion of boys in the age group 11–16 significantly increases the budget share of education by 2.17 per cent while an increase in the number of girls aged 11–16 increases the budget share of education by 0.7 per cent only. In urban Bihar, an increase in the proportion of boys in the age group 11–16 increases the household budget share of education by 1.4 per cent while an increase in the number of girls aged 11–16 increases the budget share of education by 1 per cent. Thus, the results show a significant gender bias in household educational expenditure, and in both 6–10 and 11–16 age groups, the bias runs in favour of boys, though statistically significant only for the age category 11–16. The male household bargaining power has a statistically significant positive effect on the budget share of education in urban Bihar, but statistically insignificant in rural Bihar. In urban Bihar, a unit increase in household head male bargaining power increases the budget share of education increase by a sizable 16.8 per cent.

Table 2
3SLS Estimates of Budget Share of Education Expenditure in Household Expenditure in Rural and Urban Bihar and Kerala

Dependent variable	Independent variable	Bihar		Kerala	
		Rural	***Urban***	***Rural***	***Urban***
Household budget share of education expenditure	Male bargaining power	0.003 (0.006) [0.56]	0.168* (0.020) [8.27]	-0.011 (0.017) [0.63]	0.054** (0.021) [2.55]
	Per capita monthly household expenditure	0.00003* (0.00001) (5.90]	-0.00007* (0.00001) [5.85]	7.83* (1.95) [4.03]	1.09 (6.80) [0.02]
	Household size	-0.011 (0.0037) [0.27]	-0.733* (0.012) [6.12]	0.0163*** (0.009) [1.74]	0.014 (0.01`) [1.08]
	Male child-0–5 years	0.0002 (0.0014) [0.16]	-0.0002 (0.005) [0.04]	-0.006 (0.005) [1.16]	0.003 (0.007) [0.49]
	Male child 11–16 years	0.0217* (0.0013) [4.74]	0.0139* (0.004) [3.37]	0.009** (0.004) [2.19]	0.012** (0.006) [1.99]
	Female child-0–5 years	-0.0003 (0.002) [0.18]	0.001 (0.005) [0.21]	-0.007 (0.005) 1.42]	00.013*** (0.0071) [1.81]
	Female child 11–16 years	0.007* (0.002) [4.25]	0.011** (0.005) [2.34]	0.007 (0.005) [0.02]	0.011*** (0.006) [1.75]
	R-square	0.15	0.22	0.14	0.28
	Chi-square	14.35	94.75	36.08	27.33

Male bargaining power	Male education share	1.843* (0.098) [18.68]	2.696* (0.250) [10.75]	1.57* (0.119) [13.16]	2.240* (0.218) [10.23]
	Male education share square	-1.497* (0.075) [19.76]	-2.183* (0.181) [12.03]	-1.269* (0.100) [12.68]	--1.773* (0.174) [10.16]
	SC/ST household	-0.086* (0.016) [5.45]	-0.067* (0.081) [2.89]	-0.130* (0.015) [8.68]	-0.114* (0.026) [4.50]
	Hindu household	0.067* (0.0173) [3.91]	0.120* (0.0287) [4.21]	0.048* (0.011) [4.30]	0.020 (0.18) [0.25]
	Household size	-0.186* (0.015) [11.72]	-0.224* (0.020) [11.18]	-0.002* (0.011) [13.23]	-0.241* (0.02) [11.80]
	R-square	0.18	0.22	0.12	0.13
	Chi-square	5.54	13.41	3.29	3.84
Per capita household expenditure	Age of household head	5.91* (1.093) [5.24]	2.56 (3.55) [0.72]	-0.743 (0.012) [0.46]	9.66 (6.32) [1.06]
	Married household head	-7.601* (1.554) [4.94]	-4.184** (1.824) [2.29]	-7.441 (11.50) [0.28]	-2.520* (0.578) [4.17]
	Nuclear household	11.827* (3.144) [3.43]	9.423 (8.239) [1.17]	15.943** (6.123) [2.29]	2.632 (1.985) [1.29]
	Head secondary school educated	8.683* (2.172) [3.75]	6.849* (1.206) [5.62]	19.211* (9.201) [1.28]	10.194* (2.781) [3.04]
	Head graduate and above	7.557* (2.88) [4.14]	11.936* (1.459) [8.20]	5.104* (2.012) [2.76]	21.717* (3.291) [7.38]
	Land owned	0.055* (0.008) [6.55]	-0.008 (0.061) [0.14]	0.350** (0.156) [2.01]	0.161** (0.083) [1.91]
	R-square	0.16	0.14	0.20	0.23
	Chi-square	4.35	25.73	5.41	21.47

Notes: Standard errors in parentheses z-values in brackets
** significant at 1% level*
*** significant at 5% level*
**** significant at 10% level*

The statistically significant positive sign of the coefficient of education share of the most educated male in the household, and the negative sign of its square term show that the male bargaining power increases with education in Bihar, which could make males allocate more budget to educating children, but the male bargaining power declines beyond a certain level of education. Education increases male bargaining power by 18 per cent in rural Bihar and 27 per cent in urban Bihar. Males belonging to Hindu households in Bihar have higher bargaining power compared to other religious households. In the SC/ST households, male bargaining power declines by 8.6 per cent in rural Bihar and 6.7 per cent in urban Bihar compared to other social groups. An increase in household size decreases male bargaining power in both rural and urban Bihar by about 2 per cent.

In the per capita household expenditure estimation of Bihar, the dummy variables of education of the household head are positive and statistically significant. Similarly, the higher age of the household head increases per capita household expenditure. While land ownership increases per capita household expenditure in rural Bihar, marriage reduces household expenditure in both rural and urban Bihar.

In Kerala, the household monthly household expenditure, household size and presence of the male child in the age group 11–16 have a statistically significant positive effect on the budget share of education expenditure, while the male bargaining power has a significant negative effect. The presence of school going female children influences the budget share of education, and the male bargaining power turns out to be significantly positive in urban Kerala. In rural Kerala, a unit increase in the proportion of boys in the age group 11–16 increases the budget share of education by 0.94 per cent while a unit increase in the number of girls aged 11–16 increases the budget share of education by 0.072 per cent. In urban Kerala, a unit increase in the proportion of boys in the age group 11–16 increases the budget share of education by 1.22 per cent while a unit increase in the number of girls aged 11–16 increases the budget share of education by 1.07 per cent. In urban Kerala, with a unit increase in household head male bargaining power the budget share of education increases by 5.37 per cent. Thus, there also exists significant gender bias in favour of boys in the household educational expenditure in Kerala.

In the estimates of male bargaining power in Kerala, the coefficients of the education share of the most educated male in the household and its square are respectively positive and negative, and both are statistically significant. The bargaining power in the household increases with male education possibly giving rise to more resource allocation to education. However, as the square term shows the male bargaining power declines

beyond a certain level of education. Males in Hindu households have more bargaining power and the males in SC/ST households have less bargaining power by 4.8 per cent in rural and 2 per cent in urban Kerala compared to other social groups. In the per capita household expenditure estimates, the coefficients of nuclear household, education, and land possessed are positive and statistically significant in both rural and urban Kerala. In urban Kerala, the marital status of the household head has a significant negative effect on household income.

Conclusion

There exists significant gender bias in India. Generally, males are favoured over girls in the household allocation of resources, especially education and health. The scenario is the same either in advanced and literate states like Kerala, and in the most backward and illiterate states like Bihar. The gender gap in intrahousehold resource allocation refuses to die even in the face of globalisation, women education, women property and legal rights, and labour force participation. A partial explanation is in the patriarchal system of Indian society, wherein, male heads generally control income sources and allocation of resources within the household. This basic structure of the household coupled with higher male education attainment and labour force attachment increases the male bargaining power in the differential allocation of resources towards educational expenditure on boys and girls within the household.

The main objectives of this paper are the two vexed questions central to the household resource allocations pattern: does the allocation of household educational resources favour boys over girls, and does the relative bargaining power of the decision-maker within the household influence the budget share of household education expenditure. To examine the issue of gender bias in education expenditure in a diverse country like India, this paper considers two contrasting scenarios, rural and urban differentials in the developed state of Kerala and the backward state of Bihar. The data used is derived from the 68th round (2011–2012) NSSO data on Bihar and Kerala. This paper follows the theoretical approach of the collective household model and applies the three stage least square (3SLS) estimation method on the share of education expenditure in the household budget associated with an addition of a boy and a girl child in the household.

The 3SLS estimates of this paper show a significant gender gap in the budget share of education expenditure of households in rural and urban Bihar and Kerala. Even with noticeable differences, there is not much difference in the gender allocation results in households in Kerala and Bihar. Urban households in both states allocate more resources to education compared to rural households. The gender disparity is more strongly prevalent

in urban Bihar and Kerala, whereas in rural areas it is not so strong. An increase in the proportion of boys in the household increases the budget share of education expenditure in the household relative to an increase in the proportion of girls in the household. The male bargaining power has some effect on the budget share of household education expenditure in urban households but does not affect resource allocation to education in rural households of Bihar and Kerala.

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Unemployment and Women Education

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Abstract

Education is a very important tool for human resource development particularly women education. The significance of the study is to highlight the unemployment rate among women, there causes and effect in the day-to-day life of the people of Ragailong. In the present study an attempt is made to explain the literacy and unemployment rate of the women of Ragailong. It also highlighted that most of the married women though educated and qualified are deprived from working and finding a job because of their responsibility to the family. From the study, it was found that educationally and socially, the present condition and status of the people of Ragailong village has improved and developed a lot in comparison to the past, as the literacy and employment rates are found to be high in the village but it is definitely high time for all the people to give self-employment a prominent place in the society rather than waiting for the government job offers. Also, both women and men should be given equal rights and freedom to freely choose the job they wish to pursue to aid in women development and empowerment.

INTRODUCTION

Unemployment is defined as a situation when a person who is actively searching for employment and is unable to find work. Unemployment is a key social and economic indicator because it signals the ability of workers to readily obtain gainful work to contribute to the productive output of the economy and the dignity of labour force. Number of more unemployed workers means less total economic production will take place than might have otherwise. This means that the economy with high unemployment has lower output without a proportional decline in the need for basic consumption. The

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unemployment rate is one of the most widely quoted issues nowadays, and is an important market indicator providing information and status of voluntary labour. Unemployment is categorised as voluntary and involuntary unemployment. Voluntary unemployment occurs when a person, who is fit to work in a specific job role quits his job willingly, either in the search for better work opportunities or any other reasons even when a suitable job option is still available to him in the market. On the contrary, involuntary unemployment occurs when a person do not get work even though he is a fit for the specific job or position and also has the will to work. (Liat, 2000). In Manipur, the number of unemployed persons in the state is nearing the 7 akhs mark as the current number stands at 6,86,568 lakhs according to the data provided by the Employment Exchange, Manipur. Of the total number, male job seekers are 4,96,743 lakhs while 1,89,8251 akhs are female (Shushil, 2016).

According to the district ratio in district level, a total of 2, 22,007 lakhs are there in Imphal West district, of which 1,54,146 lakhs are male and 67,861 thousand are female. In Imphal East district a total number of 1,01,771 are job seekers, of which 72, 837 are male and 28,938 are female. In Thoubal district, the total number is 1,04,937 lakhs, of which 82,970 are male and 21,967 are female. In Bishnupur district the total number is 63,279 of which 47,141 are male and 16,138 are female. In the hill districts there are a total of 61,919 thousand job seekers of which 46,108 are male and 15,811 thouands female in Churachandpur district. In Ukhrul districts there are 19,044 male job seekers and 8,274 female job seekers with a total of 27,318. In Senapati district, the total number is 50,929 thousand, of which 36,884 are male and 14,078 are female. In Tamenglong district, there are 20,932, of which 15,929 are male and 5,003 are female. In Chandel district there are 17,314 male and 4,002 female with a total of 25,316 job seekers. For the remaining new districts datas are found to be are inadequate. In the physically challenged category, out of the total 2,379 1614 are male and 766 female, and in University Employment Information and Guidance Bureau UEIGB, there are total of 5,744 thousand of which 17,56 are male and 1,988 female (Kangla, 2011).

The study is confined to Ragailong Village which is situated in Imphal East district of Manipur under Porompat Sub-Division, Irilbung Block and under the jurisdiction of Imphal East Police Station and Imphal East Post Office. The village is surrounded by Khuman Lampak sports complex in the East, Naga River and 2nd Battalion Manipur Rifles in the West, Namdulong in the South and Assam Rifle Transit Camp and Commando Complex in the North.

Before 1891, there were clusters of Rongmei families scattered over the present-day Johnston Hr. Sec

School, GM Hall and the Old Manipur Legislative Assembly complex, called Bajanam (Royal Band Party Colony), Singsaloi (Firewood supplier colony) and Phousukhun (colony of rice pounding or milling), in service to the King of Manipur. After the defeat of Anglo Manipur War of 1891, Manipur came under the British colonial paramountcy. And the erstwhile Rongmei families were ordered to evacuate the vicinity of the British political agency residence. Thus, seven families who were earlier living at Bajanam (Band party colony) founded the Ragailong illage at Khuman pat (now Khuman Lampak or Khuman Lampak sports complex) in 1891. The great Imphal flood of 1928, in which Ragailong suffered untold misery due to the breaking of embankment (near the present-day suspension bridge between Khuman Lampak and Khurai/Telipati) and deluge of the entire village, the villagers decided to move to a more elevated ground and a safer place. Thus, they shifted to the present-day location (Karangchonglu Kamei, 2018)

The inhabitants of Ragailong village were the Rongmei tribe speaking Rongmei language. The village has a system of chieftainship. There is a primary school called Minuthong Kabui Upper Primary School, and a high school known as Brighter English School. There is a Community Hall, Ragailong Museum Ground, Women Society Building and a Youth Club Building. There is also a pond known as Mijum Pukhri by the villagers. Ragailong village comprises of 223 households, having a population of 1004 with 444 males and 560 females according to the survey report.

Need and Significance of the Study

Unemployment leads to wastage of manpower resources. People who are assets for the economy get termed into liability due to increased unemployment rate. There is a feeling of hopelessness and despair among the people. Unemployment tends to increase economic overload. The dependence of the unemployed on the working population increased. The quality of life of an individual as well as the society is adversely affected. The significance of the study is that it can highlight the unemployment rate among women, there causes and effect in the day-to-day life of the people of Ragailong. Understanding more about unemployment would lead to a better knowledge about making oneself self-employed. In order to know the social and economic status, and also to find out the literacy and unemployment rate of Ragailong village the study is quite necessary.

Objective of the Study

The objectives of the Study are:

(i) To find out literacy rate and unemployment rate.

(ii) To study the causes and effect of unemployment among women.

Hypothesis of the Study

The following are the hypothesis of the study:

H1: The overall literacy rate of the women is satisfactory.

H2: The number of unemployed women is low.

H3: The number of married unemployed is higher than the unmarried unemployed.

Delimitation of the Study

The present study is limited only for women among the age group 25–35 years in Ragailong village, Imphal East district of Manipur.

Methodology

The method adopted in the present study is a survey method, and the investigator has taken 1004 population of Ragailong village, Imphal East. Out of this, 560 are female of whom 163 are of the age group between 25–35 years.50 women were selected as samples of the study. For the purpose of the present study, interview schedule had been used to collect the required data from the women among the age group of 25–35 years as it was thought to be a more flexible tools for collecting both quantitative and qualitative data. In order to analyse and interpret the data, the investigator had adopted the percentage statistical technique.

Analysis

The investigator made an attempt to analyse and interpret the data selected for the present unemployed rate of women among the age group of 25–35 years in Ragailong village, Imphal East, Manipur. According to the scope of the study, 50 women were interviewed. Responses of the women were collected regarding the literacy, unemployment and the cause and effect faced by the unemployed women. The total population of male and female in the age group 25–35 years in Ragailong village is 309, where 146 are males and 163 are females. It shows that the number of females are higher than that of males in the village, and maximum numbers of women are literate.

Table 1
Number and percentages of the educational attainment levels of women in Ragailong between the age group 25–35 years

S.No.	Levels of Education	No. of Women	Percentage
1.	Illiterate	3	6%
2.	Simply literate	4	8%
3.	Matriculate	11	22%
4.	Hr. Secondary	6	12%
5.	Graduate	20	40%
6.	Post Graduate	6	12%
Total		50	100%

Table 1 shows the educational attainment levels and the percentages. At the graduate level there are 20 women, and 11 women at the matriculation level, while at the post graduate and higher secondary level there are 6 women each respectively, and 4 women are simply literate and 3 illiterate women in the village.

From the above analysis, it is found that maximum number of women are literate. Therefore, the overall literacy rate of the women is satisfactory and accepted.

From the above table, it is found that the number of unemployed women is lower than that of employed women, and number of married unemployed women is higher than the unmarried unemployed women.

Table 3 shows the different opinion of women and their views about the causes of unemployment. The data indicated that according to 6 per cent of the women unemployment is because of economic recession, 22 per cent due to increased birth rate,

Table 2
Total number and percentage of employed and Unemployed Women along with their Marital Status

S.No.	Current Status	No. of Women	Percentage	Marital Status		Total
				Married	Unmarried	
1.	Employed	31	62%	8	23	31
2.	Unemployed	19	38%	12	7	19
TOTAL		50	100%	20	30	50

Table 2 shows the current status and percentage of employed and unemployed women in the village. And it also shows their marital status. There are 31 employed women and 19 unemployed women. The table also shows that there are 8 married employed women and 23 unmarried employed women. There are 12 married unemployed women and 7 unmarried women.

10 per cent because of increasing technology, 48 per cent due to illiteracy and 14 per cent due to other reasons.

Thus, the above analysis shows that the main cause of unemployment is illiteracy, i.e., 48 per cent of the women under study affirmed the highest percentage to illiteracy as compare to other causes of unemployment.

Table 3
Cause of Unemployed

S.No.	Causes	No. of Women	Percentage
1.	Economic recession	3	6%
2.	Increase birth rate	11	22%

3.	Increasing technology	5	10%
4.	Illiteracy	24	48%
5.	Others	7	14%
TOTAL		50	100%

Main Findings

In the light of the objectives, hypothesis, data analysis and interpretations of the study, the investigator has summed up the main findings of the study in the following manner.

- From the selected sample, the literacy rate of the women was high.
- Women have mostly attained the post graduate level of educational qualification.
- The employment rate was high among the women between the age group of 25–35 years in Ragailong Village.
- The rate of unemployment among the married women was higher than the unmarried women.
- The number of employed women was higher among the unmarried women than the married women.
- Illiteracy was the main cause of unemployment.
- Financial problem and social inferiority among their social group was the main effect of unemployment.
- The women of Ragailong village are ambitious and industrious people.

Conclusion

In the broadest sense, employment of women is a must for the empowerment of the women in particular. Most of the married women of Ragailong though educated and qualified are deprived from working and finding a job because of their responsibility towards their family. From the study it was found that educationally and socially, the present condition and status of the people of Ragailong village has improved and developed a lot as compared to the past, as the literacy and employment rates are found to be high in the village. And it may also be noted that increased in the literacy rate and competition among job seekers are the main reasons behind unemployment. To cope with the present situation of unemployment in the village, the government and other agencies needs to come up with new schemes providing job opportunities equally to both male and female. It is quite important that an effort should be made to change the negative attitudes of the society toward working women. It is high time for all the people to give self-employment a prominent place in the society rather than waiting for the government jobs. Lastly, both women and men should be given equal rights and freedom to freely choose the job and work that they want to get themselves employed with.

Suggestions

On the basis of the above findings, the following suggestions have been put forward for consideration—

- Women literacy should be necessary to encourage in attaining full literacy among the women.
- Employment among women particularly married women should be encouraged for better confidence and financial stability.
- Women should be made self-employed through functional literacy.
- Proper awareness should be given about the importance of employment among the people.
- There is quite a need for rapid expansion of public and private sector jobs.
- Various job facilities should be made available, and educated youths should also be encouraged to seek jobs outside of the district as well as outside of the state.
- Self-service group and self-employment service should be strengthened by ensuring more participation of the people in different workforce.
- Different kind of study can be done more elaborately for further improvement.

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A Study of Leadership Behaviour of Secondary School Principals of Bareilly

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Abstract

Human capital management is a challenging task. It requires strategic planning and purposeful practices to secure outstanding talent, and apply it as per the goals in the organisational settings (Burn, 1978; Kumar, 2018). The role of school principal is changing from superheroes towards an orchestra conductor who shares his leadership skills and uses it for school management. Through leadership behaviour, school principals give direction to management system for policy implementation, resource allocation and relationship building. The present study is concerned with leadership behaviour of secondary school principals (N=100) of Bareilly district of Uttar Pradesh, which reveals significant differences in leadership behaviour of school principals with reference to the type of institution, gender and locality. Private school principals revealed higher level of leadership behaviour in comparison to government college principals while with reference to gender, female principals showed higher level of leadership behaviour in comparison to male counterparts. On the other hand, in aspects of locality, very few significant differences were found between urban and rural school principals.

Introduction

Leadership is a way of management which a person uses to lead other people working in his team. Employees of any organisation play an important role in providing qualitative output for the organisation. It enables them to have clarity in concepts related to their expectations, requirements and performance. Davis (1975) defined, "Leadership is the ability to persuade others to seek defined objectives

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enthusiastically. It is the human nature which binds any group of people to work together and motivates each other to reach predefined goals." Robbins (1979) defined Leadership as "the ability to influence a group towards the achievement of goals." In any other field, Leadership is a driving force behind organisational success but compared to the education field, other industries go to great lengths in prioritising finding, developing, supporting, and retaining their leaders. In the Indian context, it is the principal who occupies the central role in the school leadership and management. A typical day of a school principal involves enlisting and guiding the talents and energies of teachers, students, and parents toward achieving common educational aims.

With reference to organisational management policies, National Policy on Education (NPE, 1986) also suggested to draw long term planning and management by policymakers and school administrators especially in India because it will fulfill manpower needs and contribute in the national development. The policy document also recommended for decentralised and autonomous system of educational organisations for better growth and development. Similar suggestions related to development of autonomous system of curriculum and administrative structure, and more power to school leaders have also supported in the reports of Acharya Ramamurti and Yashpal Committee (Govinda and Bandopadhyay, 2006).

Leadership behaviour of school Principals give direction to school management system through interpretation of policy, allocation of resources and relationships with community. School principals have to manage various routine activities in the school premises to provide qualitative education to students. Leadership skills of school principals are often the key factor of difference between effective and ineffective schools (Blackburn, 2009; Kearney, 2010; Zhang, 1994). The School Leadership Development Programme (SLDP), initiated by the National Institute of Education Planning and Administration (NIEPA), lists out five key areas where head-teachers could play an important role which are-leading partnerships, developing self, transforming the teaching-learning process, building and leading teams, and leading innovations (SLDP, 2014). Researches reveal that school principals with good leadership skill encourage positive school climates, including high-quality of school culture, teaching, learning, assessment, academic and non-academic performance, communication, accountability and relationship among school, families and community (Chernow, 1985; Hallinger, 2004; Kearney, 2010). Five domains of leadership skill that have been associated with effective school principals are instructional leadership, cultural leadership, strategic

leadership, educational management leadership and organisational management leadership (Allen, 2003; Umme, 1999; Fink and Resnik, 2001). Researchers also revealed that connection between school leadership with various other school factors with reference to environment of school, teaching-learning setups, culture, motivations and behavioural approach of teachers and academic performance of students, including students' performance and achievement.

In contrast to the western experience, school leadership and management have remained an understudied area (Leithwood, 2005). Drucker (1989) mentioned that leadership is not created, taught and learned. Thus, a great amount of attention was dedicated to understand the number of characteristics that are found in leaders. Drive, self-confidence, cognitive ability, honesty, knowledge of context, desire to lead and integrity are considered to be the most commonly observed traits of successful leaders. The tasks performed by school principals are more diverse and demanding than ever before. Analysing daily logs of principals' activities, researchers found that the allocation of principals' attention varies from school to school, even within a single district. Principals in more advantaged schools spend their time in a greater spread of different types of activities than principals in less advantaged school facing more challenging situations (Fink and Resnick, 2001; Lambert et al., 2002).

Review of Related Studies and Literature

A specific policy framework is also developed and implemented in United States about the role of school principals in performance management. Similar steps has also been followed by Hong Kong and Singapore to introduce new assessment framework. The head teachers in New Zealand coordinated with the teachers to undermine the standardised curriculum, which had sought to take away the school autonomy on the matters of curricular activities. Similarly, in other countries also, government introduced a new legal framework to regulate and monitor schools, school principals, teachers, and the local communities. In another example from Spain, principals sought to circumvent the compulsory structures or procedures the state had put up for school governance (Òscar Prieto-Flores et al., 2018). In all these case studies, the role of school principals found important and more expectations drawn to face challenging situations.

Principals, with active participation from the local communities, not only resisted the centralisation attempt from educational bureaucracies but also expanded their roles significantly by involving communities. Community related hurdles and boundations also put impact of growth and development of schools. Similarly, the educational decentralisation in India produced different logics, depending

upon the contexts and the limitations set by the system (Chand and Kuril, 2018). Harding (1949) explained types of educational leaders as autocrat, co-operator, elder statesman, muddled, loyal staff man, scientist, open-minded, philosopher, business expert, benevolent, child protector, community-minded, optimist and democratic. Researchers (Blackburn, 2009; Alvy and Robbins, 2005; Portin, 2004; Berlin et al., 1988; Lam, 2003; Chernow, 1985; Clifford et al., 2012) explored about the significant roles of school principals as instructional leader (Blackburn, 2009; Alvy and Robbins, 2005; Portin, 2004; Berlin et. al., 1988), and some of them emphasised the importance of cultural leadership for school effectiveness and student achievement (Blackburn, 2009; Lam, 2003) while others focused on the significance of strategic leadership (Chernow, 1985).

Chopra (1982) studied the impact of principals' approach on primary teachers with references to organisational climate and found that the behaviour of the leader or the principal put positive impact on the organisational environment, and it also helps teachers and staff in boosting their communication skills and strengthen interaction process among teachers on gender basis. Shashkin (1988) studied the leadership styles of principals and reported significant differences among male and female, rural and urban and government and private sector principals on different dimensions. An effective principal with such approach not only sets high expectations and articulates a strong vision but also presents models of good instruction, observes all stakeholders, coaches teachers and provides them with opportunities to reflect on and improve their practices. Such change in principals' roles and approach is reflected in recent standards and performance-based principal evaluation processes that emphasise instructional and collaborative leadership practices. School conditions also include the working conditions of teachers, such as the strength of professional communities, availability of adequate instructional time, and other professional supports.

Dembowski (2008) studied about relationship between working abilities and leadership behaviour among school principals of rural and urban area, and reported that principals with more positive leadership and decision-making skills have higher level of leadership. Urban area counterparts found highly active than their rural counterparts. Roghaiyeh and Pravenna (2013) conducted a study on businesswomen and their leadership skills and reported that female leaders' emphasised on democratic work environment, interactive approach and effective communication system for the betterment and growth of any institution. The more attention on morality and interrelationship with staff helps leaders to work with more

efficiently and comfortably. Karakose (2008) studies about leadership skills of principals with reference to gender, age group and socio-economic status and perception of teachers about it and concluded that male principals preferred occupational leadership more than female counterparts. Principals with low socio-economic status found more prone towards lower level of organisational climate with general system of school management while principals with higher socio-economic status found prone to more constructive change school management approach.

Ryans (2007) examined the relationship between principal leadership behaviours and teachers' sense of self-efficacy and result indicated positive correlation between them. Principals have the power to influence many organisational aspects and factors of school. They have a myriad of roles included in their job. One of the most important and influential is the effect the principal has on the teachers and their working system. Fleishman et al., (1991) explained that there are two common classifications of the team behaviour which includes person focused and task-focused. Task-focused behaviour is mainly concerned with the definition of task requirements, the process of the task completion and complete fulfillment of the given task, while person-focused behaviour emphasised on the development of the cognitive issues in individuals and behavioural patterns in individuals before they start working as a team. Keegan et al., (2004) identified the main behaviours that are observed in the traits of leaders such as goal clarification, team boundaries setting, the guidance of members, leading followers, engaging members to the team, meeting organisation and information flow control. Leadership dimensions include guidance, involvement, role specifications along with planning and organising, specifying and organising teamwork. Boyett (2006) mentioned that the role of leaders is crucial in gaining the trust of their subordinates and stimulate their commitment towards the successful fulfillment of the undertaken project.

Role conflict is another aspect to create problems among members of team. Role conflict can result in different undesirable outputs such as lower productivity, damaged relationship and even can lead to absenteeism (Zaid and Vali, 2016). The leaders should have idealised influence. They have to be charismatic and influential. Leaders must execute the tasks with confidence and competence. Leaders should play their role as motivator. Leaders must know how to handle and deal with challenges, persons with differential needs and attitude. Along with it, principals in leadership role must have another important traits such as intellectual stimulation, motivator, creative and innovative approach, transformational attitude, goal clarification, team

boundaries setting, the guidance provider, leading followers, skillful in organisation and information flow control, etc. (Yukl,1994). Viswanathan and Jeevitha (2015) compared the leadership behaviour along with the organisational commitment and its impact on productivity, and explored that organisational commitment and leadership are a must for organisational development and growth.

Joshi and Rani (2017) studied about teacher effectiveness in relation to leadership behaviour of principals of secondary schools and reported that there are no gender differences in relation to leadership behaviour of principals. Both male and female principals are provided equal facilities for better management of schools. The leadership behaviour of school principals positively influences the working effectiveness of teachers Researches by Goldring et al. (2010), Sancar (2009), Coburn (2005) also suggested that leadership skills of administrators put impact on the working pattern and the behavioural approach of the staff. Positive teacher working conditions include fostering collegial, trusting, team-based, and supportive school culture; promoting ethical behaviour; encouraging peers and creating strong lines of communication. Along with it, research studies (Goldring et al., 2010; Umme, 1999; Harris and Spillane, 2008 and Louis et al., 2010) suggested that principals that value and successfully apply research-based strategies are more likely to receive high ratings on instructional climate by developing teachers as leaders outside their classroom walls. Effective principals strengthen the professional community, build better working relationships, and keep their staff engaged in continual learning. For better development and growth, new principals needed to accept and follow previous approaches and traditions of organisation to bring meaningful changes as per the present requirements. In such conditions, the role and responsibilities of school leaders needed to change and they also have to opt new leadership styles to bring such long-term changes in their organisation. It has been thus, explored that the connection between educational leadership and student achievement has always been challenging, however, due to thecurrently available methodologies for measuring leadership behaviour, determining its indirect effects on students achievement has become possible.

Statement of the study

The question of environment or atmosphere or climate is something which cannot be bound within rules and regulations. All these depend on pattern of interaction between the ingredients of the schools' system. School climate, attitude of management and leadership behaviour of administrative officers put impact on the behaviour of the individuals working in the environment, and influences their process or the whole phenomenon. Such environment decides the output or performance of the institutions,

either the teachers' performance or the learning aspects of the students. Today, schools are working under highly competitive scenario and they need to have passionate, qualified and active administrator as well as teachers for the organisational progress. The strength and impact of the organisational climate helps teachers to perform well under the expert guidance and management, hence, the need is felt to conduct survey on leadership behaviour of secondary school principals to understand their leadership skills and abilities. Organisation climate and leadership behaviour of administrators are powerful forces and play pivotal role in the all-round development of any organisation. Hence, the researchers felt the need to study the leadership behaviour of secondary school principals. The statement of the study is as follows—A Study of Leadership Behaviour of Secondary School Principals.

Objectives of the Study

- To study the leadership behaviour of secondary school principals.
- To compare the leadership behaviour of secondary school principals on the basis of type of institution, gender and locality.

Hypotheses

For attaining objectives of the present study, following hypotheses have been formulated.

- There is no significant difference in the leadership behaviour of government and private school principals.
- There is no significant difference in the leadership behaviour of male and female principals of government and private schools.
- There is no significant difference in leadership behaviour of rural and urban, government and private school principals.

Design of the Study

All principals of the secondary schools situated in Bareilly district constituted the population of the study which covers both male and female principals of government and private schools situated in urban and rural areas of Bareilly district. By using random sampling method, the sample of the present study has been chosen which consists of 100 principals (50 male and 50 female) of 100 schools of Bareilly district. To collect data, leadership behaviour Scale developed by Hinger (2005) has been used which contains 30 items to measures six domains of school principal leadership skill: emotional stability, group formation, productive tasks, skill development, and social intelligence and value orientation. The tool is highly reliable and valid. By using split half method, the calculated reliability coefficient is 0.69, and the construct validity of the tool is 0.49.

Analysis and Interpretation

Table 1
Mean Scores of Government and Private School Principals on Leadership Behaviour Scale

Groups	N	Mean	S.D.	t value (df=98)
Government School Principals	50	124.87	15.35	5.29**
Private School Principals	50	126.54	13.32	

** .01 level of significance

Table 2
Mean Scores of Male and Female School Principals on Leadership Behaviour Scale

Groups	N	Mean	S.D.	t value (df=98)
Male Principals	50	127.76	12.18	9.12**
Female Principals	50	130.45	10.50	

**.01 level of significance

To test the first hypothesis that there is no significant difference in leadership behaviour of government and private secondary school principals, mean scores, standard deviation and t value have been calculated (Table 1). The mean of the government school principals is 124.87 (15.35) while the mean value for their counterparts is 126.54 (13.32). The calculated t value found 5.29, which is significant at .01 level of significance. Comparison between mean values of group shows that in case of private school principals, mean value is higher than the government school principals which reveal that administrators working in private school shows higher level of leadership behaviour than government school administrators. Private counterparts were found to be more efficient and capable than government administrators. This may be due to the availability of facilities which help them to work smoothly and efficiently, hence, the first null hypothesis is fully rejected. The result of the present study is found to be similar to Chopra (1982) who also found significant difference in the leadership behaviour of government and private school principals.

To test the second hypothesis that there is no significant difference in leadership behaviour of male and female principals, mean scores, standard deviation and t value has been calculated (Table 2). The mean of male principals is 127.76 (12.18)

while the mean value for female counterparts is 130.45 (10.50). The calculated t value between the groups is found 9.12, which is significant at .01 level of significance. Comparison between mean values of group shows that the mean values in case of female principals is higher than male principals which reveals that female administrators are more capable rather than male counterparts. Female have shown higher level of leadership behaviour rather than male principals. This may be due to natural traits of females which enable them to be more responsible and active in decision making, and sound in leading any organisational role. Hence, the second null hypothesis is also fully rejected as significant differences has been depicted in the leadership behaviour of both male and female principals which is the result of their basic nature. The result of the present study is found in tune with Portin (2004) and Hallinger (2004), and Fullan (2010) who explored significant differences on leadership behaviour of leaders on the basis of gender and locality.

To test the third hypothesis that there is no significant difference in leadership behaviour of urban and rural school principals, mean scores, standard deviation and t value has been calculated (Table 3). The mean of the urban school principals is 127.75 (11.97) while the mean value for their counterparts is 127.60 (11.63). The calculated t value between the groups is 3.01, which is significant at .01 level of significance. Comparison between mean values of the group shows that the mean values in case of urban school principals is little bit higher or almost similar than the rural school principals, which reveals that administrators working in rural or urban locality are similar in their leadership behaviour. Such results reveal that locality doesn't matter in any administrative working system. Smooth administration can be done in any type of surrounding or atmosphere. Hence, the third null hypothesis is also fully rejected as the atmosphere and difference in facilities or conditions of urban and rural areas are completely different, but it does not put impact on the working style and behavioural approach of leaders positively. The result of the

Table 3
Mean Scores of Urban and Rural School Principals on Leadership Behaviour Scale

Groups	N	Mean	S.D.	t value (df=98)
Urban School Principals	50	127.75	11.97	3.01**
Rural School Principals	50	127.60	11.63	

** .01 level of significance

present study is found in tune with Hallinger and Heck (1998); Portin (2004); Viswanathan and Jeevitha (2015); Harris and Spillane, 2008 and Dembowski (2008), who explored significant differences on leadership behaviour of school principals on the basis of gender and locality.

Result and Discussion

Another important factor for school administrators is related to creation of cool, easygoing and comfortable working area for which they have to build strong network, wide and useful social circles so that they may be able to balance and manage their responsibilities. They interact with student, parents, and administrative officers. They have to deal with situations with more managerial competencies and expected to push teachers to work, emphasise on output in terms of higher pass-percentage, foster community relationship, prepare appropriate instructional material and aids, help improve instructions by working with teachers, organise pilot studies and action research, help teachers through capacity building, ensure good relationship and staff morale. School leaders have to deal with various problems and resolve problematic issues quickly and in practical manners. Sharma (1982) also reported that the primary function and responsibility of school principals is to manage discipline in academic organisations also. In these formal and informal settings, administrators have to face variety of problems because of administrative demands and expectations along with conflicting situations and challenges. As a social organisation, schools are responsible not only for employees but for the external environment (nature, environment and society) as well (Chopra, 1982; Hallinger and Heck, 1998; Harris and Spillane, 2008).

The results of the present study are found in tune with research studies by Chernow (1985), Lam (2003) and Hallinger (2004) who explored, that principals of government and private schools are changing their approach. Another aspect is the changing approaches on gender basis as the various groups of principals have shown significant differences on leadership behaviour, which draws differences in management style of male and female counterparts which is the common phenomenon of our society. The pictures are changing as principals associated with rural background or zone, now associating themselves with urban areas trends and adopting the changed environment so that the young generation educators are nurturing themselves as per the urban approach of social development. They are adopting the recent trends and changing their mindset for developing more progressive society, hence the situation is changing. The differences of the data may be due to controlled environment of management of school personnel or the working environment. The result

of the present study supports that the educational structure, system and nurturing style of individuals also put impact on development of leadership skills and behaviour (Umme, 1999).

Young principals or new entrants have potential to bring positive changes with their innovative leadership style. Either there may be difference of opinion among the group of people regarding some issues and challenges, but all of them are associated with a common system of educational management and administration. The working paths of government and private schools, urban and rural school, and male and female school principals can differ but the destination is the same. A positive administrative environment with a lot of bold leaders with social support from parents, teachers, peers and family, and other higher authorities directly or indirectly need to be established for the development of any institution. Both the government and private sector has to take initiative with reference to all stakeholders, to reform the societal approach; organisational structures, curriculums; training patterns, adoption of interdisciplinary curricular and co-curricular activities.

Research priorities in current and future sociological aspects are needed to bring such positive changes in this direction. Educational researches must include leadership skills with reference to practical approach, willingness and societal norms and standard. Such approach would provide a new vision for leadership development and create new bond with the administration and faculty members also. Interdisciplinary researches may be more helpful, especially in long-term and intensive studies on developing various aspects of behavioural and communication skills. Researches in such priority areas should be encouraged and supported by the government. Formal training (both online and offline) and enhancement in educational qualifications is needed for school principals (Govinda and Bandyopadhyay, 2006). More academic facilities must be provided for the school leaders for their studies in the field of educational leadership, especially at master and doctorate level. Short term courses and distance education courses on organisational management and educational management leadership can be introduced for administrators. Policymakers and practitioners should develop the management systems that develop a holistic approach towards performance that are suitable for implementation in the school education and administration contexts. Research orientation is also important for updation in the administrative field and its linkage with school education. Research studies especially action researches, in the field of defining, modifying school administrator's role and its impact on teaching-learning process and working conditions can be carried out and implemented. Along with it, for better planning and administration, resource, staff, and ample opportunities for school principals should be provided to improve their leadership skills and behaviour (Harris and Spillane, 2008).

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Mathematics has to be Taught the Way Mathematics is

G.RAVINDRA*

Abstract

Mathematics is a study of sets, where a set represents a property which is either true or false. One of the vastest areas of world of contemplative beauty is Mathematics. This alone is a sufficient reason for study of Mathematics (King, 1997). There are people who perceived Mathematics as dogmatic, inflexible and dull. But the fact is that the basic elements of Mathematics are rare combinations: logic and intuition, analysis and construction, generality and individuality, precision and beauty. Harmony (order) and non-discriminatory approach (for every), in Mathematics emphasised the value of peace in societies. The Education Committee (Kothari 1964–66) recommended Mathematics as a compulsory school subject for all school students. NCF-2005 emphasises that Mathematics should be visualised as a vehicle to train a child to think, reason, analyse and articulate logically. There are instances where Mathematics is taught differently—fundamentals are not given due importance, mathematical results are conveyed through authoritative communication, proofs and theorems are replaced by illustrations or inductive arguments (solving only routine problems with main emphasis on drill). Keeping these in mind, in this article we discuss some innovative methods of teaching Mathematics which are some combinations of: Venn Diagrammatic Approach, Mathematical Modeling, Mathematics Lab, Problem Solving (including non-routine problems), Index of Teaching, Action Research in Mathematics, Feeling and Aesthetics in Mathematics, Historical Approach.

INTRODUCTION

Mathematics is essentially a study of sets and their interrelations, where, a set represents a well-defined property – a property which is either true or false. Mathematics links abstract ideas to physical things; and creations in mathematics are

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observable and provide aesthetic experience. "One of the vastest areas of world of contemplative beauty is mathematics. This alone is sufficient reason for study of mathematics" (King, 1992). There are people who perceived mathematics as dogmatic, inflexible, and dull. But the fact is that basic elements of mathematics are rare combinations, viz., logic and intuition, analysis and construction, generality and individuality, precision and beauty. Further harmony (order) and non-discriminatory approach (for every) in mathematics emphasises the value of peace in societies.

National Curriculum Framework, 2005 (NCF, 2005) emphasises, "Mathematisation (ability to think logically, formulate and handle abstractions) rather than 'knowledge' of mathematics (formal and mechanical procedures) is the main goal of teaching of mathematics".

Keeping these fundamental aspects of mathematics in mind, any method or strategy of teaching-learning of mathematics has to be evolved. There are instances where mathematics is taught differently — fundamentals are not given due importance, mathematical results are conveyed through authoritative communication without a justification, proofs of theorems are replaced by illustrations, indicative arguments, or 'empirical induction', solving only routine problems with main emphasis on drill.

Here, we discuss some of the innovative methods of teaching mathematics which are a combination of – Venn diagrammatic approach, mathematical modeling (application of mathematics), mathematics lab, problem solving (including non-routine problems), action research in mathematics, historical approach, feeling of aesthetics in mathematics.

Ultimately any teaching-learning of mathematics has to provide an active experience in Mathematics.

Mathematics education is mainly concerned with teaching-learning of mathematics. For effective and meaningful teaching-learning of mathematics, mathematics education has to seriously deal with constructive invention, motivating intuition, applications and aesthetics within the framework of 'deductive form of mathematics'. There is a poor response to mathematics education at higher education level. Mathematics education at school level has to answer, "does the content of mathematics and associated methodology stimulate students to continue in mathematics courses?"

There is hardly any discipline of study without the numbers. The Education Commission (Kothari 1964–66) recommended mathematics as a compulsory subject for all school students. Thus, mathematics enjoys unique status in a school curriculum. The National Policy on Education (1986) also emphasises that mathematics should be visualised as the vehicle to train a child to think, reason, analyse and articulate logically. Apart from being a specific subject it should be treated as concomitant to any subject involving

analysis and reasoning. And yet many school students find difficulty with learning of mathematics and fail in mathematics. A major reason for the failure is that the practitioners of curriculum quite often forget the basic assumptions: there is no learning without fundamentals, mathematics should be taught the way mathematics is.

There is a huge gap between prescription and practice of a mathematics curriculum. Most of the time, mathematics classroom is preoccupied with routine teaching and not much time is devoted to learning of mathematics. Hardly a student asks questions in a mathematics classroom. The teacher-training colleges in India prepare the mathematics teachers at secondary level, and paradoxically most of the teacher-training colleges do not have teacher educators with mathematics as a subject at their degree level, or experience of teaching mathematics at school level. Many of the teachers do not distinguish between teaching of mathematics and teaching of science, and often-inductive arguments replace proofs of theorems. Many of the mathematics teachers at secondary level do not understand mathematics, as is evident from the fact that more than 90 per cent in in-service programmes conducted for teachers at RIE Bhopal and Mysore during 1998–2000 did not answer correctly.

(i) Why is it that the product of two negative numbers is positive?

(ii) What is the number after ½?

(iii) Why cannot addition replace multiplication?

A mathematics teacher has to love mathematics, understand mathematics and believe that mathematics is important.

Activities and researches in mathematics education at higher level are almost nil. Vision 2020 for School of Mathematics, Tata Institute of Fundamental Research, TIFR (Paranjape, 1995) also states "The job of teaching and exposition is one area where TIFR has not contributed much as yet. One of the disturbing aspects of mathematics education in India, and also the rest of the world is that of the lack of mathematical sophistication in the education provided to non-mathematicians. Most of the mathematics taught to non-mathematicians centers around the development of the previous century."

Keeping these in view, some of the important issues that promote innovations in teaching-learning of mathematics at school level are the following:

Proofs

"Mathematics is the study of assertions of the form 'p implies q' where p (assumption) and q (conclusion) are each statement about objects that live in mathematical world" (Bertrand Russel, 1917). A proof in mathematics is a deductive process that connects assumption (p) to conclusion (q) by a logical reasoning. "A proof is a construction

that can be looked over, reviewed, verified by a rational agent and the mathematician surveys proof in its entirety and thereby comes to know the conclusion" (Thomas Tymoczko, 1979). But there are distortions for the concept of proof. One of the main reasons for the distortions is due to undue importance given to functional mathematics. Quite often, inductive arguments replace proofs. For example, 3,5,7 are first three consecutive odd numbers and primes, but every odd number is not prime. Similarly, the theorem that the sum of the angles in a triangle is 180° cannot be proved by actually measuring the angles of the triangle. If $F(n)=2^n+1$, F(1)=5, F(2)17, F(3)=257, F4=65537 which are all primes but F(5)=641.6700417 is not prime (Euler,1732). Proof requires generality.

Appel and Haken of the University of Illinois proved using a computer the famous Four Colour Conjecture which remained open for 124 years. They produced a new kind of proof which many pure mathematicians have taken with a pinch of salt. What if the computer erred?

"Appel and Haken may have given us a glimpse of the future. A future in which deep theorems routinely will rely for their proofs on the checking of millions of special cases by high speed unmonitorable computers and I gather it is a future they welcome. It is a future without elegance, a world of disfigured mathematics. Truth may choose to live in that world, but beauty will not" (Kingh, 1992)

Now, let us find an answer to the question: Why is that the product of two negative numbers is positive? The proof is unique, interesting and elementary. But what is puzzling is that many students learn the fact by authoritative communication from teacher to student. The proof is as follows: For any two real numbers a, b, let

X=ab+(-a)(b)+(-a)(-b)

(i) X=ab+(-a)(b)+(-a)(-b)

(Distributive Law)

=ab+(-a).0(Additive Inverse)

=ab+0=ab. (z.0=0, and identity)

ii) X=(a)+(-a)b+(-a)(-b)

=0.b+(-a)(-b)

=0+(-a)(-b)=(-a)(-b)

(i) and (ii) imply

ab=(-a)(-b)

Proofs provide an excellent mathematical memory— a memory due to understanding generalisation, formalised structures, logical schemes.

We need to encourage students to give alternative proofs. For example, the statement: 'the sum of first n natural numbers is n (n+1)/2' can be proved by mathematical induction or by writing the series in increasing and decreasing fashion and adding the series (Gauss's way). Some of the students could also try to prove this by contra positive method.

In short proofs in mathematics are fundamental components of mathematics education and they form 'quality' of mathematics education.

Aesthetics in Mathematics

The famous four: Cognitive (Truth), Metaphysical (Reality), Ethical (Justice), Aesthetical (beauty) are great classical components of Philosophy (of liberal education and core curriculum). These four fundamental issues establishes progress and procedures toward quality education.

Aesthetics (beauty) is an integral part of quality in education, and yet many of our educational processes do not include the aesthetics part. Aesthetics is undoubtedly one of the highest qualities of life.

While aesthetics is mainly derived from infinite collections (combinations-patterns), it is difficult to find examples of infinite collections from the real physical world. The natural numbers (counting numbers), which are the first experience in mathematics, is an excellent example of an infinite set. Mathematics is full of infinite sets and excitement. There is a deep sense of aesthetic pleasure that one can derive from mathematics (of course, art, music, and literatures are common source of aesthetics). In fact, mathematicians do mathematics for aesthetic reasons. The proofs (as evidence) in mathematics quite often create excitement (as they exhaust infinite possibilities) leading to aesthetic pleasure.

We quite often study mathematics in a routine way, which is dull, and without any excitement. For many of the mathematics students, the difference between Riemann integral and anti-derivative is that one of them is evaluated between two limits. They do not see the Fundamental Theorem of Calculus as a relation between 'area' and 'tangent' (two unseemingly related concepts). In this connection, King's (1992) recollection of his college calculus experiences is worth noting: "One full year passed after elementary calculus before we learned the true relation between Riemann integrals and ant-derivatives. We discovered that the connection between these very different notions lies at the very heart of the subject, and that it is one of the genuinely great creations of human intellect. We saw that the connecting argument is a thing of great beauty. Suddenly, we understood that mathematics has an aesthetic value as clearly defined as that of music or poetry."

One of the vastest areas of the world of contemplative beauty is mathematics. This alone is sufficient reason for study of mathematics (King, 1992).

Mathematics possesses not only truth, but supreme beauty— a beauty cold and austere like that of a sculpture without appeal to any part or weaker nature, sublimely pure and capable of stern perfection such as only the greatest art can show (Bertrand Russel).

Despite an objectivity that has no parallel in the world of art, the motivation and standards of creative mathematics are more like those of art than of science. Aesthetic judgments transcend both logic and applicability in the rankings of mathematical theorems: beauty and elegance have more to do with the

value of a mathematical idea than does either strict truth or possible utility (Lynn Steen).

The ideas brought forth from the unconscious and handed over to the conscious invariably possess the stamp of mathematical beauty (Poincare).

Aesthetic Experience' variables (George David Birkhoff, 1956)

Birkhoff identifies three typical "aesthetic experience" variables: the complexity (C) of the art object, the harmony or order (O) of the object, and the aesthetic measure (M) of the object. He asserts that these variables are related by the basic formula.

M=O/C

(If complexity is less and order is better, then the aesthetic measure is better. Further, if complexity tends to infinity, then the aesthetic measure tends to zero).

Principle for Aesthetic Quality *(King, 1992)*

King proposes two principles, which gauge aesthetic quality of a mathematical notion.

Principle of Minimal Completeness

A mathematical notion N satisfies this principle provided that N contains within itself all properties necessary to fulfill its mathematical mission, but N contains no extraneous properties.

Principle of Maximal Applicability

A mathematical notion N satisfies this principle provided that N contains properties, which are widely applicable to mathematical notions other than N. (here a notion means theorem proof, equation in-equation or definition).

For example, the process of division 64/16=4 (canceling the 6's) appear to be neat. Yet it has no mathematical value— aesthetic or otherwise, because the method has no applicability beyond itself. Euclid's proof of infinitude of prime numbers (n=1 + p1p2 ...pn) satisfies both the principles (the primes are not restricted and have wider applicability in the theory of numbers and the proof is complete in itself). Similarly, Pythagorean proof of irrationality of J2 satisfies both principles. Thus, both of these are 'elegant' and have aesthetic quality.

Mathematical Modeling

A mathematical model is a simplified mathematical representation of a real situation with a mathematical system (a model is something which represents something else). Although a real situation involves a large number of variables and constraints, usually small fraction of these variables and constraints that truly dominates the behaviour of the real system, and identification of such variables and constraints is one of the purposes of mathematical modeling.

The set of natural numbers with usual addition and multiplication form a good mathematical model of real situations concerned with counting process. Vectors are excellent mathematical models that

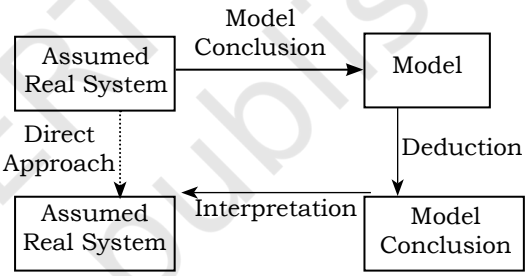
predict and explain many physical phenomena with perfect accuracy. The concept of direction, which is so vague in the physical world is precisely explained by identifying the concept of vector as that of location or coordinate system (Such an identification is guaranteed by the famous result that every finite dimensional vector space is isomorphic to Euclidean space R"). Graphs, (Networks) as mathematical models, cover a wide range of real situations, as they are highly generalised algebraic structures.

Mathematical models are normally thought of as an instrument for selecting a good course of action from the set of courses of action that is covered by the model (here a course of action could be a strategy of selecting a content or some such thing). However, the models have another very important use: they can be used heuristically (that is an instrument of discovery). They provide an effective tool with which one can explore the structure of a problem, and uncover possible courses of action that were previously overlooked. For example, vectors as models have led to discovery of several outstanding and useful results in the vector space theory. The models concerned with drawing of implication diagram (Venn diagram) of given concepts give rise to some very interesting conjectures and their solution later.

Process of Modeling

The process of modeling is depicted in the following figure.

The first step is formulation of the model itself. This step calls for identification of assumptions that can and should be made, so that the model conclusions area as accurate as expected. The selection of the essential attributes of the real system and omission of the irrelevant ones require a kind of selective perception which is more an art than a science,



and which cannot be defined by any precise methodology.

The second step is to analyse the formulated model and deduce its conclusions. It may involve solving equations, finding a good suitable algorithm, running a computer program, expressing a sequence of logical statements, whatever is necessary to solve the problem of interest related to the model.

Mathematical modeling plays a great role in teaching Mathematics

Some of the most important components of teaching a concept in mathematics are:

(i) Motivation for the concept

(ii) Simplification of the concept

(iii) Problem solving

Motivation for learning a mathematical concept may be within the mathematics itself or outside the mathematics and a real-world situation. For instance, it is very difficult to choose an example of an infinite set from a real-world situation; so, in such a situation, the set of natural numbers can be taken as a motivating factor for the concept of 'infinite sets'. On the other hand, a great deal of real world motivates and exemplifies several concepts like vector, derivative, integral, etc.

By simplification of a concept C, we mean breaking of the concept C into simpler sub concepts, or more precisely, it is an identification of meaningful restrictions on C such that Ci (the restricted C) has a simpler characterisation than that of C. Once a concept is simplified into Co, C2.., Cg one is naturally tempted to find various inter-relations among the sub concepts Ci, and that is how the concept C in particular and mathematics in general become richer.

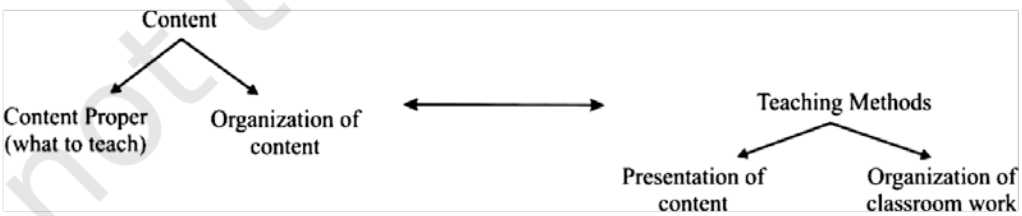
Problem solving heavily depends upon the data of the problem (conditions or assumptions of the problem) and formulation of the problem (mathematical modeling). Mathematical modeling cuts across all the above three components, and each in turn is greatly facilitated by mathematical modeling.

Content in mathematics can be analysed into content proper (what to teach) and its inner organisation, the latter being most closely related to teaching methods.

Teaching methods can be analysed into presentation of the subject matter (use of mathematical models, etc.) and organisation of classroom work, the former being most closely related to content and mathematical modeling. The analogue model of this para is as follows:

Venn Diagrams

Mathematics is a study of sets where a set is identified with a 'precise property', a property that is either true or false, not both. But strangely the sets do not find the right kind of importance in the teaching-learning process of mathematics in school education. In the process of making mathematics more functional, the most fundamental element

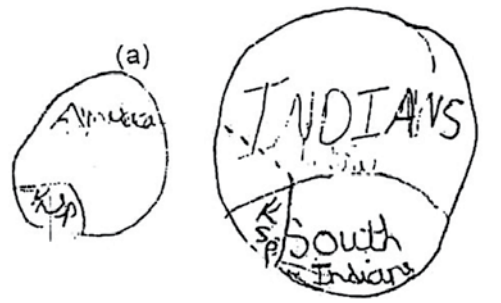


of mathematics "Set" is not used properly as it should have been.

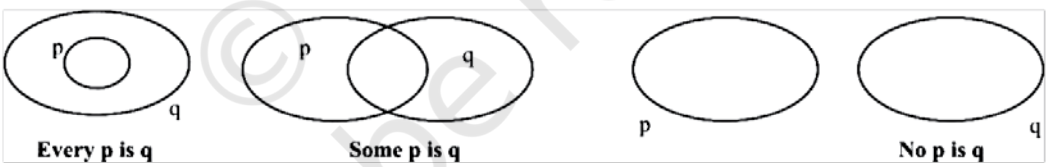
John Venn introduced Venn diagrams in 1880. A Venn diagram represents pictorial inter-relations among sets (well-defined properties), each of which is denoted by a closed region without holes. Though there are other diagrams like line diagram directed graph, etc., to illustrate relationships, Venn diagram has an advantage of space over the others. Given two well-defined properties p, q, the possible relations between them can be represented by Venn diagram in one of the following ways.

Venn Diagrammatic Representation Approach (VDRA) could best be employed in

- better understanding of mathematics because of their visual effect;
- providing clarity in teaching-learning of mathematics;



While transacting mathematical content, VDRA is quite helpful in making teachers' ideas clear and also helps in vivid presentation of the content by reducing the verbal statements. It is necessary for them to focus on different components of VDRA (both separately and collectively) giving adequate opportunities for the students to make mathematical representations and think all plausible relationships while solving any of the mathematical problems.



- finding inter-relations among mathematical properties holistically and accurately, and better analysis of the properties; and
- "Conjecturing" as a consequence of natural creation of some new portion in Venn diagram.

An example of creativity shown by the child (Jagdish of Grade V of DMS, Mysore).

(For more details see the use of Venn Diagrams in teaching-learning of Math, by G. Ravindra School Science, September 2002).

Mathematics Laboratory

Mathematics Laboratory is a place where some of the mathematical activities are conducted. Mathematics labs promote learning by doing and

popularise mathematics. Mathlab could be an excellent vehicle of pedagogy of mathematics.

Illustration of some mathematical ideas using a computer or a model, preparation of teaching aids, verification of proofs without affecting deductive nature of mathematics, application of mathematics to other disciplines, etc., can be effectively carried out in math labs. It would be an amazing experience to observe that it is not possible to change the shape of a triangle formed by three sticks loosely fixed at the three corners while the same is not true for shapes of quadrilaterals, pentagon, etc. The students would have real excitement when they recall the theorem that two triangles are congruent (same) when the sides of one of them are equal to the corresponding sides of the other. NCFSE-2000 visualised setting up of math labs in the existing science laboratories and converting the existing science laboratories into science cum mathematics laboratories. NCF-2005 also stresses the need of math labs. Now, there are quite a few schools in the country who have come forward to introduce mathlabs.

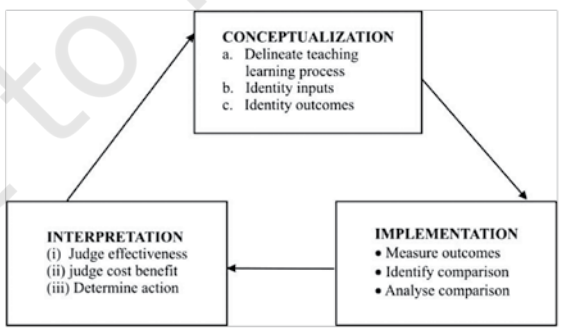
Action Research in Mathematics

Action research is the process of systematically evaluating the consequences of educational decisions and adjusting practice to maximise effectiveness. This involves teachers and school principals, delineating their teaching and leadership strategies, identifying their potential outcomes and observing whether these outcomes do indeed occur. Essentially, action research is examining one's own practice. Action research has the potential to improve practice and provide teachers and principals with deeper understanding of teaching process. At the very least, it provides a process for weighing educational alternatives and making decisions.

Action Research Model

(For details see "Improving Education through Action Research", James E. Mc. Lean Corwin Press INC, A Sage Publications Company, Thousand Oaks, California, 1995)

For example, let us simulate the famous Konigsberg Seven Bridge Problem ("Graphs", Claude Berge, North Holland, 1985) to illustrate



action research in mathematics. The problem is staged as follows.

The city of Konigsberg (today known as Kaliningard) is divided by the Pregel River that surrounds the island of Kneiphof. There are seven bridges in the city as shown in the following figure. Can a pedestrian traverse each bridge exactly once? This problem puzzled the residents of Konigsberg until Euler showed in 1736, that no solution exists.

With the help of the students and using coloured chalk powders, a teacher could draw a huge analogue sketch of the above Fig. 1 on the surface of the school ground, distinctly marking the water of Pregel river by blue chalk powder and the seven bridges replaced by yellow pathways. a, b, c, d would represent the land portions of Konigsberg. Then the play begins. Each of the students makes several attempts to traverse each of the yellow strip exactly once without stepping into the blue portion starting from 'a' and back to 'a'. The teacher permits them to repeat the same from b to b from c to c or from d to d. Then a puzzling question: "why cannot we?" direct them to a solution. The teacher helps each of them to draw the network as shown in the Fig. 2. Perhaps some of them possibly start thinking like Euler, that the odd number of edges at a, b, c, or d creating an obstacle in their traverse. So, the teacher has done his job.

Practice is the hallmark of action research. Mathematical modeling, mathlab, venn diagram, and alternative proofs could effectively be used as action research strategies and processes.

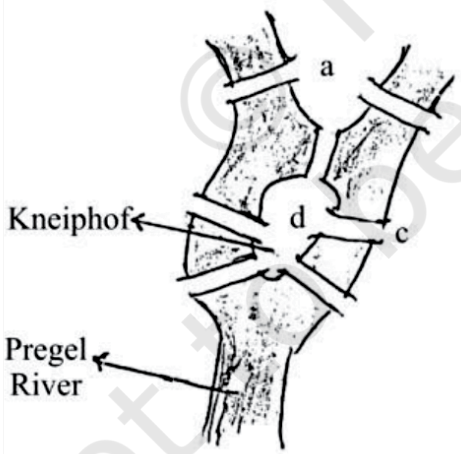
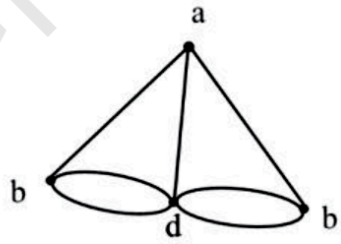


Fig. 1



Network (or graph)
a, b, c, d are land areas and edges are the connecting bridges

Fig. 2

Problem Solving

The ultimate aim of learning mathematics is to be able to solve problems. The problems stated in textbooks are generally "routine problems", which are characterised by mathematical tasks— computational exercises, applying formulas, using algorithms, solving verbal (word) problems. Non-routine problems have no readily available procedures, and generally a solution is obtained by using mathematical concepts. In connection with non-routine problems, Homi Bhabha Centre for Science Education is doing a great job by organising Mathematics Olympiad programmes (including training) for school students. The International Mathematics Olympiads (IMO) has a significant impact on the mathematical education of several participating countries and also on the gifted children and their pedagogical benefit is undeniable. For example, to get a feel of the problems in IMO, we list two of them.

(1985) — A circle has center on the side AB of the cyclic quadrilateral ABCD. The other sides are tangents to the circle. Prove that AD + BC=AB.

(1991) — Let S = {1, 2, ---..., 280}. Find the smallest integer n such that each n-element subset of S contains five numbers which are pair-wise relatively prime.

Though there are different viewpoints regarding instruction in problem solving, one of the most lucid model for problem solving is given by the mathematician George Polya in his book, 'How to Solve It' (Princeton University Press, 1973). His problem solving model is as follows:

First	-	Understanding the problem
Second	-	Devising a Plan
Third	-	Carrying out the Plan
Fourth	-	Looking Back

Index of Teaching

Index of Teaching I(T): the number of questions asked by distinct students in a classroom per period. I(T) is closely related to the capability of a teacher to motivate the child to learn. In an experiment conducted in 10 classrooms of schools of Sandur (Karnataka), I(T) was found to be almost zero, implying almost no Learning. I(T) has to be normally at least 5. I(T) can be self-monitored by the teacher and it can do wonders to promote student-centered learning.

History of Mathematics

Mathematics started growing open endedly from eighteenth century B.C. with the contribution of Egyptian priest Ahmes. His contribution included problems in Geometry and the contributions are treasured in the Rhind collection at British museum, ('The Great Mathematicians' H.H. Turnbull, May 1951).

India has a rich mathematical heritage; an instrument was actually used for drawing circles in The Indus Valley as early as 2500 B.C. (Mackey 1938). Aryabhata I (475 A.D.), Brahma Gupta (Seventh century), Mahavira (850 A.D.), Bhaskara II (1150 A.D.), Madhava (Fourteenth

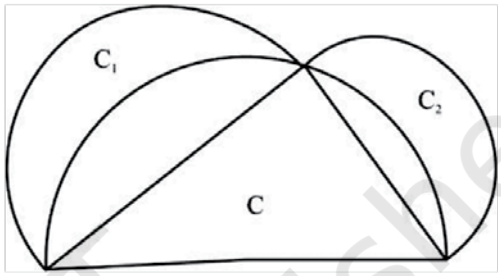
century), Ramanujan (1887–1920) have made significant contribution to world of mathematics. Ramanujan is considered to be the greatest mathematician of 20th century.

Through the history of mathematics, one can see how a mathematician thinks and how his imagination helps the 'development of mathematics'. Thus, the history of mathematics has an important pedagogic value. History of great mathematicians and their great creations has to be a part of mathematics curriculum, both at school and higher education level.

Examples

1. In trying to square the circle (i.e., finding as square whose area is equal to that of a given circle), Hypocrates (Greek mathematician during fifth century B.C.) discovered that two moon-shaped figures could be drawn whose areas were together equal to that of a right-angled triangle. Please see the following figure. This was the first example of a solution in quadrature's (i.e., constructing a rectilinear area equal to an area bounded by one or more curves). The sequel to attempts of this kind was the invention of Integral Calculus by Archimedes (287–212 B.C.). Apart from this problem, 'Duplication of the cube', 'Trisection of a given angle' encountered by the Greek mathematicians during fifth and fourth centuries B.C. These three problems eluded solution for several centuries (nearly twenty-five centuries) and ultimately a solution was found in nineteenth century A.D. Surprisingly, the solution was Algebraic, though the problems belonged to geometry.

$C=C_1+C_2$ (Hippocrates, 5th Century BC)



2. As HW Turnbull puts it, Carl Friedrich Gauss (1977–1555) was the last complete mathematician. Gauss pointed out to his father an error in an account when he was three. There was an interesting anecdote associated with Gauss. When Gauss was eight, he and his classmates were asked by their teacher to find the sum of the first hundred natural numbers (the teacher wanted to take some time off from the class and perhaps thought that this could be a teaser to hold them in the classroom till he came back). Gauss instantly wrote the answer as 5050 on his slate and handed it to the teacher, before the teacher could leave the room. Gauss arranged mentally the numbers 1, 2,...., 100 in pairs (1, 100), (2, 99),...,(50, 51). There exactly 50 and the sum of the numbers in each pair is 101. Hence the desired number is 50 times. The whole process took him just a few seconds.

The Prime number theorem states that when n is a large number, the result of dividing n by its logarithm gives a good approximation to the total number of primers less than or equal to n. Gauss knew this and it is not known whether Gauss proved this. This is manifestation of amazing genius of Gauss, and an example of the highest kind of intuition. It took almost a century to prove the statement of Gauss's conjecture. In 1896, Hadmard and Va1lee Poussin proved independently the Prime Number Theorem. This startling result provided a seemingly unrelated connection between the discrete mathematics of whole numbers and the continuous mathematics involved with the logarithm. This is a real joy.

3. Srinivas Ramanujan (1887–1920) was undoubtedly one of the greatest mathematicians of the twentieth century. He was a self-taught genius and highly creative, guided by imagination and intuition of the highest order. "What Mozart was to music and Einstein was to physics, Ramanujan was to mathematics" (Clifford Stok). Many are familiar with the famous taxi-cab number story told by Hardy. "I remember once going to see him when he was lying ill at Putney. I had ridden in a taxi cab no. 1729, and remarked that the number seemed to me rather a dull one, and that I hoped it was not an unfavourable omen. 'No', he replied, 'it is very interesting number; it is the smallest number expressible as sum of two cubes in two different ways". The two ways are: $12^3+1^3=1729=10^3+9^3$. Ramanujan offered an approximation to viz.,

$= (97½ - 1/11)^{1/4} = 3.1415926526$----.

What's amasing is 'the way Ramanujan was thinking'. He hardly had any access to any of journals in mathematics. He used to read less and think more. Intuition is hallmark of Ramanujan.

Many of the great mathematicians did their best work when they were relatively young. Hardy made a remark 'Mathematics is a young man's game'. A mathematics teacher will have to understand mathematics and teach young children mathematics the way mathematics is, so that they get interested in mathematics and mathematics grows.

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Sensitisation of Student-teachers towards the Direct Teaching of Thinking

NALINI PATIL* AND PALLAVI DALVI**

Abstract

This study attempted to sensitise student-teachers towards the direct teaching of thinking based on Edward De Bono's CoRT thinking tools. The sample consisted of student-teachers of B.Ed. programmeme. The student-teachers were introduced with the first module of CoRT thinking programme. Five of the student-teachers voluntarily participated further into facilitation of the Direct Teaching of Thinking (DTT) Programme designed to bring in life skills changes for 8th standard students. The paper discusses content understanding of the student-teachers who participated in the sensitisation programme. The data collected in the form of reflections from the student-teachers, is analysed through, the thematic analysis. The analysis revealed that the DTT programme improves communication and interpersonal relations of the student-teachers with their students. The student-teachers felt more confident to use the tools in their subject lesson after the exposure. The thinking programme based on CoRT is relevant not only to be taught in schools but also in teacher education programmes for improvement of teachers' skills.

INTRODUCTION

In the era of advanced technologies, there is an unparalleled wealth of information streaming through the digital devices of every human being, which may lead to stress and a state of confusion for many. A critical ability to identify the appropriate applications of this information can only bring in enhancement of the real-life situations.

The purpose of education is to prepare students for a life beyond school. Education system plays a

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vital role in the learning environment for learning of an individual. As stated by Dr. S. Radhakrishnan, "The end-product of education should be a free creative man, who can battle against historical circumstances and adversities of nature" (Kalaiselvi R., 2016). To prepare the students for effective thinking, teachers themselves need to be effective thinkers. This ability can be acquired through the practice of various complex order skills of thinking such as critical thinking or problem solving. Developers and researchers of many effective programmes on teaching thinking skills claim teacher training to be a key element in the success of such programmes (Cotton, 1991). This minor research study was taken up while conducting a training programme for the facilitators of a 'Direct Teaching of Thinking' (DTT) programme developed for 8th grade students. The DTT programme was based on the ten CoRT thinking tools given by Edward de Bono for the first time in 1973, at the Cambridge University. The focus of DTT programme was on enhancement of life skills as listed by World Health Organization (WHO). This research aim towards studying the changes that are subsequently observed during and after the facilitator's training programme, amongst the student-teachers of B.Ed.

The reviewed literatures, shows application of CoRT programme in the branches of Social Studies such as Geography, National and Civil Education, and History. Also, their effects studied in developing critical thinking (Al-Edwan, 2011; Rabbo, 2019). CoRT Programme was found to be appropriate to stimulate the originality, fluency and flexibility which develops better critical thinking, creative thinking, comprehension skills as well as communication skills. (Al-Faoury and Khwaileh, 2014; Alshurman, 2017; Rabbo; 2019). Rabbo (2019) even suggested developing the teacher competencies through the training on CoRT programme.

The Department of Mental Health, WHO (1999) identifies life skills across different cultures into five categories:

- Decision making and problem solving
- Creative and critical thinking
- Communication and interpersonal skills
- Self-awareness and empathy
- Coping with emotions and coping with stress

Literature also cites that acquired skills such as communication ability, awareness of self-capacities or interests, further aid to transform the imbibed values into appropriate attitude. Thus, life skill changes can be brought through training programmes for the student-teachers. (Kalaiselvi, R., 2016; Helaiya, S., 2010). Such life skill changes can develop psychosocial skills that are required to deal with the demands and challenges of everyday life (WHO, 1999).

Therefore, the present research studies sensitisation of the B.Ed. student-teachers towards the

methodologies of Direct Teaching of Thinking (DTT) programme.

Methodology

The current research study was taken up as a part of major study involving development and effective implementation of DTT programme based on the CoRT1 module of Edward de Bono. CoRT1 as cited encompasses the 'Breadth' of thinking, which can help broaden ones perception. Also, the 'width' of thinking is considered to be as fundamental as 'vocabulary' is to reading. The B.Ed. programme aims towards acquisition of many professional skills by the student-teachers while, completing the coursework (Helaiya S., 2010). Hence, the sensitisation towards the methodologies of the thinking programme was done at the introductory level of the teacher education programme.

Objectives

- To sensitise the student-teachers towards methodologies of Direct Teaching of Thinking (DTT) programme.
- To analyse experiences of the student teachers after implementation of DTT programme based on CoRT.

Explanation of Terms

Sensitisation: It indicates a condition of responding to a certain stimulus in a sensitive manner. In this study, the purpose of implementing the programme for the student-teachers was to demonstrate the methodologies of facilitation process within the thinking programmeme. Also, the student-teachers would respond in varied ways through their practice.

B.Ed. Student-teachers: The population under consideration was the student-teachers who have enrolled and are undergoing B.Ed. course through teacher education. The sample included 26 student-teachers of the first year B.Ed. programme.

Direct Teaching of Thinking Programme: The thinking tools available through the CoRT1 programme of Edward de Bono were contextually used for the student-teachers' training programme.

Research Design

The major study was conducted using 'Mixed Methods' Research. The Mixed Methods research can be defined as research in which the investigator collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or a programmeme of inquiry (Tashakkori and Creswell, 2007). This paper discusses the qualitative data collected from the student-teachers and uses it to enhance the findings of the accompanying quantitative study.

The purposive sampling (Best and Kahn, 2006) was used to select student-teachers enrolled for the

B.Ed. course at SNDT Women's University, Pune, Maharashtra.

The sensitisation through the training on thinking tools based on CoRT1 module comprising of 'breadth in thinking', was conducted for 26 student-teachers. Further, five volunteer student-teachers participated in facilitation of the Direct Teaching of Thinking (DTT) programme with 8th standard students. The reflective reports of the student-teachers, subjective content test on the understanding of the CoRT, thinking programme, and field observations of these student teachers during the participation of this programme at the school level were the qualitative data strands analysed for the current study.

Findings and Data Analysis

Content Understanding

The 26 student-teachers subjectively reported on the understanding of the breadth of the thinking and importance of CoRT thinking tools for a teacher. The comprehension level about the usefulness of the tools was found to be of varied degree in accordance with individual communication skills and experiences. The subjective inputs were screened for similarities within the responses. The student-teachers regarded these tools to be a means of "better communication" with their students. Specifically, tools like "AGO (Aims, Goals and Objectives) and Planning" were accounted to be of most utility value for a teacher during classroom transactions. Further, the tools such as, "OPV (Other People's Views) and CAF (Consider All Factors), were considered to take learners' perspective". These inputs of the student-teachers were analysed and can be summed up to enhance the following skills/competencies through the use of the tools:

- To be improving the higher order thinking capacity.
- Aid to bring in clarity in decisions.
- Support to improve interpersonal relationship between teachers and students.
- Impart or improve problem-solving tools.

Highlights of the Reflections

The five student-teachers who volunteered to be part of the facilitation team for the 'Direct Teaching of Thinking' programme for the eight grade students noted their reflections. These data strands were qualitatively analysed for the minute changes reported within the behavioral manifestations of the individual thinking. The reflections indicated perspective of the student-teachers towards the thinking programme. They could bring out the differences within the 'instructional classroom transactions' and 'facilitative approach' of learning.

The student-teachers noted unique responses given by the students, such as a commonly reported one, stating, "an individual student had considered the presence

of blind students while using the thinking tool of PMI (Plus, Minus, Interesting)". These post session reflections also brought out a strong support in favor of 'focused discussions' as a strategy to be used in classroom transaction for effective methodologies. Two of the student-teachers reported enhancement of their students' 'analytical abilities' during the thinking programme. All the five student-teachers reported that, "the 'DTT programme' is more engaging and allowed strengthening of the creativity and logical thinking of their students". Further, the student-teachers reported inculcation of "independent thinking ability" within their students which, could subsequently allow the "students to lead" the focused discussion sessions in the classroom. These reflective observations were indicators of systematic development of observation skills amongst the student-teachers.

The reflections also highlighted the changes reported by these student-teachers within their own thinking that could be applied in their real-life situations. The repetitive, evaluative phrases used by the student-teachers, brought out a few more themes summed up as under:

- Self-confidence
- Goal setting
- Organised thinking
- Improved independent thinking ability
- Evaluative perspective
- Creative approach
- Preparedness towards problem solving
- Student-centric methodologies

The student-teachers revealed to have improved "self-confidence" during the programme and have "better communication" with their students during the classroom transactions showing improved 'interpersonal relationships'. Most of them expressed to "gain clarity in thinking" and "setting own goals". One of them also expressed to acquire improved "preparedness for problem-solving" in real-life situations. While, other student-teacher stated, "to gain confidence to overcome challenges through organised planning". These five student-teachers also, claimed to use these thinking tools to "strengthen their teaching skills" by building better "student-teacher relationship" and "understanding their students' point of view".

Field Observations

The student-teachers were observed through the thinking programme and the changes were noted with respect to self-exploration, understanding of the thinking skills and implications in the professional planning during the practice teaching sessions of B.Ed. coursework. The volunteer student-teachers showed a better understanding of the thinking tools and identified its significance with much clarity. Though the application of these tools in planning and implementing through their

own subject was attempted by only one of the student-teachers, each one reported to acquire clarity in understanding the finer "difference between aims and objectives" of their subject methodologies. Two of the student-teachers reported of applying an "organised approach before making a decision". The student-teachers also stated the CoRT tools of thinking to be "easy to teach", and "easy to learn".

The student-teachers actively participated in the focused discussions undertaken during the 'Direct Teaching of Thinking' at the school. They showed a varied level of confidence during the facilitation sessions. Most of them made an effort to confidently transact with their students during the workshop as well as during their internship programme subsequently, through their B.Ed. coursework. The student-teachers also exhibited enhanced critical analysis of the sessions and expressed their thoughts in post-session discussions. The student-teachers attempted to bring in changes during their lesson planning and identifying the objectives of their lessons. They also showed a creative attempt in planning of their lessons and bring in variety of classroom strategies.

Discussion

Most of teachers felt that the programme helped broaden their perspective and all of them reported the programme help them in setting own goals. Many reported that they could apply the thinking tools creatively to add meaningful experiences in their planning of methodologies. A few others felt that this programme was insightful and enabled them to consider different perspectives. The student-teachers could recognise the strengthened decision-making capacities and coping abilities with their own emotions after using the tools of thinking. Thus, the thinking process of the student-teachers indicated changes encompassing the life skills frame given by the WHO.

The qualitative analysis was primarily based on the reflections and observations of the volunteer student-teachers. Hence, the findings could not be generalised to the other subjects of the population. But the qualitative strand analysis distinctively showed improvement in 'communication' of these participants with their students, bring clarity in 'decision making' outside the specified context, preparedness in 'problem solving' and 'setting own goals' as discussed previously. The qualitative analysis also indicated that teaching of the DTT programme improved comprehension of the thinking tools to a deeper level for the volunteer student-teachers than the other participants. The facilitation of thinking programme by student-teachers, brought out other aspects of a teachers' skills like observation skills, interpersonal relationships with students, facilitative approach of teaching-learning, organisation

and planning of effective classroom transaction. The thinking programme not only helped student-teachers in effective classroom transaction, but also in improving their approach towards decision making and problem solving in daily life.

Conclusion

The research study was aimed at sensitisation of the B.Ed. student-teachers towards the DTT programme. The qualitative data instruments could bring out some common themes, which were indicative of enhanced life skills of these student-teachers. The self-reporting by student-teachers, on the improved levels of confidence, clarity to express own thoughts on evaluative views about the thinking programme and reporting on their students' point of view, shows better levels of 'self-awareness', 'critical thinking' and 'empathy'. This also brings out the process of sensitisation towards the student-centric teaching-learning focused through the Direct Teaching of Thinking. The student-teachers could acquire 'effective communication' and 'interpersonal skills.' Further their report on confronting the challenges and problems in organised manner were indicators of 'better coping skills.' A few efforts of innovative practices in transactional strategies exhibit improved creativity. Thus, the qualitative inputs within the research could bring out the degree to which, the student-teachers showed the effect of thinking programme and could eventually sustain skillfully making the day-to-day decisions.

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ENGNNOVATIONS (English-Innovations) in Primary Education to Make English Students' Favourite Subject

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Abstract

English is a language of science, aviation, research, computers, diplomacy, and tourism. It is also a language of international communication, media, internet and medical sciences. English is considered to be a window to the modern world — an official and a link language which makes a bridge to reach at almost every heart under the sun. But, unfortunately, various students, teachers and guardians consider it to be very hard, difficult, complicated, problematic, dull and monotonous subject and have a phobia in their minds. They hesitate in using this language. This article is an attempt to scan, organise and present some responsible factors behind this phobia and suggest some ENGNNOVATIONS or ENGLISH-INNOVATIONS in primary education to ameliorate English teaching and learning process, to make English students' favourite subject and to eliminate English phobia.

INTRODUCTION

Various education-committees and commissions stressed on educational ameliorations and suggested overhaul in education system. Former President of India and eminent educationist, A.P.J. Abdul Kalam, present Prime Minister of India, Narendra Modi, Swami Sivananda, Mohammad Iqbal, Marshall McLuhan, and various other educational thinkers of India and abroad suggested educational innovations in their educational philosophies (Soti, Sharma, and

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Shukla, 2010). As per their recommendations, innovations are required at every level of education and in every subject. Here, in this article, innovations regarding English subjects are discussed in detail and these English-innovations are called here as, 'ENGNNOVATIONS'. ENGNNOVATIONS is an amalgam of two words—'English' and 'innovations'. English is a language of higher studies. Maximum quality textbooks, reference books, journals and other study material can be found in English language. English is the official language of about 53 countries all over the world and spoken by more than 400 million people around the world. In this way, English is the most common second language in the world. So, it is also called 'Lingua Franca', which means most universal language. English covers both literature and language.

The word innovation is derived from the Latin word innovatus, which means "to renew or change," stemming from in – 'into' + novus – 'new'. In this way, ENGNNOVATIONS includes some innovations related with English teaching and learning, innovations to make English easier, more interesting, grasping, comprehensive and to eliminate English phobia.

Need and Importance of Engnnovation

ENGNNOVATION or innovation in English is needed for various reasons. ENGNNOVATION develops positive attitude towards English subject and provides knowledge about changed spellings and pronunciation in various countries, in a very interesting and educative way. ENGNNOVATION also informs students about different roots of English words or different etymological roots of English words. It provides opportunity to the students to practise listening, speaking, reading and writing English in the right way. It eliminates confusions regarding rules in spellings of different words and creates awareness about use of SPIRAL VOCABULARY technique. It provides proper, quick and just feed-back and feed-forward facilities to the students and removes students' problems regarding multi-meaning words and students' confusion due to many exceptions of rules in English. It provides opportunity for spoken English to students and clarity of rules and exceptions in rules of English grammar, spellings and pronunciation. It also suggests using ICT tools to overcome problem of over-crowded classrooms and problem of less opportunity for individual attention to every student. It is also helpful for removing students' problems related with pronunciation and amelioration of wrong pronunciation and for converting excessive and boring home assignment in English subject into creative, interesting and activity-based home assignments.

ENGNNOVATION is also assisting in removing problems and providing clarity regarding silent-letters in spelling of different words. It introduces new innovative methods of teaching English language and grammar. It is assisting in enriching vocabulary of students and avoiding problem and confusion related with different meanings of same words, different meaning of similar words or homophones. It is helpful in memorising English idioms, phrases, proverbs and other words and in providing suitable environment for English reading, writing, listening and speaking to the students. It pleads for providing remedial teaching to backward students and for removing students' backwardness in fundamentals of English. It develops students' interest in English subject. It is also very effective in dealing effectively with students having problems of dyslexia, dyscalculia and autism. It is helpful in developing self confidence in students and promoting praise and raise policy in teaching-learning process. ENGNNOVATION advocates CCCE, i.e., cumulative, comprehensive and continuous evaluation in English and inspires activity-based teaching-learning in English classroom. It promotes co-curricular activities and sports in English classroom. It motivates effective use of teaching-learning material aids in English, and promotes libraries and laboratories of English in schools.

Main Causes of Students' English Phobia

Main causes of students' hate for English subject or English phobia are—lack of awareness about use of SPIRAL VOCABULARY technique. Some students belonging to rural areas feel difficulty in active use of English (Soti and Sharma, 2007). Some students face the problem of lack of proper, quick and just feedback and feed forward facility. Students' problems regarding multi-meaning words, and confusion due to many exceptions of rules in English are also very significant. Students may also feel problems like lack of opportunity for spoken English, over-crowded classrooms and less opportunity for individual attention to every student (Soti and Sharma, 2006). Some students, belonging to rural areas may face problems related with proper pronunciation and amelioration of wrong pronunciation, punishment policy of some teachers or fear of students to be punished for any mistake in English or grammar (Soti and Sharma, 2008). Some students may suffer with excessive and boring home assignment in English subject, some other students may be puzzled with too many rules and too many exceptions in rules of English grammar, spellings and pronunciation. Some other causes of students' English phobia may be problems or difficulties concerning agreement of verb with its subject and helping verbs and difficulty in memorising English vocabulary,

i.e., idioms, phrases, proverbs and other words. Some students feel problem of unavailability of suitable environment for English listening, speaking, reading and writing.

Some other responsible reasons may be poor educational background of some students (Soti and Sharma, 2007), high level of teaching of teachers and students' backwardness in fundamentals of English. Some other problems are lack of activity-based teaching-learning in schools, lack of co-curricular activities and sports in English, less use of teaching-learning material aids in the subject, lack of libraries and laboratories of English in schools (Soti, Sharma and Sharma, 2007) and feeling difficulty by teachers in preparing lesson plans related with prose, poetry, translation, grammar, drama and stories.

ENGNNOVATIONS OR ENGLISH-INNOVATIONS TO MAKE ENGLISH A LOVING AND FAVOURITE SUBJECT OF STUDENTS

Here are some innovative suggestions to make students' love English subject.

First innovative step is managing SPIRAL-VOCABULARY technique in the classrooms. This technique includes introducing new words, and ensuring proper learning, memorising, using, revising these words properly, during teaching the lessons, writing questions and answers, explaining exercise, translation and general speaking (Sharma, 2006).

Another ENGNNOVATION may be conducting one word substitution competition to develop synthesising ability of students in English subject. Role play method for teaching stories and literature by assigning roles to students and allocating simple and short dialogues to them at primary level may be used as an effective ENGNNOVATION.

Another ENGNNOVATION technique is arranging English Antakshari competition to enhance students' vocabulary. In this innovative technique, students are divided into two groups. Student of first group is instructed to speak a word, for example – 'apple', students of second group is required to concentrate on the last letter of the word and speak a new word beginning with that last letter. In this example, the last letter of the word 'apple' is 'e'. Second group will speak a word starting with letter 'e', for example – 'elephant'. Now, first group is required to speak any word that begins with the last letter of 'elephant', i.e., letter 't'. This process will be continued, and students will learn lots of words in a pleasant way to enhance their vocabulary.

Another ENGNNOVATION is the use of Prompt-Ameliorating-Dictation Technique, which includes and suggests quick feedback after each word are dictated to the students about the spelling by writing correct spelling on the chalk board by the teacher. Students are required to check spelling and ameliorate (if any mistake), and similar words should be dictated after feedback.

Another ENGNNOVATION is use of action-recognition game. In this game, teacher or monitor will perform an action and other students are required to guess or recognise the action and tell quickly. It will develop learning and insight about various action verbs in the students of primary level. Main examples of action-verbs, used for this game are — eating, drinking, dancing, singing, writing, reading, jumping, sitting, standing, running, cooking, sleeping, weeping, laughing, washing and walking, etc.

Another ENGNNOVATION is pronunciation competition. In this technique students are provided a list of difficult words with silent letters, long spellings and typical pronunciations. Example of these words are—knowledge, knife, knight, could, would, often, psychology, lamb, muscle, stomach, miscellaneous, benign, design, sign, bomb, debt, thumb, womb, solemn, autumn, whistle, listen, climb, lamb, tomb, science, scare and scorn. Wednesday, foreign, align, drought, thought, through, plough, enough, cough, rough, tough, might, daughter, hour, honour, exhibition, knee, know, knot, knit, calf, column, condemn, pneumonia, receipt, card, work, pour, scissors, ascend, fascinate, evening, interesting, vegetable, fight, flight, thigh, sigh, high, taught, brought, bought, weigh and weight, etc., are some other words for this technique.

One of the most significant ENGNNOVATIONS is proper arrangement of co-curricular activities in English. Various education-commissions, education-committees, Indian Education Policy 1986, A.P.J. Abdul Kalam, Marshall McLuhan and various other thinkers of India and abroad, National Curriculum Framework, 2005, and National Curriculum Framework for Teachers' Education, 2009 also paid due importance to the co-curricular activities (Soti and Sharma, 2009). These activities assist in developing various virtues in the students such as—co-operation, co-ordination, leadership, team spirit, and brotherhood, etc. (Soti and Sharma, 2008). Co-curricular activities are the activities designed for all round development (cognitive, affective and psychomotor development).

Another ENGNNOVATION is spell out competition. In this technique, teacher speaks some words and students are required to spell out these words accurately. These words may be started from easy to difficult. Words may be selected from text-book, reference book or from other sources but must be as per level of students. These words may include words including silent words, with difficult spellings and long spellings.

Another ENGNNOVATION is applying same question and different answer technique. In this technique, teacher asks one question and all the students are required to answer differently, as per their own standpoints, preferences, family background, likings and hobbies, etc.

Next ENGNNOVATION is playing K.B.C. (*KON BANEGA CHAMPION*) game with students. In this game, various questions regarding English vocabulary, grammatical rules, prose and poetry, etc., are asked from the students and other students of class listen carefully and also assist the player as per rules decided. Students may learn lots of useful grammatical rules, spellings, synonyms, antonyms and idioms and phrases in very interesting way, with this technique.

Another ENGNNOVATION is organising more words — more marks game. In this game, students are required to write maximum words they know, starting with giving letters. Student, who writes maximum words gets maximum marks and becomes winner of the game.

Next ENGNNOVATION is conducting rhyming words competition. In this competition, students are required to write rhyming words as much as possible. Students may also be motivated and guided for metrification or versification by using these rhyming words. Self-made poem competition may also be organised to develop students' poetic talent in English.

Another ENGNNOVATION is conducting quick and appropriate use of dictionary competition. Main aim of this competition or activity is to guide the students how to use dictionary and develop habit to use it. In this competition, students are provided some words and they are required to search them in the dictionary and tell the meaning of those words, one by one with the page number of the dictionary.

As far as ENGNNOVATION in poetry is concerned, teacher may use English poem recitation competition. This English poem recitation competition is targeted on improving and developing skills of correct pronunciation, intonation, rhythm and rhyme in poem recitation.

Another ENGNNOVATION is rational grouping of students (backward in English subject with regular, punctual and brilliant students). This is very useful and effective technique to bring educationally backward students into the main stream. Educationally backward students learn a lot in the company of regular, punctual and brilliant students. Their school attendance is also improved and achievement level also ameliorated.

Next ENGNNOVATION is organising 'Super Mom' contest in the school. In this contest, a prize on monthly basis is be given to the mothers, who use to send their children regularly and neatly and assist in English home assignments of the students.

Another ENGNNOVATION is showing educational short films, cartoon films, educational slides to the students, on laptop, tablet, smart phone or computer related with English subject.

Another ENGNNOVATION is pooling of words technique. In this technique students are instructed to tell more and more words on a letter of English alphabet. They will tell more and more words, one by one and teacher will note down on the board and in

the last, students will be instructed to note down these words on their note books and learn them.

Next ENGNNOVATION is organising puppet show and magic show. In this technique, interesting and touching puppet show and magical tricks are shown to students, based on English lessons. Students are very much interested in puppet shows, magic shows and other such shows and activities. Teacher can use students' this interest for educational purposes. Teacher may explain educative concepts, new words, new content and other study material with the help of puppet shows.

Another ENGNNOVATION is use of educational mobile apps. In this age of ICT, teachers have opportunity to use various educational apps to assist students' learning. Teachers must have proper knowledge of the latest technology and various such apps. Main mobile apps which may be helpful in this regards are—Read along, Kine Master, Twincraft, Reading Assistant, Pocket book reader, Puzzle kids, ABC kids tracing and Phonics, Droplets, Language learning, Phonics: reading game, Spelling master for kids spelling learning, Unacademy learning, BYJU'S, DIKSHA, Wikipedia, Maths tricks Vedantu, Live learning, Digital teacher convas, Extra marks learnig, E-pathshala, google classroom, in Math, Hello English, Vocabulary builder, Improve English Speaking, SWAYAM, Todo Math, Maths formulas, Seesaw class, Study Smarter, Science Journal, Anatomy Learning—3D Anatomy Atlas, Edmodo, Kids Academy, Namaste English, Internshala, Pre-school Adventures and English Speaking Practice, etc.

Some other ENGNNOVATIONS are—motivating students to sign on the attractive and colourful attendance register in English. The most active and laborious student may be provided 'star of the month award' for outstanding performance in English subject. Arranging chain-based teaching learning programmes in English subject. Assigning less, simple, interesting and activity-based home assignment as per calibre and interest of students in English subject. Encourage other activities of students' interest, such as—students' news-paper, display of pictures or painting prepared by students on display board of school and issuing school magazine containing students' articles, metrifications or poems, puzzles and other materials in English.

Organising meetings with other English experts or teachers of academic repute, to discuss on various educational and practical issues and to observe their methodology of handling and managing different events of English is another way to improve English environment in the school. Exposure visits of teachers and students to other model English schools and other places such as factories, parks, press. etc, may also be beneficial for the same. Happiness quotient, spiritual quotients along with intelligence quotient and

educational quotient must also be pondered well in designing of curriculum of English subject.

From the above cited description, it is clear that proper knowledge and active use of English is very important for students, and it is believed that above cited set of remedial treatments and suggestions to ameliorate English teaching and to eliminate English phobia, will be proven as a treasure, worthy to be possessed, studied deeply and implemented.

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Functional Aspects of Verbs in Scientific Writing

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Abstract

The study highlights the semantic variations of verbs used in scientific writing. Although, there is no rigid rule in grammar regarding the use of semantically varying verbs in written technical communication; however, the behavioural pattern of verbs, with their effective usage, may add to the purpose for which they have been used. A particular verb, if used in another similar context, may distort the exact meaning. An array of examples has been drawn to drive home the fact. Further, it has also been taken into consideration the use of infinitive, gerund, prefixes and dental prefixes as necessary accompaniments of verbs used in science. One of the cardinal features of scientific writing is the exhaustive use of phrasal verbs. Use of verbs with prepositions added to them acquires new meaning and expands and enriches the frontiers of technical writing. The user however, needs to develop familiarity with such usages which are often used in scientific and technical writing.

INTRODUCTION

It is universally accepted that a sentence cannot be conceived in the absence of a verb. It is the verb that gives dynamism and immediacy of speech to the sentence. Think of a sentence as a machine, and the verb as the engine that makes the machine work. Use of an appropriate verb in a sentence gives effectiveness in writing. It has been accurately pointed out by George Bernard Shaw that "effectiveness of assertion is the alpha and omega of a style" (Shaw, 1903), and quite justly the verbs justify the end product of any sentence in terms of establishing the right meaning. In the language of science, verbs are integral to the sentences as the verbs suggest action and all scientific writings are action oriented in specific terms. In literature, the

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use of verbs has some flexibility, but in scientific writing a particular verb is rooted in specificity.

Frequency indicates usefulness and usefulness is the main criterion for teaching. Verbs frequently used in scientific and/or technical writing show a wider and a more even distribution of usage. It also shows usage-habits of the scientists in so far as they represent features which figure prominently in scientific literature. As it has been said that verbs, "alone are certain good," (Yeats, 1961) the use of verbs while denoting action holds significance in the deliberation of science and technology. The present study is an attempt to study the various forms in which verbs are used in scientific writing. Since write-up in science demands precision, accuracy and balance in a sentence, sagacity and wisdom in the choice of verbs demands well directed exploration.

Narration of Verbs

An awareness of the relative frequency of occurrence would be of immense practical importance for the designers of teaching materials to stress the specific teaching point. For the sake of precision, it is desirable to classify these verbs as follows—

(i) Verbs that overlap and thus obscure the meaning
(ii) Verbs with '— ing' endings
(iii) Phrasal verbs
(iv) Verbs with dental suffix
(v) Helping verbs
(vi) Infinitive

Verbs that Overlap and Thus Obscure the Meaning

(i) Contain, consist, comprise, constitute, form, include.
(ii) Reduce, prevent, avoid, obviate, eliminate.
(iii) Move, travel, slide, run.
(iv) Employ, exploit, utilise, use.
(v) Adopt, employ, install, introduce.
(vi) Achieve, obtain, effect, accomplice.
(vii) Force, drive, impel, push, exert.
(viii) Conduct, communicate, transmit, broadcast
(ix) Approach, tackle, solve, deal.
(x) Arrange, dispose, order, plan, organise, design, set.
(xi) Determine, decide, govern, fix.
(xii) Agree, accord, conform, comply.
(xiii) Adjust, modify, transform, adapt.
(xiv) Estimate, gauge, judge, deduce, etc. (Fowler, 1965)

Close analysis of scientific and technical literature will show more such sets of verbs. They are used to express the specialised meanings or different shades, and thus function as signals helping the readers or listeners to a proper appreciation of statements made in their intimate contexts.

In (i) 'contain', 'consist', 'comprise', 'constitute', 'form', 'include', etc., have dispositions to behave in certain ways. The flask 'contains' a very small amount of water. The atom 'comprises' of a nucleus and electrons moving round it in space. The compound strip 'consists' of two strips riveted together, one of iron and the other of copper. A number of

gases 'form' the atmosphere. Twenty students 'constitute' the practical class. Metals which we use widely in industry 'include' aluminium and steel. From the above examples, it is clear that each one of these verbs has specialised meaning or function, and unless one knows how to differentiate between them, it will be difficult to put across one's ideas correctly. In scientific and technical concepts, they almost hold the key-points, without which the technical activities or processes will hardly get expressed in suitable and clear terms.

In ii and iii, the verbs though quite different in meaning and sometimes used in the same sentence convey ideas with different variables. These variables are indicators of results that follow due to certain endeavours as in the following sentences:

Example for ii—

By taking precautions in the factory, we can—

reduce, prevent, avoid, obviate, eliminate the danger of accident

Example for iii—

The piston:

moves, travels, slides, runs forward

Note: The travel of the piston is the distance it travels

Example for iv—

The properties of uranium are—

used, utilised, employed in nuclear reactions

The verb 'exploit' listed in iv, does not fit in this scheme because it conveys a different meaning altogether, and if used in the above sentence, it will look only absurd. "The country failed to exploit the natural resources." Here it is obvious that 'utilise', 'employ', and 'use' cannot replace 'exploit' in the sentence without distorting the meaning. The verbs used under v may be put at one place as in other substitution tables shown above to form meaningful sentences:

New methods of the production were—

adopted, employed, installed, introduced a few years ago

In the same manner the other sets of verbs listed in the next section may be used, but put in different contexts in order to express the different shades of meaning. These verbs may pose certain difficulties. They may be regarded as danger signals. They may even blur the sharp outlines, if not used with a discriminating mind.

Verbs with '—ing' Endings

The suffix '—ing' is used in a variety of meanings according to the contexts in which they occur. An oil pump delivers oil to the bearings, the oil then 'draining' into a sump. The starter motor is switched off, the engine, 'accelerating' under its own power. In these two sentences, the subject of the second part is different from the subject of the first part. Again, in the following sentence: The 'proton' is the opposite of 'electron', being a particle of positive electricity, 'being' has been used in place of 'since' and the subject of the second part is often the same as the subject of the first part.

"The compressor may not be able to maintain the delivery pressure, thus causing a reversal of flow." In this sentence 'causing' shows the result of the consequence of the first statement, and here, too, the subject of the second part is normally the same as the subject of the first part, and therefore, it is not expressed. Scientists are extremely fond of using the final '—ing' clause with a view to exercising economy or precision, and focussing the principal acts or processes in the whole operation.

Working procedures are commonly described in writing of scientific prose by unattached participles. For example,

(a) Multiplying the results we obtain the Fahrenheit temperature.
(b) Neglecting all radiation losses calculate the amount of steam required.
(c) Using these values of temperature, the value can be found.

In such sentences, where there is clear break between the participle and the rest of the sentence, the participle group forms what is known as a free-adjunct. In scientific writing and elsewhere the present participle in a free adjunct is preceded by a conjunction in the following manner:

"While experimenting with cathode rays, Roentgen found, that photographic plates had become spoiled."

Phrasal Verbs

Scientists have no fascination for phrasal verbs because most of the formal verbs used by them include adverbial idea. For example—

(a) The magnetic field appears to go round and round.
(b) These windings on the generator made up for the flux distinctions in the main field.
(c) The control rods are taken out of the reactor core by remote control.

In the above sentences, the phrasal verbs can be replaced by formal verbs such as 'rotate,' 'compensate' and 'removed' without any distortion of meaning. It is obvious that the writers of scientific literature employ formal verbs for the sake of precision and dignity. In fact, these formal verbs are an essential part of the jargon of science. However, some phrasal verbs used in science cannot be easily replaced by formal verbs as in the following examples:

(a) A film of oil is put between the metal surfaces, so that they do not bear on each other.
(b) The two ends of the tunnel link up in the middle.
(c) The supply of the motor is suddenly cut off.

It is extremely difficult to replace the phrasal verbs in the above sentences by formal verbs.

Verbs with Dental Suffix

If clause has been shortened, it is significant to note that the constructions of sentence with when, while, once and if are followed by an '—ed' (dental suffix) form of the verb. For example,

(a) When emitted, neutrons travel at a high velocity.
(b) However, if slowed down to thermal speeds, their probability of capture is greatly increased.

In technical English, cause words such as because, since, as, etc., are employed for explaining manners, etc. The writers are anxious to communicate their verifiable truths through very concise forms, and these constructions readily do the same. Again, the construction of the passive relative is very common in technical writing.

a) The petrol mixes with a steam of air blown over it.
b) There is a throttle valve operated by the accelerator.

"In order that this heat energy should not be wasted the steam is condensed and passed back to the boiler. The condensate is usually reheated, so that it may be circulated back to the boiler." Infinitive of result, though used only a few verbs like form, produce, etc., is employed to indicate the result of action previously stated as in the subsequent constructions:

(a) The sand and gravel are combined chemically to make a satisfactory aggregate.
(b) Hydrogen and oxygen are combined chemically to form the molecule H_2O.

Helping Verbs

Verbs like will, can, may, should, etc., have very special functions to perform in scientific writing. 'Will' shows simple futurity and 'is going to' is not used for this purpose. "Production of the new machine will commence next year." Here 'will' stands for simple futurity. 'Will' also shows capability like 'can'. "These planes can or will fly at 800 miles per hour." In another context, 'will' may show what always happens.

"This metal will resist temperature. Good lubrication will reduce the friction." Now it will be clear from the above examples that 'will' in these two sentences cannot be replaced by any other verb to express the same idea. What happens sometimes may be indicated by 'may' and 'can', and here the boundary layers give way and conjoin the two and make them serve the same purpose.

'Should' is an important auxiliary used in technical writing and while issuing important instructions to the operators, technicians and laboratory assistants, this auxiliary is employed with great facility. The same structure is enlarged by 'so' or 'thus' as in the following:

"The houses are made of wood. Houses so constructed are much cheaper to build." Here 'so constructed' refer back to the information given just before. As past participle is usual construction in scientific writing as in the following sentences:

"Natural uranium, as used in the refining plants, is a solid." "The uranium, as used in the reactor, is in the form of the thin rod." "The bridge, as originally planned, would have been expensive." Past participles of transitive verbs used as free adjuncts, though not

very common, used in scientific writing as in the following example:

"A second jet is provided, fed from a well open to the atmosphere and supplied with petrol from the float Chamber."

Needless to say, that the stem plus dental suffix used as past tense or past or perfect participle needs an attempt at classification by establishing boundaries between the adjunct areas. Zandvoort subtly points out: "When the idea of action predominates, the group to be past participle form the category of the passive voice" (Zandvoort, 1975) and "a verbal group consisting of one of the forms of to be plus the past participle of a transitive verb may denote an action undergone by the subject of the sentence. The construction is known as the passive voice." The language of science is full of these passive constructions with past or perfect participles and they vividly describe the scientific operation or processes (Singh, 1988).

Infinitive

The idea of function is common in science. It is more or less similar to the idea of purpose but the idea of function emphasises the use rather than purpose. "The function of super heater is to raise the temperature of the steam. The super heater serves to control the speed of the engine." In both these sentences it is the use rather than function that is being emphasised. The idea of purpose is, however, emphasised by in order 'so as, etc.' as in the following examples:

"A flux should be applied to the heated metal to prevent oxidation."

'Should' is also used to denote specification when it is required that:

(a) The steel should not contain more carbon.

(b) The diameter should not exceed one fourth of an inch.

Again, what is expected to happen is also indicated by the use of 'should' as in the following construction: "The process of cooling should continue for hours."

With the discussions above it becomes amply clear that the functional aspects of verb are very essential in scientific literature. The authors and teachers of scientific manuals, books, research papers and reports ought to be very mindful about their choice of verbs and so should the students emulate during their training. Their approach should neither be casual nor cavalier but trained and discriminatory in the choice of verbs. The dynamism of verbs as discussed above can go a long way in making a scientific writing precise and effective. Ambiguity is a bane in the domain of science which can be avoided with a trained choice of verbs. Discrimination and discretion in handling verbs that overlap and can potentially obscure the meaning, verbs with '—ing' endings, phrasal verbs, verbs with dental suffix, helping verbs and infinitive is advocated and recommended.

Conclusion

The different behavioural patterns or verbs as analysed in the preceding paragraphs show that the English of the sciences is an important part of the context of modern English. One of the characteristics of modern English is to give an idea as exactly as possible with the help of such choice and disposition or words as will achieve this economically. The language of science represented as a phenomenon preceded by activity is exactly trying to communicate the same by subscribing to the view of Confucius (551–479 BCE) that – if what is said is not what is meant, then what ought to be done remains undone.

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A Comparative Study of Proficiency in English Language of Male and Female Secondary School Students

A. Kumar* and Monika Negi**

Abstract

English was only a library language in the past but it is now viewed as the language of opportunity of acquiring jobs, quest for global identity, and thus prompts efforts of all state government to make the language accessible to all. This has become an important language in our country and is widely used in media, personal life, courts of law and administration. Therefore, it is necessary that students are taught English in proper ways so that they can gain command over it. In spite of immense importance and globalised acceptance of necessity of knowledge of English Language, the average Indian student is not able to either learn English or communicate in English with a reasonable level of proficiency in has become significant. The purpose of this study is to analyse the English Language Proficiency of the male and female students studying at secondary level. The sample consisted of 154 students studying at the secondary level. The tool used for data collection was English Language Proficiency Test developed by K.S. Mishra and Ruchi Dubey. The result of the study revealed that there is no significant difference between the English Language Proficiency of the male and female students studying at the secondary level.

Introduction

In the present era, English is considered as a global language through which people all over the world communicate with each other. It is a link language which is used to get knowledge

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in different fields at national and international level. The language barrier is considered as a challenge for the students, especially in establishing themselves and achieving academic goals. Numerous aspects might be considered enabling a student to achieve academic success. English Language Proficiency (ELP) is not an important factor in determining the academic proficiency of students doing undergraduate courses, but also gives them the opportunity to pursue higher education (Kalivadan et al., 2015). The importance of the English proficiency in curriculum cannot be underestimated. It has been found that ELP and academic achievement have a positive relationship between these two variables (Shahragard et al., 2011).

ELP is an important factor in determining the academic performance. The fashion of English has resulted in the growth in English medium schools and colleges. The students studying in English medium school have better promises and visions in the global market. English has gained number of opportunities for Indian students at their homelands as well as in other countries too. A positive attitude towards English as a communication means is essential for the academic performance. English language learning among students is being affected by so many psychological and sociological factors like mental health, intelligence, personality of the child, home environment, school environment, etc.

English proficiency is the demonstrated ability to speak, write, read and comprehend English to a standard set by the institution. According to Blagojevich, Ruiz and Dunn (2004), "English language proficiency: English language learners' communication information, ideas and concepts necessary for academic success in the content area of social studies." Limited English proficient student is defined as a student whose first language is a language other than English, who is unable to perform ordinary classroom works in English (Driscoll, 2003). In India, English has become the most important factor in an individual's life to get quality in education as well as an opportunity to participate in the national and international life. Shukla H. (2004) finds that lack of proper guidance, lack of exposure to formal environment, family background of the students, lack of educational facilities, economic and social status, lack of confidence are some of the causes for English communication problem. Dua and Sharma (2006) conducted a study on spelling errors of 200 UP board education children of Class XI and found girls made fewer errors than boys. Children belonging to an educated or less educated family committed more spelling errors than those belonging to highly educated family. But family income did not make any difference in performance. K. Karthigeyan and

K. Nirmala (2012) revealed that there exist a gradual growth rate in the academic achievement of secondary level students in English and it also observed that gender difference exists in the academic achievement in English. Girls performed better than boys in English language.

Significance of the Study

Today, English has become a global language through which people all over the world can communicate and participate at national and international life. ELP is very essential for the students to pursue higher education and get better employment opportunities in future. Therefore, an attempt has been made in this study to assess the ELP of the secondary students so that they can be successful in every sphere of life.

Objective of the Study

The objective of this study is to assess the English language proficiency of the male and female students studying at secondary level.

Hypotheses

The hypotheses formulated in this study is given below:

H01: There is no significant difference between the English proficiency of the male and female students studying at secondary level.

Methodology

Participants

For this study, 154 voluntary participants were selected from secondary school. Seventy-seven of these participants were female students, and seventy-seven of them were male students. All these participants were from twenty-two government and non-government schools of Dehradun district of Uttarakhand state.

Instruments

English Language Proficiency Test (ELPT) of secondary school students developed by K.S. Misra and Ruchi Dubey was used for data collection in the study. The test consists of 56 items. It covers fourteen areas of English language. The test is divided into three sections—A, B and C on the basis of types of items. It was administered to Class X students. Split-half reliability and Kuder-Richardson reliability coefficient of the test has been found to be .85 and .84 respectively. Face validity has been found by asking experts belonging to the field of Education and English. Concurrent validity was found to be 0.50. Scoring was done through manual scoring; a score of 1 was given for every correct response, and 0 for the wrong response.

Research Design

The non-experimental research design having correlational research model is used in this study. The investigator used descriptive cum survey method for data collection.

Research Procedure

The tool was administered in accordance with the instructions laid down in the manual of ELPT.

Before distributing the ELPT, instructions given in the tool were explained in a specified manner to the students. Investigator distributed the questionnaire among the secondary students studying in government and non-government schools. Investigator instructed the students the way to give the answer for the questionnaire. The time limit for ELPT was 30 minutes.

Statistical Analysis

The statistical analysis has been done with the help of Microsoft excel 2010. A t-test was applied to measure the significant difference between male and female students studying at the secondary level.

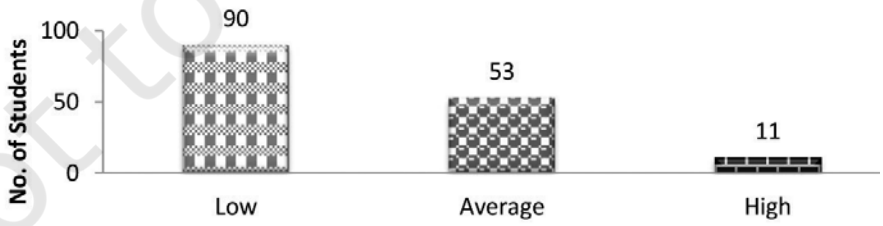
Results

This part deals with the distribution of secondary school students for the total sample (N = 154) on the basis of their proficiency in English. For this, all the secondary school students were categorised into three groups, *viz.,* low, average and high proficiency in English on the basis of their scores on ELPT. As per the guidelines laid in the manual of the tool used, the raw scores were converted into z-scores, and on the basis of the range of z-scores the students who scored 0.51 and below were termed as "Low" in proficiency, and the students who scored between 0.50 upto +1.25 were termed as "Average" in proficiency while the students scored +1.26 and above were termed as "High" in Proficiency.

Table 1
Distribution of Secondary School Students on the basis of their Proficiency in English

Level of Proficiency	No. of Students
Low	90 (58.44%)
Average	53 (34.42%)
High	11 (7.14%)
Total	154 (100%)

From the above table it has been concluded that 58.44 per cent of the students studying in secondary classes have low proficiency in English, and 34.42 per cent of the students have an average proficiency in English, and the remaining 7.14 per cent shows high proficiency in English.



Graph 1: Level of Proficiency

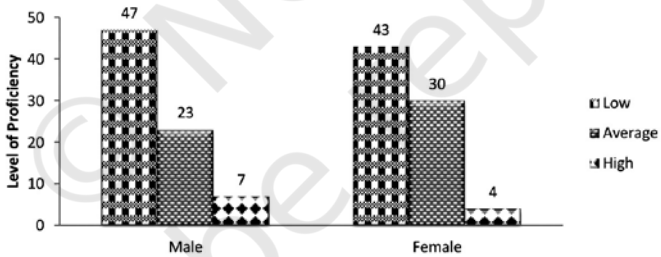
This part deals with the number and percentage of the students for the total sample (N = 154) on the basis of their level of proficiency.

Table 2
Distribution of Male and Female Secondary School Students on the basis of their Proficiency in English

Sex	Level of Proficiency			
	Low	Average	High	Total
Male	47 (30.52%)	23 (14.94%)	7 (4.55%)	77 (50%)
Female	43 (27.92%)	30 (19.48%)	4 (2.60%)	77 (50%)
G. Total	90 (58.44%)	53 (34.42%)	11 (7.14%)	154 (100%)

From Table 2 it has been concluded that 30.52 per cent of the male students studying at secondary level have low proficiency in English, and 14.94 per cent have an average proficiency while 4.55 per cent have high proficiency in English. In the same way, 27.92 per cent female students studying at secondary level have low proficiency in English, and 19.48 per cent have an average proficiency while the remaining 2.60 per cent have high proficiency in English.

This part deals with number and percentage of the students for the total sample (N = 154) on the basis of their proficiency in English. For these, two groups were formed on the basis of their gender.

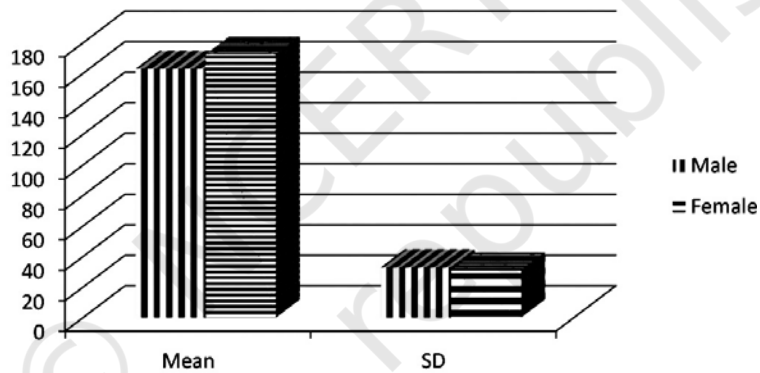


Graph 2: Male and Female students on the basis of their proficiency in English

Table 3
Comparison of Male and Female Secondary School Students on the basis of their Proficiency in English

S.No.	Sex	Proficiency in English			Level of Significance
		M	SD	t-value	
1.	Male N =77	162.97	32.90	1.28	p>0.05
2.	Female N=77	172.45	30.97		

Observation of Table 3 shows the proficiency in English of the male and female secondary school students in the form of Mean and SD. The difference between the means of the Proficiency in English of the male and female students studying at secondary level were compared using 't' test. The 't' value was found to be 1.28 which is statistically not significant at 0.05 level of significance. Therefore, it can be inferred that there is no significant difference between the English Proficiency of the male and female students studying at secondary level.



Graph 3: Proficiency in English of the Male and Female Students in the Form of Mean and SD

On the basis of above data presentation, we can conclude that there is no difference between male and female students as far as proficiency in English is concerned.

Findings

The findings of the study revealed that majority of the students studying at secondary level have low proficiency in English. Hence, efforts should be made at the school level to improve the English proficiency among the students. But no gender difference exists in English proficiency of the students studying at the secondary level.

Conclusion

It is very essential for the upcoming generation to have a good command and proficiency in English, in order to have the power to excel and progress as English becomes an international mode of communication. As per the statistical analyses and interpretation of data, we can conclude that there is no significant difference between male and female students as far as proficiency in English is concerned. If we observe the data closely, we may infer that the proficiency of females is little bit better than males. It is evident from the data that 27.92 per cent of females show low proficiency as compared to 30.52 per cent of

the males. Similarly, 19.48 per cent of the females fall under the category of average proficiency as compared to 14.94 per cent of the males. Thus, it may be inferred that female secondary students have low proficiency in English as compared to male secondary students, but their average proficiency in English language is slightly better than male secondary students. Hence, it is good to advise teachers that they should motivate their students to develop good proficiency level in English, which could enable them to communicate effectively and efficiently using international mode of communication.

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Effectiveness of Activity-based Learning Practices on Creativity of Prospective Teachers of Secondary School

Rakesh Kumar* and Moushmi Kumari**

Abstract

The paper is aimed to explore the creativity in context of fluency, flexibility and originality through activity-based practices of prospective teachers of secondary school. Previously educational institutions exist to provide instructions, but now-a-day by they exist to ensure learning with expected learning outcomes. During this advance technology dominated world learners and teachers need to learn new techniques, skills and knowledge for adapting in changing environment throughout the life. Creativity is one of the important ways to energise the brain of learners. Creativity exists in everyone, and teachers are required to brush up and bring it out from the inner core. Thus, the objective of the study is to observe the effect of learning practices of 60 prospective teachers from College of Teacher Education, Bhagalpur, Bihar, on fluency, flexibility and originality with respect to traditional teaching method. It is found from the study that there is significant difference between the development of creativity through activities related to creativity and traditional method.

Introduction

Education prepares an individual to the level of perfection by drawing out the best skills and habits for ideal citizen from them in the era of globalisation, knowledge explosions, enormous scientific growth and technological innovations. Education system has gradually changed during the past few decades where the teaching-learning process go beyond the chalk-talk in the classroom and

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contents are not confined only in the textbooks. Hand gestures and lecture of teachers also have been replaced by projectors and presentations. During this era, the teaching profession becomes more challenging. The teachers become more facilitators in the entire teaching-learning gamut. In this changing scenario, a teacher is someone who builds the fabric of the society, and students are the bricks and mortar of the future. Prospective teachers are required to equip with innovations, motivations and multitasking. Although, we always talk about technocrats and artificial intelligence, all these cannot replace the presence of a teacher. Only teachers have their own intellectual property, cognitive and creative thinking with human touch. The creative teacher can create opportunities for creativity through arranging activities like field trips, special days, pictures, dramatisations, pets and animals, and growing plants. The creative teacher provides ideas to develop, and these ideas can become the substance of the creative productions of learners (Torrance, 1965). Creativity is a powerful weapon which fits the learners in digital, changing, challenging and emerging world. Creativity is something to create from nothing and from something we wish to create everything with excellence. It is a path of reflection of new imaginative ideas into reality. Actually, creativity is the ability to excel hidden pattern and then make connection between related phenomenon and solutions of the problems (Raajan, 2018). Every learner has creative potential and this potential nourished by proper care to nurture and culture the creative activities. Learners have varieties of skills like questioning, inquiring, searching, manipulating, experimenting, expressing and playing which are to be elicited by teachers. They need time for the creative encounter.

Review of Literature

Danielle E. Kaplan (2019) revealed that creativity theories should be included in the teaching of teachers, in developing their knowledge and skills needed to shape student development, particularly creativity development. Teachers and teacher candidates create such a learning environment for creative activities where they transform imaginative ideas into realistic actions resulting in expected outcomes.

Deepty Gupta (2011) found from her study that students were highly creative on the dimension fluency and lowest creative on the dimension originality. It is found from the study that t-value of different variables — sex, area, schooling, mother and father occupation, on creativity dimension fluency, flexibility and originality do not differ significantly.

Mc Fadzean (1998), Johnston, James, Lye and McDonald (2000) found that team collaboration in problem solving enhances creativity, and allows for better outcomes than

problem solving when performed individually.

Stein (1974, 1975) summarised studies of mid 1970s, where researchers evaluated attempts to stimulate adult creativity at the individual and group level, using a range of techniques, including role play, brainstorming, psychotherapy and hypnosis.

Torrance (1973) reflected that the creative teacher is an accepting, tolerant and humanist and allow the learners to develop to their maximum. Teacher should respect the originality of learners by praising them for their initiated thinking and learning, giving them freedom to learn through creative problem solving activities.

Need and Significance of the Study

Creativity is a process of divergent thinking, where learners think in different ways with different perspectives. Majority of learners are not exposed to face the challenges which would develop their potential for creativity and innovations because the outcome of whole education system is based on classroom activities and teaching-learning process. Present examination system emphasises on 'eating and vomiting', i.e., rote learning and repeated exercises which doesn't support the creativity among learners and leads to crushingly crippled, dishonest and neurotic patient. Practices of creativity in the classroom facilitate learners to ventilate their creativity, divergent thinking and distinctive quality, encourage for critical and constructive thinking which encourage performing each and every related work creatively. These practices also develop a sense of appreciations among the learners towards the creative, innovative and new avenues available. The present education system focuses on examination system rather than the actual process of learning as well.

NEP 2020 advocates ensuring learning with excellence and applications. Teachers are criticised and blamed that they do not provide necessary environment for nurturing creativity among learners. So, the responsibility and duty of Teacher Education Institutions is increased to prepare prospective teacher armed with creativity and divergent thinking, so that they accept and solve all the challenges of life. They also transform learners capable to face and handle the challenges boldly. The importance and necessity of creativity and ever developing process in the present time has attracted the attention of researchers and educational planner toward the study and analysis of creativity from educational point of view. Thus, researchers aim to work on 'Effectiveness of activities-based learning practices on creativity of prospective teachers of secondary school' at C.T.E, Bhagalpur.

Operational Definition of Important Terms

Creativity: It is the ability to produce new and useful ideas, imagination with originality, productive and value-based and a capacity to join two or more elements to form a new unity or purposes.

Fluency: It is defined as the ability to think effortlessly to generate a quantum of ideas with responses for solutions of problems.

Flexibility: It is defined as the ability to easily abandon old ways of thinking, adopt new ones and produce ideas, responses, questions and solutions in a variety of categories. Flexibility generates verities of ideas.

Originality: It is the ability to develop ideas that are statistically unusual, novel and unique.

Prospective teacher: Teacher candidates who are enrolled in teacher education programme and spend more time in real teaching situations.

Teacher education institution: This institution prepares teachers of tomorrow who learn how to learn, think and teach. Here, prospective teachers are to be trained to face challenges and issues of teaching-learning process.

Objectives of the Study

Objectives of the study are—

- to study the development of creativity among prospective teachers through chalk-talk and visual aids (control group prospective teachers).
- to study the development of fluency among prospective teachers by using activities of creativity (experimental group prospective teachers).
- to study the development of flexibility among prospective teachers by using activities of creativity (experimental group prospective teachers).
- to study the development of originality among prospective teachers by using activities of creativity (experimental group prospective teachers).
- to study the development of creativity among the experimental and control group prospective teachers.

Null Hypotheses

Researchers formulate the following null hypotheses:

- $H0_1$—There is no significant difference between the pre-test score of control and experimental group prospective teachers.
- $H0_2$—There is no significant difference between the post-test score of fluency of experimental control group prospective teachers.
- $H0_3$—There is no significant difference between the post-test score of flexibility of experimental and control group prospective teachers.
- $H0_4$—There is no significant difference between the post-test score of originality of experimental and control group prospective teachers.

- $H0_5$—There is no significant difference between the post-test score of creativity of experimental and control group prospective teachers.

Material and Method

In the present study, the researchers manipulate the effect of independent variables that is activities of creativity and traditional method in order to observe the effect of manipulation upon the dependent variable that is fluency, flexibility and originality of prospective teachers of secondary school. So, the researchers selected pre-test, post-tests design under the true experimental methodology. Experiment was conducted in three phases. During first phase the researchers administered the achievement test on science to observe the prior experiences as a pre-test. On the basis of pre-test scores the prospective teachers were divided into two groups consisting of high achiever, average and underachiever. One group was named as control group and other as experimental group. During second phase, treatment was administered where control group prospective teachers were taught through traditional method and the experimental group prospective teachers were taught same contents by activities of creativity. For controlling the effects of teachers' quality both groups worked under supervision and guidance of researchers themselves. During third phase, the same test as a post-test in similar control condition as in pre-test was conducted on both groups.

Sample and Sampling Technique

In present study, researchers selected 60 prospective teachers of secondary school from college of teacher education, Bhagalpur, Bihar through simple random sampling technique. Researchers applied two types of tools— testing/measuring and non-testing/instructional. Testing tool was achievement test on science and instructional tools were learning plan based on traditional method and activities-based practices. These tools were standardised by verifying their reliability and validity. The learning plans were discussed with subject experts, educational technology friendly and skilled resource persons and accordingly alteration and modification had been done. Learning plans were ready for final administration. The testing instrument's reliability was verified by test-retest method of coefficient of correlation and validity was checked by experts' opinions.

Level assigned	Independent variable	Post-test
Experimental group Prospective teachers of secondary school	Taught through activity-based practices of creativity	T2E

Control group Prospective teachers of secondary school	Taught through traditional method	T2C

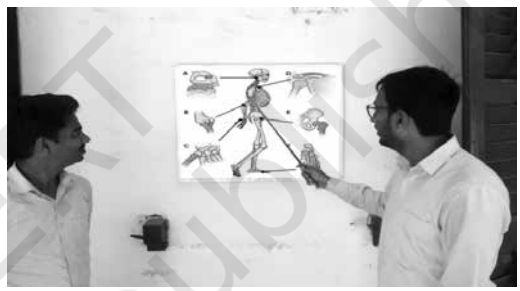
EXPERIMENTATION

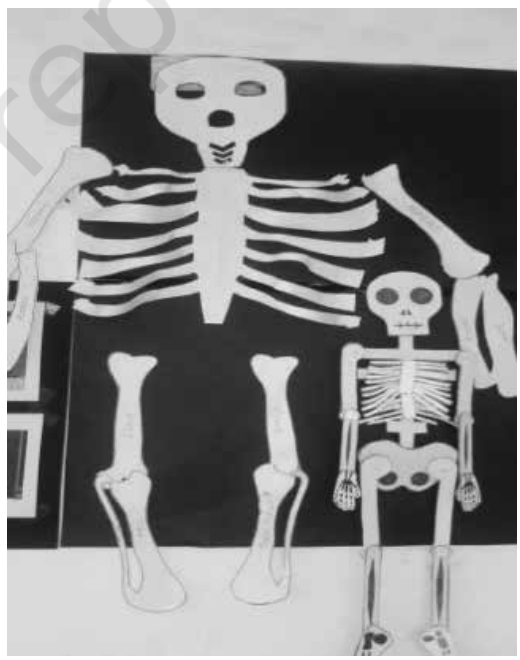
The control group was taught structure and function of skeleton system by using chalk-talk and visual aids while the treatment group was taught activities of creativity. Researchers applied preparation of 2D and 3D models and posters, run and paste competition, roleplay with conversation in Hindi or English and *NukkarNatak*. These activities involved active participation and contribution of each and every individual in groups. The total numbers of participants were 30 in experimental group, so five homogenous groups consisting six members each were formed. Each group was now engaged in performing their task in activities as mentioned below:

Activity 1

Preparing 2D and 3D models and posters

Each group was assigned a task to discuss and asked to prepare charts, posters and model of skeleton system explaining in explicit way. Researchers observed and checked the groups and helped to understand the structure and function of skeleton system. Then each group prepared 2D and 3D models by clay and brown carton box and displayed presentations before other groups. After that a healthy quiz competition was carried out in which each member of every group had to answer at least one question. This was made to avoid snubbing of shy respondents and then group who secure high marks was announced winner.





Activity 2

'Run and paste'

In this activity, each group was assigned task to run and paste bones of skeleton system on body of an individual. They are allowed to discuss and plan for 30 minutes. They prepared different bones, ribs and skull separately with combined efforts from chart paper in guidance of researchers. Now they asked to paste the different organs on body of an individual at their respective place one by one. Researchers observed and gave clues whenever they went wrong. There was healthy competition among groups and those who performed best were announced winner.

Activity 3

Roleplay

In this activity, each group was asked to play drama through role play and simulation on skeleton system. They were allowed to discuss and plan for 30 minutes. Then they performed the character of different bones, ribs, skull and joints. During the act, each bone made conversation between them to convey structure and physiology. They not only explained the body system but also the values of collaboration and unity to society. There was healthy competition among groups and those who performed well were announced winner.

Activity 4

Nukkar Natak

Each group was asked to play *Nukkad Natak* to aware common people about the values of life. There were two scenes— 'hell' and 'heaven'. Narad Muni came to hell and observed that everybody was in trouble and show them sad because no one has joint between bones and all were hungry instead of plenty of tasty food. Now he moved to heaven and found that all were very happy rather they also didn't have joints between bones. They helped each other and enjoy the life happily.

Data Collection

The same achievement test was administered on both groups for post-test. After completion of experiment, two types of scores were obtained. Both pre-test and post-test scores were used for statistical analysis of the data.

Result and Discussion

Analysis technique is the heart of any research. Here description and interpretation of the data were analysed based on the elements of creativity

Table 1
The 'T' Value for the Comparison between the Pre-Test Scores of Experimental and Control Group Prospective Teachers of Secondary School

Level compared	Number of Prospective teachers	M	SD	SEM	SED	df	Calculated value	Tabulated value	H01
Experimental group Prospective teachers	30	38.83	10.44	1.9	2.9	58	0.40	2.66	A*
Control group Prospective teachers	30	39.5	12	2.1					

*A=fail to rejectH0=Null Hypothesis

examined. These elements were fluency, flexibility and originality with values. The result showed that there was development of creativity when the above said activities were practiced by the prospective teachers at Teacher Education Institution.

The result shows that the calculated value of 't' is 0.40 at df58 at 0.05 level of confidence. This indicates that the null hypothesis fail to reject thus it means there is no significant difference between the pre-test scores of experimental and control group prospective teachers.

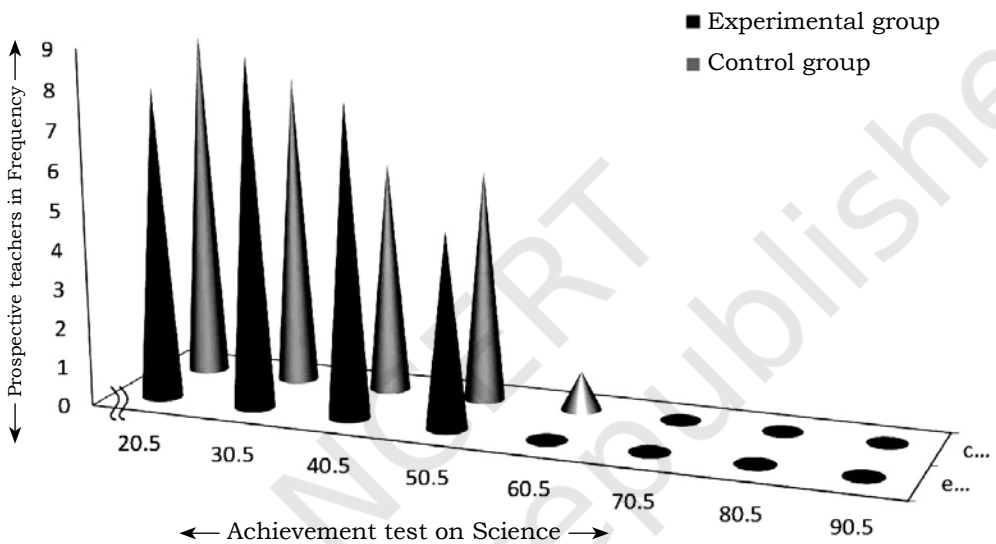


Figure1: Comparison between the pre-test scores of experimental and control group prospective teachers of secondary school.

Table 2

The 'T' Value for the Comparison Between the Post-test Scores of Fluency of Experimental and Control Group Prospective Teachers of Secondary School

Level compared	Number of prospective teachers	M	SD	SEM	SED	df	Calculated value	Tabulated value	H02
Experimental group prospective teachers	30	17	3.26	0.59	0.94	58	3.53	2.66	R*
Control group prospective teachers	30	13.66	4.02	0.73					

*R=Reject

H0=Null Hypothesis

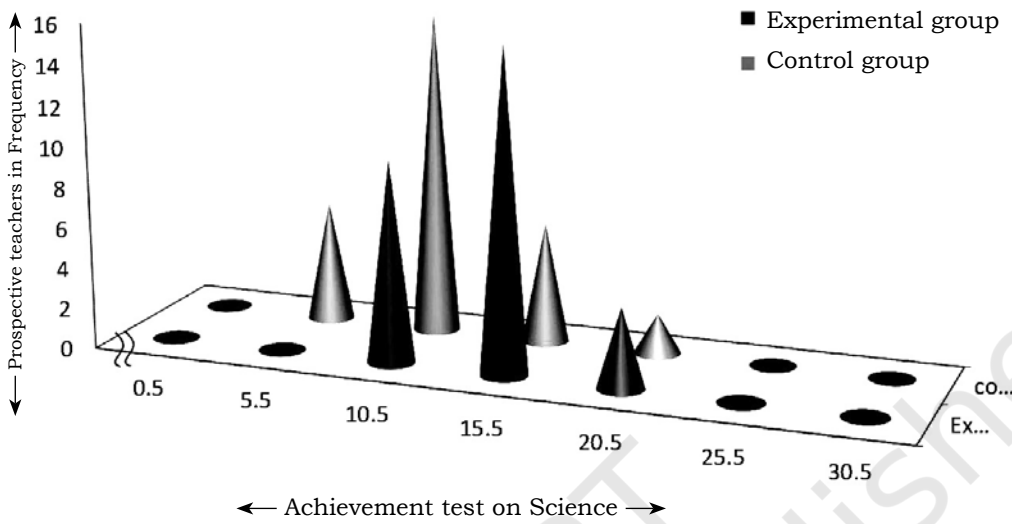


Figure 2: Comparison between the post-test scores of fluencies of experimental and control group prospective teachers of secondary school.

Table 3
The 'T' Value for the Comparison Between the Post-test Scores of Flexibility of Experimental and Control Group Prospective Teachers of Secondary School

Level compared	Number of prospective teachers	M	SD	SEM	SED	df	Calculated value	Tabulated value	H03
Experimental group prospective teachers	30	18	2.89	0.52	0.88	58	4.71	2.66	R*
Control group prospective teachers	30	13.83	3.89	0.71					

*R=Reject H0=Null Hypothesis

The result shows that the calculated value of 't' is 4.71 at df 58 at 0.05 level of confidence. This indicates that the null hypothesis is rejected which means there is significant difference between the post-test scores of flexibility of experimental and control group prospective teachers.

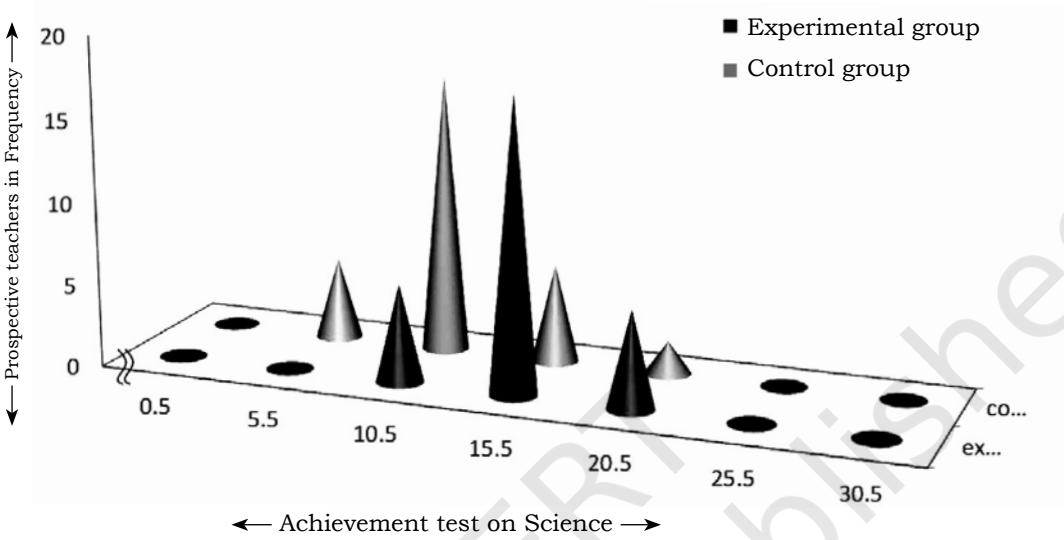


Figure 3: The 't' value for the comparison between the post-test scores of flexibility of experimental and control group prospective teachers of secondary school

Table 4
The 'T' Value For the Comparison Between the Post-test Scores of Originality of Experimental and Control Group Prospective Teachers of Secondary School

Level compared	Number of prospective teachers	M	SD	SEM	SED	df	Calculated value	Tabulated value	H04
Experimental group prospective teachers	30	17.33	3.81	0.69	0.86	58	4.24	2.66	R*
Control group prospective teachers	30	13.66	2.81	0.51					

*R=Reject H0=Null Hypothesis

The result shows that the calculated value of 't' is 4.24 at df 58 at 0.05 level of confidence. This indicates that the null hypothesis is rejected which means there is significant difference between the post-test scores originality of achievement test of experimental and control group prospective teachers.

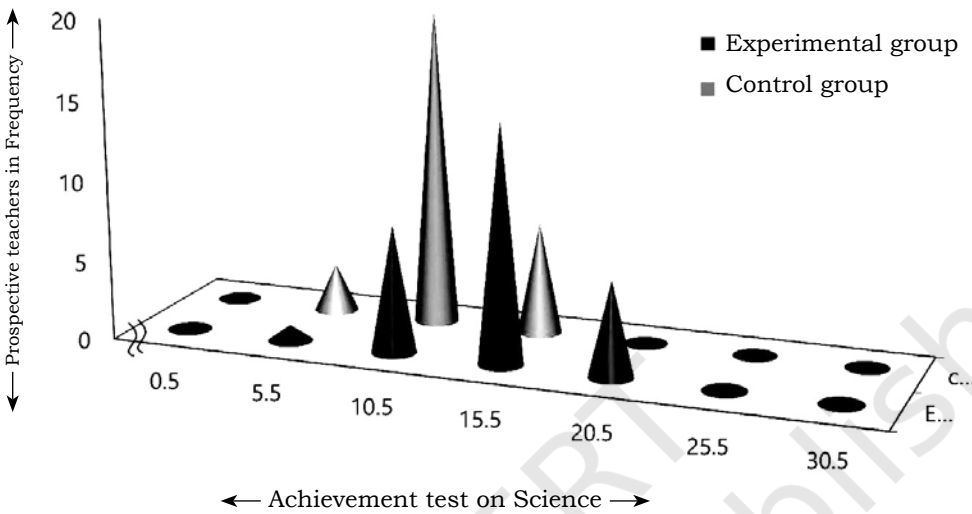


Figure 4: The 't' value for the comparison between the post-test scores of originality of experimental and control group prospective teachers of secondary school

Table 5
The 't' Value for the Comparison Between the Post-test Scores of Creativity Test of Experimental and Control Group Prospective Teachers of Secondary School

Level compared	Number of prospective teachers	M	SD	SEM	SED	df	Calculated value	Tabulated value	H05
Experimental group prospective teachers	30	52.83	11.81	2.1	2.8	58	4.08	2.66	R*
Control group prospective teachers	30	41.17	10.22	1.8					

*R=Reject H0=Null Hypothesis

The result shows that the calculated value of 't' is 4.08 at df 58 at 0.05 level of confidence. This indicates that the null hypothesis is rejected which means there is significant difference between the post-test scores of creativity of experimental group prospective teachers and control group prospective teachers.

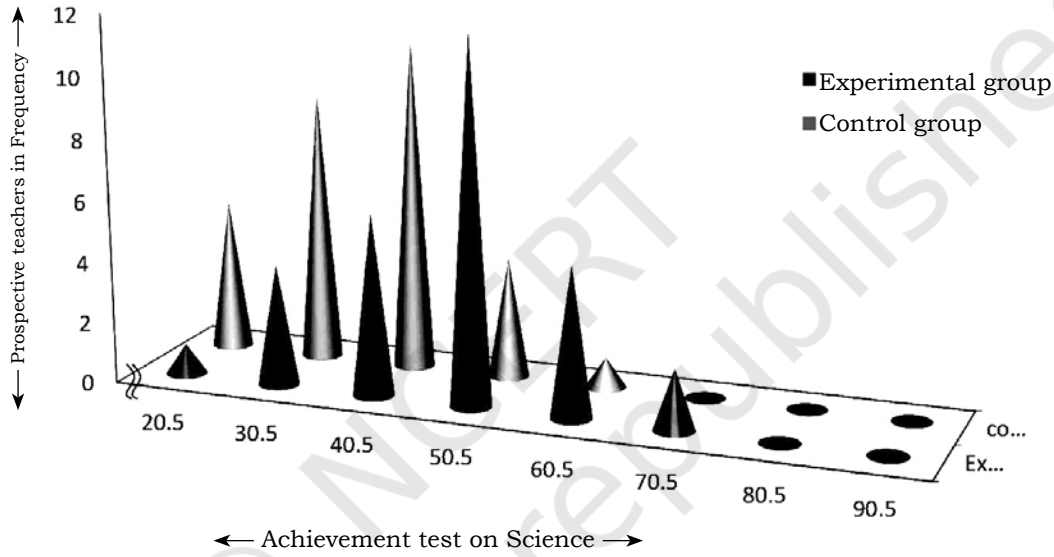


Figure 5: The 't' value for the comparison between the post-test scores of creativity of experimental and control group prospective teachers of secondary school

Major Findings of the Study

It was found from the paired ogive as shown above that both groups are heterogeneous prospective teachers of high achiever, average and underachiever which reflects the result of the effect of activities of creativity over traditional method accurately.

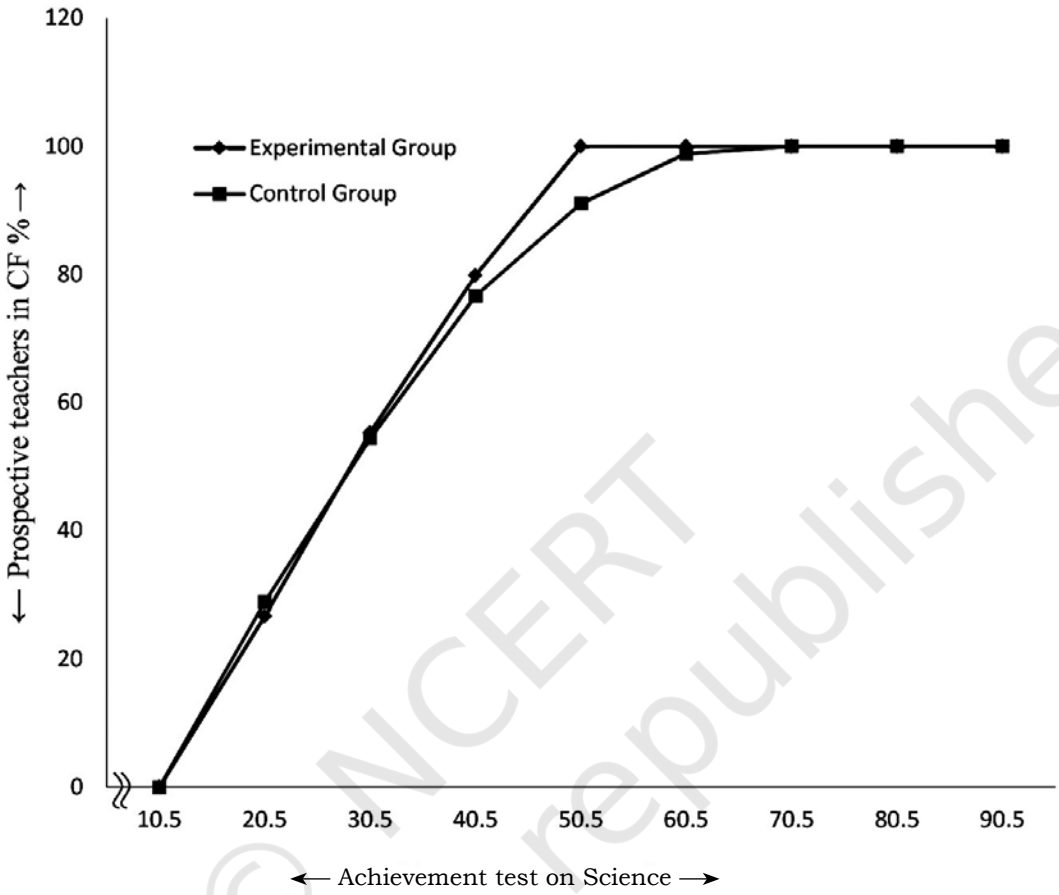


Figure 6: Comparison between the pre-test scores of experimental and control group prospective teachers of secondary school in achievement test on science

The paired ogive revealed the comparison between the post-test scores of fluency of experimental and control group prospective teachers. It was found that prospective teachers develop better fluency in ideas through activities of creativity than learning practices through traditional method.

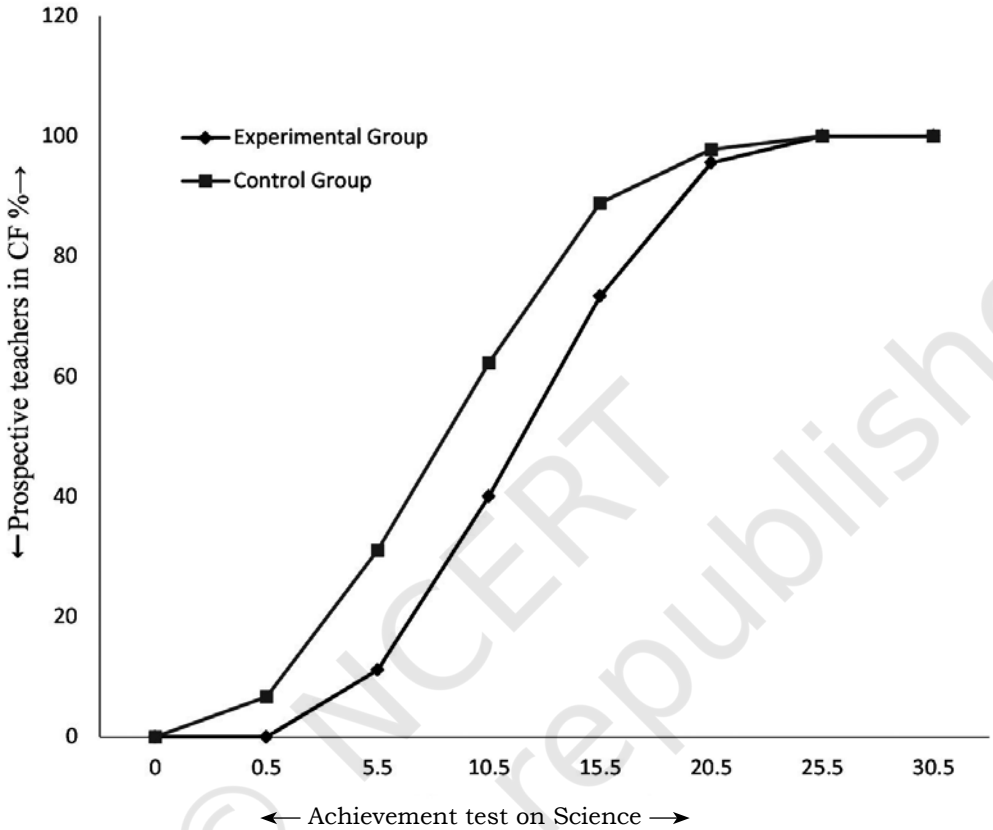


Figure 7: Comparison between the post-test scores of fluency of experimental and control group prospective teachers of secondary school in achievement test on science

The paired ogive revealed the comparison between the post-test scores of flexibility of experimental and control group prospective teachers. It was found that prospective teachers develop better flexibility in ideas through various activities of learning practices of creativity than learning practices through traditional method.

The paired ogive revealed the comparison between the post-test

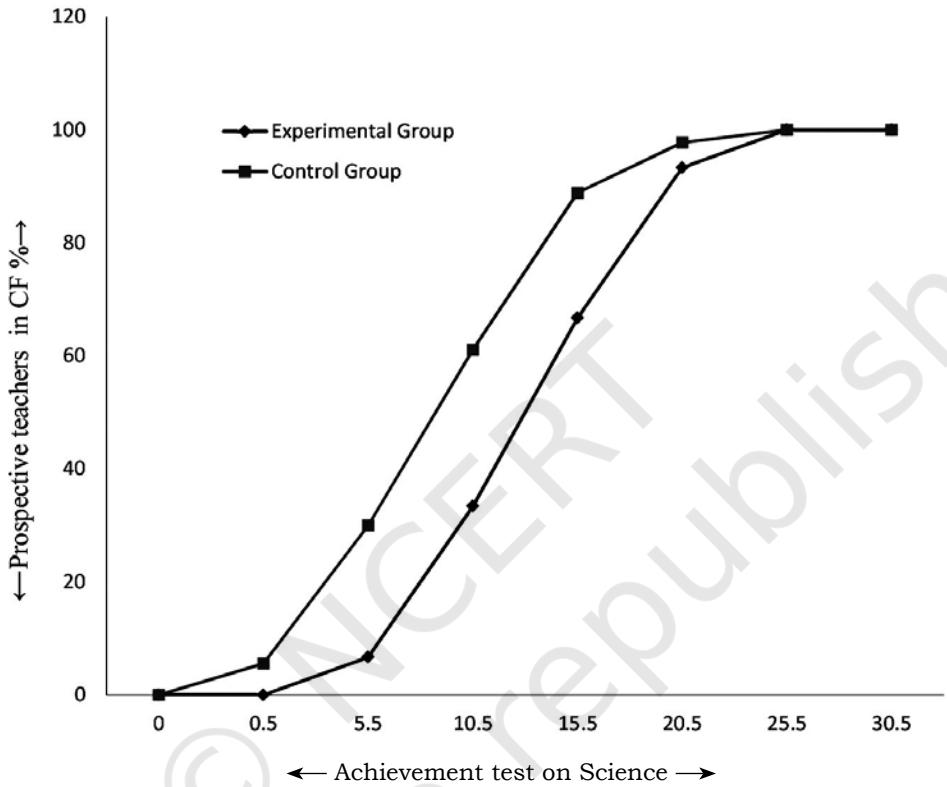


Figure 8: Comparison between the post-test scores of flexibility of experimental and control group prospective teachers of secondary school in achievement test on science

scores of originality of experimental and control group prospective teachers. It was found that prospective teachers develop better originality in thinking through various activities of learning practices of creativity than learning practices through traditional method.

The paired ogive revealed the comparison between the post-test scores of creativity of experimental group and control group prospective

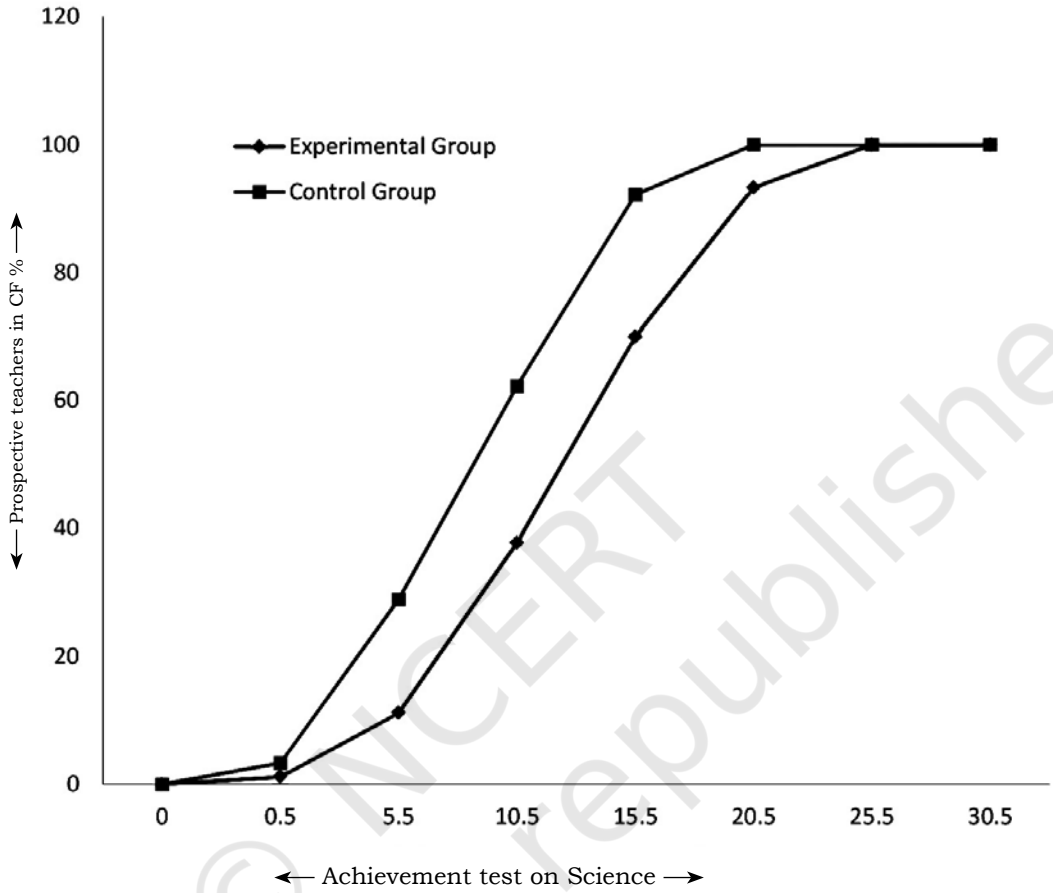


Figure 9: Comparison between the post-test scores of originality of experimental and control group prospective teachers of secondary school in achievement test on science

teachers. It is found that prospective teachers develop better creative thinking by participating in various activities of learning practices than learning practices through conventional method.

Conclusion

A creative teacher is seen as one who is consistently curious and constantly seeks out new ways to improve their abilities for transmitting knowledge. Creative thinking skill becomes the priority of the emerging era which is characterised by an explosion of knowledge and technology in all fields. Educational Institutions prepare learners to face challenges of individual and society creatively. Creativity prepares learners to

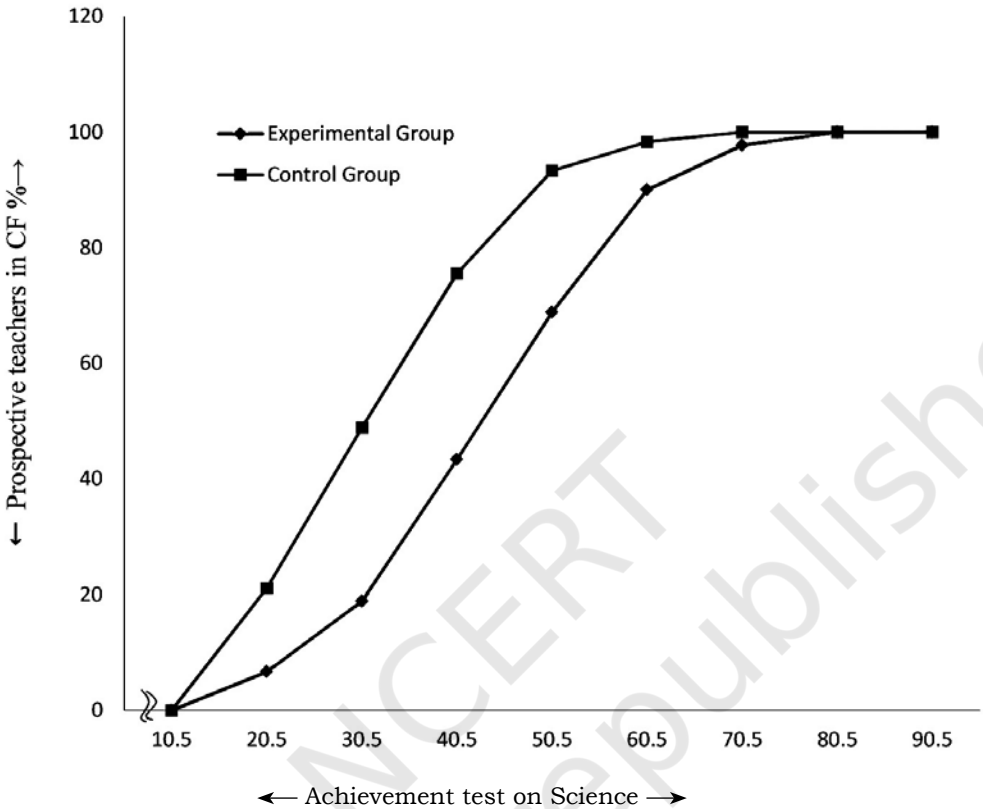


Figure 10: Comparison between the post-test scores of creativity test of experimental and control group prospective teachers of secondary school in achievement test on science

produce ideas, solutions, concepts and theories that are characterised by uniqueness and originality (Rebel 1985, Fault, 2000).

In present study, it is concluded that whenever prospective teachers practice various activities of creativity, they enhance capacity to develop a suitable learning environment full of interest, active participation with fluency, flexibility and originality in ideas. The most important aspect is that these ideas are novel with values. These prospective teachers exercise their brain in various activities with divergent thinking. These activities actually transform fossilised mind into curious mind. Preparing charts, posters and models enhances their capability of very fine observation. Use of clay and carton to prepare 3D models reflect their flexibility and originality of divergent thinking. It also develops their motor skills. In 'run and paste' activity, they got the opportunity to express the

amalgamation of remembering of difficult bones' name with own understanding and enjoyed a lot with full active participation. This activity enhances their fluency of thinking with originality and live concept. The prospective teachers were very excited to play a character of bones, joints, ribs and skull during the drama or act of 'structure and function of skeleton system'. They got opportunity to express themselves with reflections. This act made them extrovert by leaving the shy nature. It helps to remove hesitation to express them and energise their mind. *Nukkad natak* gives massage to common people about values of cooperation and coordination of each unit of social system. As the skeleton system functions smoothly whenever different bones and joints integrate and play their role with coordination, we will survive very smoothly in society whenever we work with coordination of each and every members of society. It also reflects the problem solving nature with fluency, flexibility, originality with values without sufficient resources.

The practices of creativity perform a significant role in increasing the participation of learners with their own interest with common goal and promote the expected learning with development of positive thought. The experimental group prospective teachers who were exposed for creative thinking outperformed the control group prospective teachers that received less creative thinking and creative performance. Thus, learners should be given opportunity and it should be made clear that whatever ideas they give will be accepted in very supportive ways and whatever opinion they have, it should be expressed freely. A teacher is a facilitator, resource manager, enthusiast, guide, prompter and the agent of expected changes. They should provide warm supportive atmosphere and all learners to make choice and to be a part of decision making process. Learners not only get the satisfaction of participation but self-motivate and come forward to attempt other assigned activities in their future life.

Educational Implications of the Study

On the basis of findings of the study, relevant literature and observations during the study, following are the educational implications which may help in developing creativity among learners—

- Prospective teachers must be motivated to have some original ideas.
- Teacher educators should focus on training of prospective teachers for the development of innovative ecology so that their creativity should be enhanced.
- Learners should be allowed adequate freedom in responding to a situation and to have their own way when they need a particular

kind of novel expression strongly enough.

- Learning experiences must be designed to foster creativity among learners. Curriculum should be quite flexible with provision for studying and working without threat of evaluation.
- There should be organisation of seminar, symposium, workshop and orientation programme time to time to exchange and reform their creative and innovative ideas on a particular platform.
- Teacher educators should themselves use inductive method to enhance the imagination of prospective teachers.
- The prospective teachers should provide independency and flexible learning environment so that they generate their novel ideas with free a mind set.

Recommendations

- There should be networking of Teacher Education Institutions through which each and every teacher get link with different activities of learning practices for creativity enrichment.
- This was conducted at Teacher Education Institution but it can be applied on schools and other higher educational institutions.
- Here only four types of activities are applied; other activities should also be applied for better results.
- The research should be conducted on large sample for generalisations of the findings.
- This research is conducted on 'science discipline'. It may be applied on other disciplines.

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Metacognitive Awareness of Classs XI Students in relation to their Self-Regulation

AMANDEEP KAUR* AND NAVDEEP KAUR**

Abstract

Self-regulation is a highly adaptive attribute of human beings, and it helps the learners to plan and organise the task, set goals, and self-evaluate themselves at each step of task completion. Self-regulation has a strong association with different learning situations that are metacognitively guided. The current study examined the metacognitive awareness of Class XI students in relation to their self-regulation. The participants (n=240) were the students of five senior secondary schools of district Amritsar, Punjab. Metacognitive awareness inventory and self-regulated learning scale were used to assess the metacognitive skills and level of self-regulation among students. The relationship between metacognitive awareness was examined by using correlational and regression analysis. The difference between metacognition and self-regulation based on gender was examined by using a t-test for independent samples. The findings of the study indicated a significant and positive relationship between self-regulation and the metacognitive awareness of students. Focusing on gender, no significant differences were found in the metacognition and self-regulation of males and female students. The results of the present study are discussed in light of previous studies.

INTRODUCTION

We are living in the era of knowledge explosion, and this knowledge explosion has resulted in the obsolescence of information even before it is acquired by us. In such a situation, it is the responsibility of educators to prepare their students for life-long learning. Educators must follow a learner-centered approach

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at an early stage of education as it motivates the students to learn, and inculcation of this attitude will prepare them to regulate their learning in response to interpersonal and intrapersonal conditions. Dunlap (2008), "The ability to engage in lifelong learning is based on the development and successful application of two skills areas: Metacognition and self-directedness. Metacognition means active control over the cognitive processes engaged in learning". It is the combination of metacognitive knowledge and metacognitive regulation of one's cognitive processes (Schraw, 1997; Zabrucky, 1998; Schraw and Dennison,1994).

Metacognitive knowledge is associated with knowledge of the learner about themself and with those factors that might impact their performance in learning situations. Flavell (1979) described knowledge about cognition as knowledge about one's capabilities and limitations. Flavell (1979) further classified metacognitive knowledge into three parts: declarative knowledge (factual information that one knows about himself and his surroundings), procedural knowledge (knowledge about how to perform a particular task and follow various steps), conditional knowledge (knowledge about why to select a particular strategy, when to use this selected strategy and when not to use it).

Flavell (1979) described metacognitive knowledge in the context of cognitive experiences also. It describes perceptions of a people which they experience during the process of cognition. Metacognitive regulation is the monitoring of one's cognitive process and associated with the use of different strategies to plan the task, awareness about task performance, and evaluation of the task and selected strategies. Regulation of cognition consists of several different sub-elements: planning, selecting, monitoring, debugging strategies, and evaluation of strategies. Flavell (1979) and Schraw (1995) observed a close association between metacognition knowledge and metacognition regulation. Schraw (1998) discussed several empirical studies that showed that metacognitive knowledge facilitates metacognitive regulation and the knowledge monitoring process. In this context, research work done by (Schraw 1994, 1997) reported that metacognitive knowledge and metacognitive regulation are significantly related only to those learners who have high monitoring ability.

In cognitive psychology, researchers have also found a close association and relationship between metacognition and motivation, self-regulation, self-efficacy, critical thinking, and analytical ability. In this context, Marzano et al., (1988) stated that the more the students are aware of their cognitive process during learning, the more they control the matters such as the organisation of tasks, goals, critical thinking dispositions, and their attention. Metacognitive practices enhance the abilities of students to adapt their learning to new tasks

and contexts (Bransford et al., 1999; Palincsar and Brown, 1984).

Metacognition involves awareness about how we learn, why, and when to adopt a particular strategy, implementation, and evaluation of strategy. Metacognition enables an individual to select a particular strategy in a particular situation for a particular problem and retrieve that strategy in a similar but new situation. Metacognition is a set of multidimensional skills and these skills are empirically distinct from general intelligence (Schraw, 1998). In terms of metacognitive skills, self-regulated learners are efficient organisers. They plan the task, organise it well, set goals, and follow the process of self-evaluation at each step of task completion during the process of knowledge acquisition. Self-regulated learning entails cognition, metacognition, motivation, and critical thinking (Schraw, 2006).

Self-directedness or self-regulation is a highly adaptive attribute of human beings. It helps in the alteration of the responses which include cognitive, affective, and habitual patterns of human behaviour. In the field of educational psychology, efforts have been made by different educationists and researchers to define the concept of self-regulation. Self-regulation may be perceived as the degree to which students motivationally, metacognitively, and behaviourally participate in the learning process (Zimmerman and Reisenberg, 1997).

Paris and Paris (2001) stated that self-regulation emphasise autonomy and control by the individual who plans, monitors, directs, and regulates action towards the goals of information acquisition, expanding expertise, and self-improvement. Self-regulation is defined as self-regulated thoughts, feelings, and actions for attaining academic goals (Zimmerman, 2002). Self-regulation is a self-directive process by which learners transform their mental abilities into academic skills and through these skills they achieve goals in academics and their life. Self-regulation is a process that students use to initiate, activate, and sustain their thoughts and motivate their behaviour and emotions to reach a goal (Zimmerman, 2002).

There are three components of the self-regulation process: (a) selection of goal (b) plan for action (c) a cybernetic cycle of behaviour which includes a series of activities. Goals, at the most general level, are centered around what a person 'wants to be or what to become in their life'. A plan of action is prepared by adopting a specific or general goal in life and it includes gathering relevant and context-related information, selection of appropriate strategies, and engagement in practical activities. During the behavioural practice, the cybernetics cycle of behaviour is followed by an element of control and this element is in the form of negative feedback control. But it does not mean that the

person will experience an unfavourable or bad situation, it means to act in response to some matched standard of behaviour. The element of control is followed only to reduce discrepancies. The cybernetic cycle of behaviour includes the processes from initiation of a task to the achievement of the goal. In the context of goal orientation, education researchers have studied various cognitive and affective factors of behaviour. They reported that goal orientation and belief about the importance of the task are positively related to cognitive, metacognitive, and self-regulatory strategies (Meece et al., 1988; Pintrich and De Groot, 1990).

Self-regulated students plan their activities in an effective way and adopt different strategies to set their goals. They motivate their emotions and behaviour to get success (Zimmerman, 2002). They manage resources, adopt different strategies, and monitor their level of progress. Self-regulated students evaluate the progress of their tasks regularly and are likely to achieve a higher level than those students who are dependent on their teachers. Self-regulated students are more proactive and receptive than others as they have a flexible attitude and they continuously adjust their strategies in response to their level of progress, social-emotional, and contextual conditions. They are diligent, resourceful, and ambitious to gain new information. They strategically approach education and when they encounter barriers in their learning process such as the lazy attitude of teachers, poor study conditions, or uncongenial school environment then they analyse the reasons for the non-occurrence of learning events as planned and revise their strategies to overcome the problem.

The term 'self-regulated learning' has a strong association with various forms of learning that are metacognitively guided and at least intrinsically motivated and strategic (Zimmerman,1990 and Winne, 1995). Self-regulated learner adopts suitable strategies to plan a task, regularly monitor, and also evaluate when and why to use a particular strategy for goal achievement. Zimmerman (1998) discussed three phases of self-regulation which include metacognition in itself. So, the self-regulation skills of learners determine the monitoring of metacognitive knowledge and metacognitive experiences.

Many researchers took the assumption of mindful use of regulatory processes specifically knowledge of cognition and regulation of cognitive may presage effective use of learning strategies (Flavell 1979; Dunlosky, 1998 and Hacker, 1998). Lee, Lim, and Grabowski (2010) advocated that when learning strategy prompted with metacognitive feedback, then it improved the academic performance of the learners. Sperling, Howar, and Staley (2004) found a positive correlation between self-regulation and three phases of self-regulation—metacognitive knowledge, academic strategy, and motivation. Isaacson and Fujita (2006) examined the relationship of metacognition

knowledge monitoring with self-regulated learning and academic success. The results of the study showed that high achieving students were more realistic in their goal achievement and more accurate at predicting their results.

The research work of Cera, Mancini, and Antonietti (2013) highlighted that lack of ability to self-regulate among students resulted in the inability of students to use appropriate cognitive strategies, as well as they, felt lack of interest in the activities of the school. Quality of student's regulation of activities helped them to become proactive and responsible as well as the development of metacognitive skills such as the selection of appropriate strategies.

Arslen (2014) found that metacognition was positively associated with self-regulation. The research work of Bol, Campbell, Perez, and Yen (2015) supported the effectiveness of self-regulatory skills to improve metacognition and enhance the level of achievement. Their study highlighted the importance of self-regulated learning skills to improve the metacognition of learners.

Further Oruc (2016) also presented similar findings of his research. He investigated the effects of learning with self-regulation on reading comprehension, attitude towards Turkish lessons, and metacognitive thinking skills and found that self-regulation significantly affects the reading comprehension and metacognitive thinking skills of students and research findings based on qualitative data showed that students in the experimental group used self-regulated learning skills while they study in the classroom.

Cetin (2017) reported that the total scores of student's self-regulation and metacognitive awareness were correlated with each other. Barokah, Budiyono, and Saputro (2020) studied the role of student's metacognition in solving mathematical problems based on gender differences and found significant differences in the metacognitive regulation of males and females in solving mathematical problems.

Research Objectives

Based on the findings of the previous research studies, the present study aims to examine metacognitive awareness of Class XI students in relation to self-regulation. Accordingly, the following are the objectives of the present study:

- To study the relationship between self-regulation and metacognition of Class XI students.
- To study whether self-regulation predicts the metacognitive awareness of Class XI students.
- To study the differences in self-regulation of Class XI students based on gender.
- To study the differences metacognitive awareness of Class XI students based on gender.

Research Hypotheses

Keeping in mind the objectives of the study, the following hypotheses are framed:

H1. A significant relationship will exist between self-regulation and metacognitive awareness of Class XI students.

H2. Self-regulation will significantly predict the metacognitive awareness of Class XI students.

H3. There will be no significant difference in the self-regulation of Class XI students based on gender.

H4. There will be no significant difference in the metacognitive awareness of Class XI students based on gender.

Methodology

Research Design and Sample

The present study falls under the domain of descriptive research. A sample of 240 students (males and females) was selected by using purposive sampling technique. The participants (N=240) were students of Class XI, and they were selected from five CBSE (Central board of secondary education) schools. Participants were selected by taking due permission from the principals of the schools.

Measures

Metacognitive Awareness Inventory (MAI)

To assess the metacognitive awareness of students, the metacognitive awareness inventory developed by Schraw and Dennison (1994) has been used. The investigators modified the language in the context of students' knowledge of the English language (English as the second language). It consists of 52 items in all and is divided into two subparts: Metacognitive knowledge (17 items) includes three sub-components: declarative knowledge, procedural knowledge, and conditional knowledge. Metacognitive regulation (35 items) includes five sub-components: information management strategies, planning, comprehension, debugging strategies, monitoring, and evaluation. Each statement has two options: true and false. Students are supposed to tick the option which they thought is appropriate. The coefficient of the reliability of the inventory was 0.85.

Self-regulated Learning Scale (SRL)

A self-regulated learning scale (Gupta and Mahtani, 2008) was used. This scale has 48 items and is classified into six dimensions. There are 40 positive and 08 negative items on the scale. The scale includes 5 sub-dimensions—self-awareness, planning and goal-setting, self-motivation, self-control, self-evaluation, and self-modification. The reliability of the scale is established with the help of the split-half method and the test-retest method by the authors. The coefficient of reliability of the scale is 0.88 and 0.98 respectively.

Administration of the Tools

The investigator contacted to the principals of the schools. Informed and written consent was taken from the principals. A rapport was established with the students before the administration of the test. The purpose of administration of tests was explained to students. Difficult terms and sentences were translated in the regional language of the students. The MAI scale and SRL scale were administered during the first period in every school. Information regarding confidentiality of responses was provided to students before the beginning of the procedure by the investigator. Participants did not receive any reward for their responses.

Analysis and Interpretation

Descriptive and inferential statistics were used to analyse the data, and hypotheses of the study were also kept in mind. The results are presented as follows:

Correlational analysis

To examine the relationship between self-regulation and metacognitive awareness of Class XI students, Pearson's correlation method was used.

The calculated value (r = 0.347) in correlational analysis indicates a positive and significant relationship between self-regulation and metacognition, and it is greater than the critical value (0.34 > 0.14) at 0.05 level of significance. Further to find the variance between variables, the linear regression analysis was applied to study the prediction of self-regulation on the metacognitive awareness of students.

The estimated regression weights, beta, t-value, and p-value for the predicator variable are mentioned in Table 2. It is observed from the Table that Self-regulation is a significant predictor of metacognitive awareness (β=0.348, p<0.00). The predictor variable (self-regulation) accounted for 12 per cent (R2=0.12) of variation in the metacognitive awareness of students. Table 2 reveals that metacognitive awareness is positively associated with self-regulation. The β coefficient (β=0.348; t=5.718, p<0.00) of self-regulation is contributed to the variance.

Table1
Relationship between Self-regulation and Metacognitive Awareness

Variables	Mean	SD	Coefficient of correlation	P-value
Self-regulation	151.42	23.73	0.347	.0001
Metacognitive awareness	36.4	5.06		

*Significant at 0.01 level of significance (p<0.01)

Table 2
Results for the Regression Analysis Taking Metacognitive Awareness as an Outcome Variable and Self-regulation as a Predictor Variable

Predictor variable	Outcome variable	R2	β	t	SIG (p-value)
Self-regulation	Metacognition	.12	.347	5.713*	.000

*Significant at 0.01 level of significance (p<.01)

Student t-test (Independent samples)

Further, to compare the mean scores of self-regulation based on gender (males and females), a t-test (Independent sample) was applied. The results obtained are shown in Table 3. The statistical analysis of data indicates that the calculated t-value between mean scores of self-regulation of males and females is 1.33 and less than the critical ratio (1.33< 1.64) at 0.05 level of significance. It can be inferred that no significant differences exist in the self-regulation of male and female students.

Table 3
Results for the t-test Between Variables Self-regulation, Metacognition, and Gender

Variables	Male (124)		Female (116)		t-value
	Mean	***SD***	***Mean***	***SD***	
Self-regulation	153.42	23.44	149.32	24.01	1.33*
Metacognitive awareness	36.25	4.93	36.46	5.13	0.33*

*not significant at 0.05 level of significance.

Further, to test the differences in the mean scores of metacognitive awareness of males and females, a t-test for the independent samples was applied. Table 3 shows that mean scores of metacognitive awareness obtained for variable gender (males and females) are 36.25 and 36.46 respectively and the calculated t-value (0.33 < 1.64) is less than the table value at 0.05 level of significance. Hence, it is inferred from the analysis that no significant differences exist in the metacognitive awareness of male and female students.

Discussion of Results

The present study sought to determine the metacognitive awareness of Class XI students in relation to self-regulation. The results of the study are discussed in light of previous studies related to metacognitive awareness and self-regulation.

The results of the study revealed that a significant and positive relationship existed between metacognitive awareness and self-regulation of students. Most relevant

to the present study, Shahmoradi and Askarian (2015) reported a significant and high correlation between metacognition and self-regulation, and the study also showed a significant and positive relationship between all the sub-dimensions of metacognition and self-regulation. Linda Bol et al., (2015) suggested that training in self-regulated learning improves the metacognitive awareness of students in developmental math courses. Oruc, Ayse, and Ali (2016) found self-regulated learning significantly increased the metacognitive skills of students in the learning process.

Focusing on differences in metacognitive awareness and self-regulation of Class XI students based on gender, the results of the present study seem to go in the same way as the other studies have found. Hong, Peng, and Rowell (2009) examined differences in the student's homework self-regulation and found male and female students did not differ in homework self-regulation. Haron, Mustafa, and Alias (2010) examined the influences of gender on emotional self-regulation and reported that gender is highly correlated with emotional self-regulation and females had higher self-regulation as compared to males. Further, Hashempour, Ghonsooly, and Ghanizadeh (2015) reported no significant differences between males and females students regarding self-regulation and metacognitive awareness in English translation studies. Sajja (2019) found no statistically significant difference between the self-regulation of males and females.

About differences in the metacognition of males and females, the present study reported no significant differences in this regard. Jaleel and Premchandran (2016) found no significant differences exist in the metacognitive awareness of secondary school students based on gender. Misu and Masi (2017) found no significant difference between the metacognitive awareness of males and females based on mathematical ability. But contrary to this, Lilina and Lavinia (2011) reported that generally both girls and boys use their metacognitive skills in the learning process and found that significant differences existed between boys and girls on the following aspects—use of prior knowledge in problem-solving and in planning a task, knowledge about one's strengths and weaknesses, selection of various strategies and monitoring of the task. Vinitha and Indu (2015) also reported a significant difference in the metacognitive awareness of boys and girls of secondary school students.

Findings of the Study

The main findings of the study are:

- A significant and positive relationship exists between metacognitive awareness and self-regulation of Class XI students.
- Self-regulation is a significant predictor of metacognitive awareness.

- No significant difference is found between metacognitive awareness of Class XI based on gender.
- No significant difference is found between the self-regulation of Class XI based on gender.

Conclusion

To sum up, the present study indicated a significant and positive relationship between self-regulation and metacognitive awareness of Class XI students. It explains that the students, who possess abilities like self-awareness, self-control, and self-modification, are metacognitively guided and can regulate their tasks in a systematic and structured way. They are capable enough to select appropriate strategies to carry out a task and evaluate their performance at regular intervals. The findings of the study also indicated that no significant differences existed in the metacognition and self-regulation of Class XI students based on gender. Both the gender selects suitable strategies to plan and design the learning-oriented task. They are aware of their thinking processes and execute their plans in an organised way. From the results, it is concluded that self-regulation plays a significant role in predicting the metacognitive awareness of students and determines the monitoring of metacognitive knowledge and metacognitive experiences.

Declaration of Conflicting Interests

The author(s) declared no prospective conflicts of interest concerning any issue related to authorship of research work or publication of this research article.

Ethical Approval

All the procedure of data collection was performed following the ethical standards. Written consent was obtained from the principals of the schools and informed consent was obtained from the students who participated in the study.

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Educational Status of Scheduled Tribes in Erstwhile State of Jammu and Kashmir

Contesting the idea of Inclusion

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Abstract

The role of education is crucial in progress towards creating more inclusive and just societies. It is the most effective tool for overcoming the exclusion of economically and socially marginalised sections of the society. The Scheduled Tribes represent one of the marginalised sections of the society lagging behind in most of the human development indicators especially literacy. The paper argues that despite constitutional guarantees and other related efforts, the Scheduled Tribes of Jammu and Kashmir continue to lag behind in education as compared to the mainstream population. The paper aims to investigate the educational status of Scheduled Tribes in Jammu and Kashmir by highlighting the trend of their literacy rate, gross enrolment ratio and dropout rate. Tribal education is a matter of great concern in Jammu and Kashmir, which necessitates the removal of disparities and equalisation in educational opportunities by addressing the special needs of those who have been deprived so far.

INTRODUCTION

Socially inclusive societies recognise and accept all citizens thereby inculcating in them a sense of belonging. Enhancement of human well-being requires inclusive growth with a greater focus on development and planning, and reduction of inequalities among vulnerable social groups like Scheduled Tribes (STs) and Scheduled Castes (SCs). This well-being encompasses attainment

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at various levels like education, employment, healthcare, nutritional level and other amenities for individuals besides guaranteeing them civil rights and protection against atrocities and crimes. Amartya Sen (1999) stated that unless the capabilities among human beings are adequately addressed and deprivations faced by marginalised groups overcome, development cannot take place (Brahmanandam and Basu, 2016). The basic tool for achieving well-being and development at the individual as well as the social level is the provision of education to the citizens. Education is the most effective and crucial tool for empowering people. It acts as a primary vehicle for empowering the socially and economically marginalised sections of the society like the STs and helps them raise from the existing levels of poverty. Unless these underprivileged sections of the society receive the minimum required education, they cannot exercise their civil, political, economic and social freedom (National Commission for Scheduled Tribes, 2005–2006). Education enables them to have greater awareness, better comprehension of their social, political and cultural environment and also facilitates improvement in their socio-economic conditions (Ministry of Tribal Affairs, 2013). Hence, the education of STs has assumed special importance in the context of planned development of the human resource.

To work out a broader policy for educating the Scheduled Tribes, the Dhebar Commission (1961) established the appropriateness of Mahatma Gandhi's concept of 'basic education' to the tribal societies (Report of the Scheduled Areas and Scheduled Tribes Commission, 1961). The Kothari Commission (1966) highlighted that 'intensive efforts' must be made for providing early education up to five years to all tribal children. The Commission also suggested educating their parents simultaneously to achieve a literacy rate among the tribals. A centrally sponsored scheme (Scheme for Construction of Hostels for ST Girls and Boys) was launched in 1961 to promote literacy among tribal students. The Tribal Sub-Plan (1974–75) also accorded priority to the promotion of education among Scheduled Tribe children and women (Xaxa, 2011). The N*ational Policy on Education* (1986) has paid special attention to the education of the Scheduled Tribes. The policy suggests the expansion of residential schools, including Ashram Schools, *Anganwadis* and Adult Education Centre's to promote the tribals to higher education, especially technical, professional and para-professional courses. The policy includes the provision of incentives for tribal students in the form of scholarships, special remedial courses and other programs removing psycho-social impediments. The *National Policy on Education*, (modified in 1992) also

emphasises the positive role of education in removing social and regional imbalances, empowering women and in securing a rightful place for the disadvantaged, linguistic groups and minorities (Report of the high-level committee on socio-economic,health,andeducational status of tribal communities of India, 2014).

In 2002, the 86th constitutional amendment codified the right to education as a fundamental right by introducing article 21A in the Indian constitution. Though the Article was inserted into the constitution in 2002, it was only in 2009 that the *Right to Education Act* was enacted to provide a statutory framework for the realisation of the right to equality in elementary education. The RTE Act guarantees free and compulsory quality education to every child in the age group of 6–14 years and obligates the state to satisfy that right. Furthermore, section 12(1) of the act mandates that the unaided private schools must fill 25 of their students with children from weaker and disadvantaged sections of the society free of cost to foster diversity and to eliminate segregation and discrimination (Kothari, 2018).

The Twelfth five-year Plan (2012–17) with the objective of inclusive growth demands that all social groups have equal access to the services provided by the State and equal opportunity for upward economic and social mobility (Government of India, 2015). Thus, the promotion of ST education would support the Eleventh Plan endeavour in equitably distributing the growth benefits among the ST community and other sections of the society (Sanjeev, et al., 2017). Furthermore, reservation policy has been advocated as a strategic tool for bringing the spatially and culturally isolated Scheduled Tribe community into mainstream society. This is sought to be achieved through provisions for preferential treatment in education, government employment, and reservation of seats in parliament, state legislatures and local bodies.

Education thus helps the socio-economically and educationally backward tribal communities in achieving the minimum baseline for their inclusion in the mainstream of society. Education establishes equilibrium and wards off the forces of disintegration. It is the single most important means by which individuals and society can improve personal endowments, build capacity levels, overcome barriers, and expand opportunities for sustained improvement in their well-being. So, education is an important avenue for upgrading the economic and social conditions of the STs (Sahu, 2014).

Prior Literature

Many studies have emphasised the importance of education for the marginalised groups in determining their chances of improving in prestige and economic position within

the society. Pawar et al., (1988) highlighted that that the policy of reservation in educational institutions for STs of Madhya Pradesh had helped to a limited extent. A small section of the ST population had benefited from this policy because of the fact that the literacy rate among the tribal people was comparatively low as compared to other communities of the state. Furthermore, literacy among females was also very low. Vakil (1982) analysed various socio-economic measures which were initiated for the welfare of STs in Andhra Pradesh. He argued that the real poverty stricken STs and backward classes do not seem to get much from the various economic schemes. Jain (1987) explored that an overwhelming majority of STs are facing acute social and economic disabilities. The crucial factors that have contributed to these disabilities are lack of education, literacy, employment opportunities, assets, institutional credit and services on fair terms and indebtedness, humiliating conditions of life and work and social oppression.

Reddy (1990) highlighted the problems faced by STs in developing tribal literacy in Andhra Pradesh. Xaxa (2001) analysed that STs experienced exploitation at the economic level and domination at the political level. The tribal societies suffered from the absence of interdependence, division of labour/occupation and corresponding heterogeneity of valves, skills, knowledge, income, wealth, status and privilege. Subramanyam (2003) found that due to poverty and economic reasons, the dropout rate among children belonging to STs is highest among school-age tribal children. Xaxa (2015) opined that though reservation provides employment opportunities, the lack of educational qualifications and necessary skills denied them of the jobs, and the reserved seats remain vacant in many cases. The reasons for the educational backwardness among STs can be categorised as external, internal, and socio-economic. The external constraints are related to problems and difficulties at levels of policy, planning, implementation, and administration. Internal constraints are related to problems associated with the school system, content, curriculum, medium of instruction, pedagogy, academic supervision, monitoring, and teacher-related problems. The third set of problems relates to the social, economic, and cultural background of STs (Sujhata, 1994). The socio-economic status, nature of households, parental income, wealth, education and occupation, has been known to be the major determinants of educational enrolment and achievement (Shavit and Blossfeld, 1993). There is ample evidence that children of better-educated parents more often go to school and tend to drop out less (Huisman and Smits, 2009).

Objectives of the Study

The study was undertaken to assess the overall educational status of STs

in Jammu and Kashmir including the present status, vulnerabilities, threats and gaps in the fulfillment of school education among the children of STs of Jammu and Kashmir. The study also aimed to highlight the nature of access and quality of education for STs for which the number of institutions, school enrolment, school dropout rates and gender parity index were used as primary indicators.

Sources of Data Collection

The study is primarily based on data collected from secondary sources including official reports of school education department, Ministry of Human Resource Development, Bureau of Planning, Census documents of India, books, journals, research papers and other non-governmental reports. Besides, a survey of relevant literature was also carried out to gain an understanding regarding the educational status of Scheduled Tribes.

Results and Discussion

The erstwhile state of Jammu and Kashmir (in India) is a multi-ethnic, multi-religious and multi-lingual region having a population of approximately 12,548,926. The erstwhile state is geographically and culturally divided into three divisions — Jammu, Kashmir and Ladakh (Jahangir and Shafi, 2013). However, with effect from October 31, 2019, the state now administratively stands divided into two Union territories, viz., 'Ladakh' and 'Jammu and Kashmir'.

Tribal Setting in Jammu, Kashmir and Ladakh

The total population of the STs in the erstwhile state of Jammu and Kashmir, as reflected in Table 1, is 1,493,299, comprising 11.9 per cent of its population and about 0.14 per cent of the total tribal population of the country (Census of India, 2011). Under the Constitution (Jammu and Kashmir) STs Order, 1989, eight communities were declared as STs in Jammu and Kashmir. However, with the constitutional (Scheduled Tribe) order (Amendment) Act, 1991, there was further inclusion of certain tribes in the list of STs specified in relation to the erstwhile state of Jammu and Kashmir thereby declaring 12 communities as STs. These are Balti; Beda; Bot, Boto; Brokpa, Drokpa, Dard, Shin; Changpa; Garra; Mon; Purigpa; Gujjar; Bakarwal; Gaddi and Sippi.

Majority of the tribals of the Jammu and Kashmir inhabit the rural areas. It is pertinent to mention here that there are around 766 villages which have more than 50 per cent ST population (ibid.).

Literacy of STs of Jammu, Kashmir

Education is becoming widely recognised by several countries worldwide as a means of developing an efficient human resource capacity that is required to ensure economic growth and sustainable development. The individual benefits of education

Table 1
Population Distribution of STs in Jammu, Kashmir and Ladakh

District	STs		
	Total	***Males***	***Females***
Kupwara	70352	36913	33439
Budgam	23912	12383	11529
Leh	95857	47543	48314
Kargil	122336	62652	59684
Punch	176101	90274	85827
Rajouri	232815	121374	111441
Kathua	53307	27693	25614
Baramula	37705	20237	17468
Bandipore	75374	39398	35976
Srinagar	8935	5021	3914
Ganderbal	61070	32554	28516
Pulwama	22607	11837	10770
Shupiyan	21820	11311	10509
Anantnag	116006	60990	55016
Kulgam	26525	13888	12637
Doda	39216	20377	18839
Ramban	39772	20940	18832
Kishtwar	38149	19889	18260
Udhampur	56309	29142	27167
Reasi	88365	46330	42035
Jammu	69193	36323	32870
Samba	17573	9188	8385
Total	1493299	776257	717042

Source: *Census of India (2011)*

are well known. It ensures better employment, higher salaries and a greater ability to consume and save (Jahangir, 2012).

Table 2
Literacy Rate

Scheduled tribes	Total Population			Literacy (Percentage)		
	Total	***Male***	***Female***	***Total***	***Male***	***Female***
India						
All tribes	104,281,034	5,24,09,823	5,18,71,211	58.96	68.53	49.35
J&K						
All tribes	1493299	776257	717042	50.6	60.6	39.7
Tribe-wise Distribution in J&K						
Bakarwaal	113198	59621	53577	31.8	40.5	22.2
Balti	51918	26473	25445	71.1	82.5	59.3
Beda	420	216	204	68.7	75.0	61.5
Bot,Boto	91495	45295	46200	70.3	79.2	61.6
Brokpa, Dropka, Dard, Shin	48439	25240	23199	67.9	79.5	55.2
Changpa	2661	1355	1306	57.0	66.8	46.7
Gaddi	46489	23808	22681	53.5	68.2	38.2
Garra	504	275	229	71.3	81.3	58.8
Gujjar	980654	510710	469944	47.3	57.2	36.5
Mon	829	418	411	72.3	81.7	62.7
Purigpa	39101	20119	18982	67.5	78.6	55.7
Sippi	5966	3064	2902	53.1	66.1	39.2

Source: *Census of India (2011)*

Table 2 highlights that overall literacy rate of the STs is 50.6 per cent. This is much lower than the national average of 58.96 per cent aggregated for all STs. Male and female literacy rates (60.6 per cent and 39.7 per cent respectively) are much below if compared to those recorded by all STs at the national level (68.53 per cent per cent and 49.35 per cent). If on the one hand, *Balti, Bot, Garra and Mon* tribes have comparatively higher literacy rate, however, *Gujjar, Gaddi and Bakarwal* tribes, on the other hand, lag behind the national average. The literacy rate of the females among these tribes shows the similar trend. Thus, on analysing the figures, it can be assessed that the educational background of tribes is not encouraging when compared to the national level. The reasons for their educational backwardness are manifold. On the one hand, the satisfaction in their primary occupation does not push them

towards those occupations which primarily demand education as a pre-requisite; equally, on the other hand, the geographical disadvantages and subsequently the non-availability of adequate infrastructure do not attract them towards education. Besides the sense of insecurity of unemployment which prevails across the nation becomes another barrier for them to get educated, the only reason being that nowadays, people primarily understand education more as a tool of getting economic security (in terms of getting job) and less in terms of personality development.

Educational Infrastructure for STs

Schools and other educational institutions, as a main institution for imparting education in society, are established to make education universally available to people from all economic and racial/ethnic backgrounds.

Table 3
Number of Institutions in UT of Jammu and Kashmir

Institutions	Total
Universities (including NIT, IIT, IIM, IIMC)	14
Colleges	225
Senior Secondary/ Secondary Education Board	1
Senior secondary schools	597
High/Secondary schools	1194
Upper Primary Schools	6665
Primary Schools	14171
The Kasturba Gandhi Balika Vidyalaya	79
District Institutes of Education	22
Institutions for STs in Jammu and Kashmir	
Hostels	23
Total	22991

Source: *Government of Jammu and Kashmir (2021)*

The above table suggests that in the UT of Jammu and Kashmir, the total number of schools as education institutions is 22,991. However, the total number of senior secondary school (597) is less than secondary school (1,194). Similarly, the total number of upper primary schools (6,665) is less than the primary schools (14,171). Higher education sector has expanded over the past few years. The numbers of colleges have increased from 33 (in 2000) to 225 (in 2021) which include both private as well as government colleges in erstwhile state of Jammu and Kashmir. Besides, there is a total number of thirteen universities/deemed universities which are operational and cater to the needs of students. Higher education sector would improve further from the strength of its college system. But the focus should be laid on a long-term plan in terms of access to education and quality of education which is abysmally low and needs to be enhanced. There exist drawbacks in higher education in Jammu and Kashmir like the lack of learning materials, reference books,

teachers, remoteness of education facilities, high dropout rate, etc. Thus, the participation rates of population in higher education are quite low (RUSA, 2013).

Furthermore, there are two under-construction Eklavya Model Residential Schools exclusively meant for ST students for the promotion of education. Also, the less availability of hostel facilities (for 23 only) for STs to pursue their career in educational career without dropping out remains unfulfilled (Social Welfare Department, 2015). Moreover, the mobile primary schools commonly known as mobile schools were set up in erstwhile state of Jammu and Kashmir in 1970 to provide educational facilities to the children of nomadic Gujjar and Bakerwal tribes. These schools could not continue for long after the onset of armed conflict (Ali, 2013). However, some seasonal mobile schools (1163) continue in some areas of the erstwhile state of Jammu and Kashmir (Kashmir Times, 2013).

Table 3 shows that there has not been a considerable increase in the spread of educational institutions. Schools fall short for various reasons such as poor leadership, ineffective teaching, or misplaced priorities, inadequate funding, lack of community support, or communities strained by poverty and social dysfunction. The success of a democratic society depends on the competency of its citizens. Without educational institutions, the need to produce citizens who would understand political and social issues, participate in civic life, protect their rights and freedom and the society from inside and outside threats, will remain unfulfilled.

Enrolment in School Education

Though the education system has made significant progress over the past few decades, literacy of the STs has remained a matter of concern even after so many years of independence. Number of programmes for tribal development is related to the single sector of education. Sarva Shiksha Abhiyan was implemented as one of the main programme for universalising elementary education. The new law provides for a justifiable legal framework that entitles all children between the ages of 6–14 years to free and compulsory admission, attendance and completion of elementary education. It provides for children's right to an education of equitable quality, based on principles of equity and non-discrimination (Ministry of Tribal Affairs Statistics Division, 2013).

The table below shows the enrolment of STs by stages of Primary (IV), Middle/Upper Primary (VI–VIII) and Secondary/Sr. Secondary (IX–XII) levels of school education. The study highlights that there has not been a considerable increase in enrolment of STs at higher secondary schools. It is very less as compared to the enrolment in primary and elementary stages of school education. Thus, it is very important that the current efforts for promoting education among children from disadvantaged groups and weaker sections should have been a mix of both general and specific in order to enhance the enrolment ratio among

the scheduled tribes. General efforts include expanding infrastructure for physical access, incentives like uniforms, books, tracking disaggregated data to reflect social groups and gender dimensions, provision of mid-day meals, etc. Specific programmes include Hostels and scholarships for STs (Annual report of Ministry of Human Resource Development 2014–15).

Statistics at a Glance, 2012). After the enactment of Right to Education (RTE) Act in 2009, overall enrolment of students has moved up at all India level and in order to have more clarity on enrolment status of tribes in Jammu and Kashmir, the data in Table 5 below highlights the gross enrolment ratio of Scheduled Tribes. The GER of J&K tribal students declines significantly from 61.4 per cent to 2.0 per cent at

Table 4
Enrolment in School Education

Class	Scheduled tribes (Boys)	STs (Girls)	Total
Primary	69940	59897	129837
Upper Primary	29361	23593	52954
Elementary	99301	83490	182791
Secondary	10324	6591	16915
Senior Secondary	6560	4152	10712

Source: *Statistics of school education (2011–2012)*

Gross Enrolment Ratio

The gross enrolment ratio is useful in providing an average picture of progress over time. Gross Enrolment Ratio for any stage (Different Classes) is defined as percentage of the enrolment in that stage to the estimated child population in the respective age group (Educational

different stages of education. This shows a gap which is alarmingly high. Gender wise comparison also indicates that the Girls GER has declined from 58.6 per cent to 1.8 per cent whereas ST Boys have performed better than their counterparts during the same study period. This is due to low enrolment

Table 5
Gross Enrolment Ratio (GER)

Classes	ST (Boys)	ST (Girls)	Total
Primary	64.1	58.6	61.4
Upper Primary	47.4	42.0	44.8
Elementary	58.0	52.7	55.5
Secondary	27.9	20.1	24.3
Senior Secondary	21.8	15.8	19.0
Higher Education	2.3	1.8	2.0

Source: *Statistics of school education (2011–2012); All India survey on Higher education, MHRD (2013)*

and high absenteeism at lower levels of education which further hindered participation in higher education (Ambasht, 1970).

Gender Parity Index

Gender equality has been recognised both as a core development goal and a human right. The important determinant of society competitiveness is its human talent including skills, education and productivity of its workforce and women account one half of the potential talent base throughout the world. Thus, in order to maximise competitiveness and development potential, each society should strive for gender equality, i.e., to give the women the same rights, responsibilities and opportunities as men (Haussmann, et al., 2008). There are marked differences across and within regions as witnesses by the gender parity index. Gender Parity Index (GPI) serves as a significant indicator of the empowerment of women in society.

Table 6
Gender Parity Index

Class	GPI
Primary	0.91
Upper Primary	0.89
Elementary	0.91
Secondary	0.72
Senior Secondary	0.72
Higher Education	0.78

Source: *Statistics of school education (2011–2012); All India survey on Higher education, MHRD (2013).*

There has not been any considerable improvement in the gender parity index for ST children. GPI for STs is seen to be highest in the primary and elementary level of education and least for higher education. The findings of the study show that the progress towards gender equity and the level of learning opportunities available for women in relation to those available to men is not improving. Larger gender disparities are inconsistent with sustained rapid progress towards universal primary enrolment. This has brought new policy challenges for rapid progress in scaling up enrolment of female children of STs.

Dropouts

Dropouts reflect such students who leave school mid-way during an academic session and/or those who complete the grade but fail to enrol in the next grade. The factors identified to influence dropouts include poverty, low level of parental education, and long distance to schools, poor performance and poor attitude of teachers. The instances of dropping out of school have serious socioeconomic repercussions such as unemployment, augmented dependency ratio and increased proportions of child marriages in the rural areas (Abotsi, et al., 2018).

The data in the table highlights that the dropout rates are still very high at 81.7 per cent in Classes I to X vis-à-vis 44.2 per cent for all category students. For Classes I to V and I to VIII, ST dropout rates are 29.8 per cent and 61.7 per cent, respectively. The dropout

Table 7
Dropout Rates

Dropout rate of STs				Dropout rate of all categories		
Class	***Boys***	***Girls***	***Total***	***Boys***	***Girls***	***Total***
Classes I–V	27.9	31.9	29.8	9.8	6.8	8.4
Classes I–VIII	57.4	67.2	61.7	9.6	13.8	11.6
Classes I–X	79.5	84.6	81.7	45.5	42.6	44.2

Source: *Statistics of school education (2011-2012).*

rate of girls is higher than boys for both primary and elementary level of education. Furthermore, for every 100 ST students who entered Class I, only 61.7 completed elementary level in Jammu and Kashmir. Scheduled Tribe dropout rates show an increasing trend in school education (secondary level). Thus, the findings of the study reflect the lack of educational development and inability of STs to complete a specific level of education. Drop out does not happen overnight. In fact, dropping out is usually long process of student disengagement which includes educational performance, student's behavior, background of student's and family, school structures, resources and practices, and some educational system level policies (Lynche, 2010). Even socio-economic status is a stronger predictor of educational success. Student's personal factors also have an impact on his likelihood of low educational achievement and the risk of dropping out. Reducing dropout and reinforcing primary and secondary education quality and completion give high returns in both short and long term (OECD, 2012).

Conclusion

Exclusion of certain groups from mainstream social current is one of the most serious challenges facing the society today. Education is one of the dimensions of social inclusion of individuals and social groups in regular flows of contemporary society. It is an important means for reducing inequalities and exclusion of marginalised groups in society. Greater involvement in education system reduces the possibility for the creation of the 'culture of poverty', which is characterised by non-inclusion and non-participating in the main institutions of the wider global society, and a sense of marginalisation, dependence and helplessness (Slijepcevic, 2017).

The present study highlights that decades of educational development has not brought the desired effect of social inclusion of STs in the mainstream society. There has not been a considerable increase in enrolment of STs at higher secondary schools which is very less as compared to the enrolment in primary and elementary stages of school education. The GER of Jammu and Kashmir tribal students declines significantly

in different stages of education. The percentage of literates after graduation drops down to almost half in the post-graduation level and declines acutely onwards in technical or professional education. Thus, the increasing trend in the drop-out rate for STs is a matter of concern which reflects the lack of educational development and inability of STs to complete a specific level of education as this has an adverse effect on building capability and skills within the ST community. Thus, it is important to pay great attention to the educational advancement of the STs in achieving the minimum baseline for their inclusion in the mainstream of society. However, education of tribals cannot be left to short-term plan strategies. It is important that planners take a long-term view which is embedded in a meaningful policy framework for social inclusion of STs in the mainstream society. The planned approach for socio-economic development of STs should lay considerable focus on the access and outreach of education at all the three levels — elementary, secondary and higher. The emphasis has not been merely restricted to literacy and school enrolment but expansion of network of schools and spread of institutions of higher education. Furthermore, infrastructure needs to be provided to the existing schools to ensure the right and appropriate quality education to ST students.

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Teaching Aptitude of Pre-service Teachers towards Inclusive Education

Construction and Standardisation of IETAT

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Abstract

Teaching aptitudes of pre-service teachers towards inclusive education of students with disabilities were examined. A 50-item test was constructed based on the literature review, experts' judgement and pilot testing, and administered on the 552 pre-service teachers enroled in the first year of two-year Bachelor of Education program at thirteen teacher education institutions of Gujarat. The result of the study showed that the test found to have good reliability and validity. The participants had an average level of teaching aptitude towards inclusive education of students with disabilities. The paper concludes with the possible implications for teacher education institutions, stakeholders and policy makers.

Introduction

Inclusive education has been started since the last decade in India, to break isolation from special and general education, to bridge the gap between them and to mainstream Children with Disabilities (CWD) into general education to learn with other children without disabilities. For the education of CWD, the Government of India enacted many policies and legislative acts. Most recently, in the line of United Nations Convention on Rights to Persons with Disabilities (UNCPRD), the Right to Persons With Disabilities (RPWD) Act 2016

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was implemented for the inclusive education of CWD (Ministry of Law and Justice, 2016). Recognising RPWD Act 2016 and its provisions for inclusive education, the *National Educational Policy* (NEP, 2020) asserts that CWD will have opportunities for equal participation across the educational systems (Ministry of Human Resource Development, 2020). Besides incorporating the recommendations of RPWD Act 2016, the NEP (2020) addresses teachers' training as an important aspect for inclusive education because teachers' role is crucial for the successful implementation of the inclusive education programme. However, many teachers do not have necessary knowledge, skills and attitudes to carry out the work in inclusive setting (Evans and Lunt, 2002; Forlin, 2001). The reason may be due to insignificant progress in teachers' training. A majority of training institutes in India provide limited, if any, information about how to teach Students with Disabilities (SwD), thus, without adequate training, teachers may be resistant to the idea of including SwD in their classrooms (Sharma, Moore and Sonawane, 2009). Forlin, Douglas and Hattie (1996) and Forlin and Colleagues (2009) argued that the success of mainstreaming is largely dependent on the regular classroom teachers' ability and willingness to make adaptations to accommodate individual differences. In support of this argument, Smith (2000) noted, although positive perceptions and feelings may encourage appropriate policies and supportive integration practices, negative attitudes tend to sustain low achievement expectations and unacceptable behaviour in SwD. So, negative attitude among pre-service teachers, if not addressed during initial teacher education, may continue to hamper the progress of inclusive education efforts in schools (Forlin et al., 2009).

Based on the review of research on pre-service teacher preparation, Caroll, Forlin and Jobling (2003) reported that initial teacher programs tend to overemphasise knowledge acquisition and pay limited attention to practical skills for teaching a diverse range of students, including those with disabilities, and therefore the pre-service teachers lack confidence and have negative attitudes to inclusion. Looking at the limitations of general teacher education programmes in preparing teachers for inclusive education, selecting persons with aptitude towards teaching in inclusive education can benefit in making the IE successful.

Recently, Rehabilitation Council of India (RCI) implemented All India Online Aptitude Test (AIOAT) for admitting candidates in certificate and diploma level special education course. This AIOAT is meant only for the candidates who opt to be special education teachers. But, the general Teacher Education Institutes (TEIs) are neither conducting a pre-entry level test, nor they measure aptitude of the candidates before admitting them

into initial teacher training courses. The aptitude tests constructed so far were developed for the general teaching aptitude, and the researches have not come across studies that focused on teaching aptitude for inclusive education conducted in India. So, an attempt has been made in this study to construct such a test and standardise by implementing on pre-service teachers. The results obtained are presented in this paper with its possible implications.

Looking to the limitation of general teacher training courses in preparing teachers for inclusive education, there is a great need to prepare teachers for inclusive education and selection of persons with right aptitude for teaching in inclusive education. The right persons should be spotted out through proper testing and advised to join teaching profession and later on to the inclusive schools.

Most generally, Arts, Science, and Commerce graduates and post-graduates join the teaching field in India. But now, following the National Council for Teacher Education (NCTE) Guidelines 2014, Engineering, Pharmacy, and Master of Business Administration (MBA) pass outs are also permitted to join B.Ed. course. The general teacher education programmes are focused on preparing teachers for general schools and they are merely giving a subject on inclusive education where the pre-service teachers are equipped with a theoretical knowledge, but they have often limited exposure to and practice with SwD (Kumari et al., 2019). So, the pre-service teachers feel themselves untrained for inclusive education and after their training will hesitate to join inclusive schools. This might be the main reason for the shortage of the teachers for inclusive education. Thus, selecting right personnel for the inclusive education right before the teacher training course through the application of suitable scientific techniques is need of the hour.

Many academics in the field of inclusive education consider teacher education as essential for the implementation of inclusive education in the classroom (Ainscow, 2005; Sandhill and Singh, 2005; Booth et al., 2003). Before 2014, the general teacher education diplomas and degree courses available nationwide were offering an optional 'special education' paper to train and prepare teachers having interest in teaching SwD. However, it was not an integral part of the training and it did not train teachers to deal with the challenge, diversity and negative attitudes (Singhal, 2005). This results in distrust in both the special and mainstream education systems which leads some parents to keep their CwD at home for the fear of their abuse or neglect in the classroom (Zulka, 2005). Many surveys have found that teachers' attitude towards inclusion is not particularly positive (Ellins and Porter, 2005), and they expressed concern about their lack of preparation for inclusion and for teaching all learners (Forlin, 2001). Thus, selection of teachers with aptitude for teaching in inclusive

education could benefit in preparing teachers for inclusive education programme. The persons with high inclusive education teaching aptitude should be spotted out through proper testing and advised to join inclusive school after their initial training. Thus, admitting candidates with aptitude for inclusion can benefit in making the inclusive education successful to some extent.

Bingham (1937) defines aptitude as a condition that is indicative to a person's relative fitness for his readiness to acquire proficiency, potential ability and to develop an interest in exercising his potential capacity. Thus, when we say a person possesses an aptitude for teaching in inclusive education, it is assumed that he has a good proportion of the traits required for becoming successful as an inclusive education teacher. The magnitude of these traits may differ from person to person or even the number of traits possessed by each person may also differ as some may possess more traits while some may be less. A number of traits required for being successful teacher in inclusive education, compose as a whole the aptitude for teaching in inclusive education. Thus, the high or low aptitude for teaching in inclusive education is in proportion to the number of traits possessed by an individual. It also depends on the nature of traits possessed.

Estimating the aptitude for teaching in inclusive education, the factors that contribute to the success in teaching in inclusive education, should be measured through proper tests. The inclusive education teaching aptitude is in proportion to the number of such factors, and also in proportion to their magnitude and importance in conditioning success in teaching in inclusive education. By constructing a test on teaching aptitude for inclusive education, an attempt was made to satisfy a felt need of such test. Unlike other tests constructed so far meant for general teaching aptitude, this test is specifically prepared to measure aptitude for teaching in inclusive education.

Method

Construction of IETAT

The Inclusive Education Teaching Aptitude Test (IETAT) was constructed to measure the teaching aptitude of pre-service teachers towards inclusive education. The following steps were undertaken in the construction of IETAT.

Step 1: Identifying components

As a first step in construction of the IETAT, five components related to teaching in inclusive classroom were identified based on the sixteen experts' rating on importance of the components. A pool of 97 items under the five identified components was framed on the basis of literature review and informal discussion with the experts in the field of inclusive education.

Step 2: Development of scale (Draft form)

A 97 item IETAT was constructed in English. For each item, respondents could indicate their aptitudes by selecting an option from the four options given with each item.

Step 3: Review of the scale by an expert panel

A panel of sixteen experts working in the field of inclusive education was again referred with a working definition of teaching aptitude towards inclusive education and was asked to review 97 items and their ratings on importance of the items. The purpose of the ratings was to measure and establish the content validity of the scale. The panel was asked to review and provide their comments and suggestions on clarity, conciseness and wordings of items. Besides review, the experts were also asked to rate each item from essential, useful to not necessary for measuring teaching aptitude of pre-service teachers towards inclusive education. The panel rated 69 items as "essential" and 28 items as "useful" or "not necessary". Some experts suggested adding an item on Universal Design of Learning (UDL), few terminological changes and the rephrasing of some of the items. A second draft of the IETAT consisting 70 items which were rated as essential by the experts was constructed. The test was translated into Gujarati by the two language experts who were well familiar with both English and Gujarati language. The two translated scripts then given to an academician for finalising the Gujarati version.

Step 4: Pilot study

In order to determine the reliability (internal consistency) of the scale, it was administered to a sample of 50 pre-service teachers of a TEI. Time restriction was not implemented during the pilot testing of IETAT and the pre-service teachers were given chance to attempt every item of the test, but the time taken by the average number of students in attempting the whole test was noted down. The average time noted was 28 minutes. Considering the 2 minutes for reading instructions, time limit of 30 minutes was decided. The reliability of the scale was determined by computing bi-serial 'r' coefficient of correlation for each item. Twenty items with low coefficient of correlation 'r' value .20 were omitted and 50 items with coefficient values more than .20 were retained in the final IETAT.

Step 5: Final version of the IETAT

Finally, a 50 item IETAT was produced. This test was used to collect the data from the 552 pre-service teachers in the eleven TEIs of Gujarat state.

Participants

The population included all pre-service teachers of the Gujarat state pursuing their B.Ed. I [First Year] for the academic year 2016–17. Thirteen TEIs of eight universities of the Gujarat state were selected

randomly drawn through lottery method. All the first year B.Ed. students of the thirteen TEIs were invited to participate in the study. There were 50 seats per B.Ed. unit in each TEI. So, there were 650 students enroled in first year of two-year B.Ed. course. During the data collection, 98 students were either absent or opted out from the survey. Thus, a total of 552 pre-service teachers participated in the study.

Data Collection Procedure

Before distributing the test booklets, the purpose of the test was made clear to the pre-service teachers and they were instructed to read the instructions given in the test booklet carefully. Additional instructions were given orally like their performance in the test will not affect their career and the purpose is only to measure their teaching aptitudes for inclusive education. An assurance was also given about the confidentiality of information provided by them and they were instructed to return test booklets with answer sheets to the tester after attempting whole test. Their doubts and queries with regard to answering test items were also clarified.

30 minutes time limit was followed during the entire phase of data collection from all the thirteen TEIs, and almost all the pre-service teachers answered the test items within the prescribed time limit without any difficulty.

Data Analysis

One mark was assigned to every correct answer of the item and no mark assigned to the wrong answer. Investigator himself assessed all 552 answer sheets so there was no chance for scoring errors. After valuing all the 552 answer sheets, the scores obtained by the pre-service teachers in the test were entered in a Statistical Package for Social Sciences (IBM SPSS 23.0) for the purpose of statistical analysis of the collected data. The data were analysed by measuring central tendency (mean, median, SD, range), divergence, and chi-square. The reliability of the test was ensured by using split-half, Hoyt's method and K-R formula. The validity was estimated by using standard test scores and standard criterion scores. Later grade norm was established to classify the respondents based on their status of teaching aptitude.

Results and Discussion

Measure of Central Tendency

Table 1 shows the value of mean; median and mode are found to be 20.57, 20.55 and 20.51 respectively. These values indicate that there is no much difference between the mean, median and mode. Hence the distribution is normal and the selected sample is representative of the population. The highest score obtained in the test was '35' while the lowest score was '7'. The range between the highest and the lowest score was, therefore, (35 – 7) + 1 = '29'.

Table 1
Frequency Distribution, Mean, Median, Mode and SD of the Scores in IETAT

Score Intervals	Midpoint (X)	Frequencies (f)	Cum. Frequencies (Cf)	D	fd	fd2
31–35	33	17	552	+3	51	153
26–30	28	80	535	+2	160	320
21–25	23	181	455	+1	181	181
16–20	18	182	274	0	0	0
11–15	13	76	92	–1	–76	76
06–10	8	16	16	–2	–32	64
		N=552				

Mean = 20.57
Median = 20.55
Mode = 20.51
SD = 5.45

Nature of Frequency Distribution

The nature of the frequency distribution was studied in three ways, viz., through the measures of divergence, through the chi-square test and through the best fitting normal curve.

Measures of Divergence

From the Table 2, it can be seen that the value of Sk obtained in terms of percentile indicates a positive value (+0.03), but slightly higher than the Sk value obtained through in terms of frequency distribution (+0.01). The result obtained in terms of the frequency distribution and percentile differs slightly. According to Garrett, the two measures of Sk are computed from different reference values in the distribution, and hence, are not directly comparable.

The Kurtosis of the frequency distribution as shown in Table 3 is thus equal to 0.2527. The value is slightly less than 0.263. The negative direction of the deviation indicates that the distribution tends slightly towards leptokurtic. These results indicate that both the divergences are not at all significant of a 'real' discrepancy between the data and that of the normal distribution.

Table 2
Skewness of the Distribution

	Sk in terms of Frequency Distribution	Sk in terms of Percentiles	Significance	Critical Ratio [CR]
Skewness	+0.01	+0.03	0.3319	0.09

Table 3
Kurtosis of the Distribution

	Ku	Significance	Critical Ratio [CR]
Kutosis	0.2527	0.0119	-0.8655

Chi-square test

The calculated value of chi-square is found to be 2.548, which is less than the table values at 0.01 and 0.05 levels of significance. This also testifies to the normality of distribution. The data given in Table 4 were used to super-impose the ideal (best-fitting) normal curve on the obtained histogram given in Figure 1 on the whole, fits in with the obtained distribution well enough to warrant our treatment of data as normal. The distribution of the test score is, thus, taken as normal.

Best Fitting Normal Distribution Curve

The best fitting curve is to be superimposed on the obtained histogram. To plot a normal curve over this histogram, the height of the maximum ordinate (Y_0) was calculated, which was found to be 201.76 when the 'x' at the mean of the normal curve is '0'. The values of Y, the heights of the ordinates at different σ – distances from the mean, are found out from the statistical table B for the ordinates of the normal probability curve

Table 4
Chi-square Test of Normal Distribution for Whole Test

Score Intervals	Exact Score Interval	fo	X	X–M		Area P(x)	ΔP(x)	fe= N×Δ P(x)	fo-fe	(fo-fe)2	
31–35	30.5-35.5	17	30.5	9.93	1.83	0.96637	0.03366	19	2	4	0.2105
26–30	25.5-30.5	80	25.5	4.93	0.90	0.81593	0.15044	83	3	9	0.1084
21–25	20.5-25.5	181	20.5	–0.07	–0.01	0.47210	0.34383	190	9	81	0.4263
16–20	15.5-20.5	182	15.5	–5.07	–0.94	0.17361	0.29849	165	17	289	1.7515
11–15	10.5-15.5	76	10.5	–10.07	–1.86	0.03145	0.14216	78	2	4	0.0513
6–10	5.5-10.5	16	5.5	–15.07	–2.78	0.00272	0.02873	16	0	0	0
		N=552									2.548
Mean = 20.57 SD = 5.45		Degrees of Freedom (df) = 3					From the table at .01 level = 11.345 at .05 level = 7.815 Thus, the value obtained is less than the table values at both the levels and therefore the value obtained is not significant at both .01 and .05 levels.				

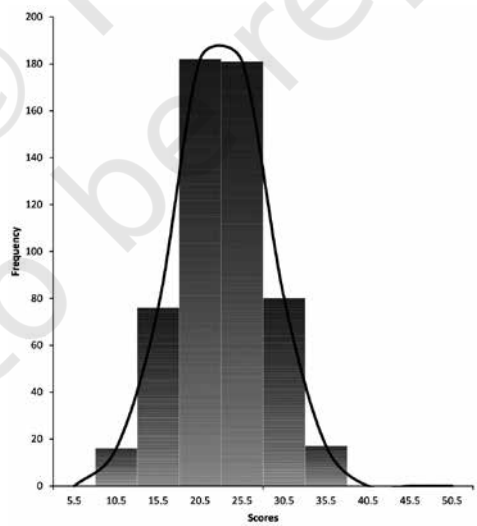
expressed as fractional parts of the mean ordinate, y_0 (Garrett, 1966, 4th Indian Reprint-2014, p. 459) and the corresponding values of Y when Y_0 = 201.76 are computed. The final values of the ordinates at different σ distances are given in the following Table 5.

The data given in Table 5 were used to super-impose the ideal (best-fitting) normal curve on the obtained histogram given in Graph 1. The normal curve on the whole, fits in with the obtained distribution well enough to warrant our treatment of data as normal.

Table 5
Normal Curve Ordinates at Mean

N	Mean	SD* (σ)	Y0 ()	σ distance from the Mean	Value of Y when Y0 = 1 (Read from Table)	Value of Y when Y0 = 201.76 (obtained from data)	Height of the ordinate
552	20.57	1.09	201.76	± 0.5σ	0.88250	0.88250 × 201.76	178.05
				± 1σ	0.60653	0.60653 × 201.76	122.37
				± 1.5σ	0.32465	0.32465 × 201.76	65.50
				± 2σ	0.13534	0.13534 × 201.76	27.30
				± 3σ	0.01111	0.01111 × 201.76	2.24

(**in class interval unit*)



Graph 1 Superimposition of the Best Fitting Curve on the Obtained Histogram for the Whole IETAT.

Reliability

Table 6 presents the reliability coefficient obtained through the application of 'split-half' method gives higher value (0.97). This might be due to the tendency of 'split-half' method to give the high value of reliability coefficient. The K-R formula 20 (0.65) and Hoyt's method (0.62) gives little identical results. Thus, the reliability of the present IETAT can be fixed at 0.75, and the value showed that the constructed IETAT is reliable at the satisfactory level.

been rejected. All the items in all the sections were included after a careful scrutiny. Only the valid items were selected while the items that were not found to be valid were summarily rejected.

Predictive Validity

The criterion against which the present IETAT is validated, is the examination marks of the pre-service teachers in the subject of Creating Inclusive School. The criterion was selected after a careful scrutiny, and

Table 6
Reliability Coefficient of IETAT obtained through Different Methods

Sr.No.	Method Used	Reliability Coefficient obtained	P.E.r
1.	Split-half method	0.97	0.0003
2.	Kuder-Richardson method	0.65	–
3.	Hoyt's Method	0.62	–

Validity

Content Validity

Content validity has been decided on experts' rating on the items constructed and the validity index of each item. The Content Validity Ratio (CVR) was calculated for each item based on the formula given by Lawshe (1975) for determining content validity of the test. The average of the CVR across all items on the test was found to be 0.64.

Construct Validity

For validity index, items showing .20 and more have been selected while items below .20 validity index have

all the consulted experts had agreed that the criterion is satisfactorily reliable and valid. However, it should be noted here that no criterion is a perfect one and it is extremely difficult to fix up criteria to judge success in teaching. So, the present criterion also cannot be a perfect one, but the investigator is confident that it is reliable and valid to the extent it is possible to reach in the present circumstances and limited researches in the field.

For estimating predictive validity, 20 per cent (110 pre-service teachers) sample is selected for determining the validity of the test. The raw scores on total test obtained by 110 pre-service

teachers were converted into the standard scores. The raw test scores, and raw criterion scores are converted into standard scores.

The examination scores on the subject of Creating Inclusive School taken as the criterion scores, and converted into standard scores. The raw scores are expressed in standard scores in a distribution where M= 39.36, M' = 50 and = 10.

The two sets of scores were arranged in the form of a scatter diagram and the product-moment coefficient of correlation was calculated. The scatter diagram pertaining to the standard test scores and criterion inclusive education examination scores are given in Table 7.

The product-moment coefficient of correlation 'r' was calculated according to the usual procedure from the scatter diagram shown in Table 7. The value product-moment coefficient of correlation 'r' was found to be 0.5195. The probable error of this 'r' also was calculated. It was found to be 0.01871. The predictive validity of the present test is much satisfactory and it can be said that the test is a good predictor of inclusive education teaching aptitude. Even then, obviously, other things being equal, the higher the correlation, the better it is.

Norms

The classification of respondents according to letter grades is given in Table 8.

Table 7
Standard Test Score and Standard Criterion Scores
(External Examination Marks in Inclusive Education Subject)

Scores 11–15		Standard Criterion Scores								fy
		16–20	*21–25*	*26–30*	*31–35*	*36–40*	*41–45*	*46–50*		
Standard Test Scores	46–50	–	–	–	–	–	23	–	–	23
	41–45	–	–	–	–	–	12	–	–	12
	36–40	–	–	–	–	1	–	–	–	1
	31–35	–	–	–	–	6	–	–	–	6
	26–30	–	–	–	–	2	–	–	–	2
	21–25	–	–	–	2	–	–	8	38	48
	16–50	–	–	–	–	3	10	–	–	13
	11–15	–	–	–	5	–	–	–	–	5
Fx		0	0	0	7	12	45	8	38	110

Product Moment r = 0.5195 P.E.r. = 0.1871

Table 8
Classification of Pre-service Teachers according to Letter Grades

Letter Grade	Limits of Raw Scores	Frequency	Teaching Aptitude Status
A	35 and above	1	Very high
B	Between 30 and 34	23	High
C	Between 25 and 29	106	Above average
D	Between 20 and 24	191	Average
E	Between 15 and 19	162	Below average
F	Between 10 and 14	59	Poor
G	9 and below	10	Very poor

Grade A and B suggest that pre-service teachers who are assigned this grade possess high aptitude for teaching in inclusive education, and that they would make excellent teachers in inclusive schools. One can enrol such candidates in TEIs or recruit in inclusive schools. Grades C, D, and E indicate decreasing magnitude of aptitude for inclusive education teaching aptitude possessed by the respondent pre-service teachers. The grade F and G suggests that pre-service teachers who are assigned this grade possess an extremely low aptitude for teaching in inclusive education, and that they would make very poor teachers. Such teachers should be eliminated for training in inclusive education or recruiting in inclusive schools. It would be advisable, therefore, to reject a pre-service teacher who scores, on this IETAT, 9 and below as they should be considered unacceptable to teach in an inclusive education. Thus, in selecting pre-service teachers for inclusive education, care should be taken to eliminate poor teachers from the beginning.

Implications

The norms established through the present study may be applied in comparing the performance of region-wise samples from the population of pre-service teachers. The pre-service teachers can easily be placed in particular grades, and the extent of their future success as the inclusive school teachers can be judged. Thus, the norms established by this study will be helpful to a reasonable extent in screening out the teachers who really possess the aptitude for teaching in an inclusive school.

The test norms will be mainly useful in selecting prospective teachers for pre-service level training, and they are most likely to be successful as teachers in inclusive education after the training. As there is a great dearth of trained teachers in inclusive education, the inclusive schools are required to employ untrained teachers, and such school

authorities may use the present IETAT in appointing the teachers who have teaching aptitude for inclusive education.

The test can also be helpful for vocational guidance purpose. If the test is applied to fresh graduate or post-graduate candidate, and if it is found, that they possess a good deal of teaching aptitude towards inclusive education, they may be advised to take up the teaching profession by joining teacher education courses.

Conclusion

The test items included in the IETAT numbering 50, based on the five components comprising teaching aptitude for inclusive education measures the inclusive education teaching aptitude to a considerable degree. The information obtained about the pre-service teachers' teaching aptitude for inclusive education through the IETAT is to be supplemented further with the information about their performance in the subject, interest, ability, and attitude before a final decision is arrived at with regard to his possessing a real teaching aptitude in an inclusive education. The distribution of the scores obtained by the pre-service teachers is normal and it suggests that a majority of the pre-service teachers coming under the average group do possess some kind of aptitude for teaching in an inclusive setting. The reliability and validity of the test are found to be quite satisfactory, and the test serves as a useful purpose in measuring inclusive education teaching aptitude of pre-service teachers.

Although the efforts have been made to make the present IETAT as much scientific and comprehensive as possible, it cannot be claimed that it is the perfect one as the items included in the test are only 50. Adding more items may further improve the test and make it a perfect one.

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From Academic Success to Mental Health
Everything is at Cost

ANIL KUMAR TEOTIA*

Abstract

The school closure's adverse effects are more visible on the younger children than elders, each day of school closure results in a slight loss in reading and mathematical learning outcomes. Further, school closure may delay the kids' cognitive, social, and emotional development, and it can have a spiral impact on future developmental tasks. In this article, the researcher has tried to present various school closure and related concerns. School closure automatically means the complete absence of school tours, visits, training, and other general things. The idea of online classes seems to be unfit for Delhi's children. This is also impacting the immigrants and first-generation children disproportionately as learning language and mathematics are limited to them. Different feelings at home were found to be nothing new—anxiety, stress, restlessness, etc. Students responded to reopen schools as soon as possible. We have to be aware of the learning loss and the potential learning crisis immediately after school reopening.

INTRODUCTION

The spread of novel coronavirus is still uncontrolled in India. The cases of infected persons and the number of persons deceased are high and continuously rising. The SARS-CoV2 virus is new to the family of coronavirus, which has resulted in this disease. SARS-CoV2 spread out first in Wuhan, China and then reach out to other parts of the world very quickly. World Health Organization (WHO) accepted human transmission through the droplets or discharge of nose, mouth, and eyes. WHO

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declared COVID-19 a pandemic, and asked all the nations to stay at home. When writing this article, the average per day new confirmed cases of coronavirus in India is over one lakh. This shows the level of uncontrolled spread of the deadly virus. To protect our kids from this virus, India closed its schools in the month of March 2020. It was not expected that this is going to last for such a long time. The schools are still closed across the entire nation causing academic, social, and mental pain.

Research about the coronavirus reveals that the transmission of the virus is higher in densely closed, indoor spaces and in public spaces where more and more people use the same facilities. The schools in India are over-crowded, and almost all students share almost all the schools' facilities, from drinking water to the restroom. This is seriously a gamble to let schools reopen with this known fact.

The school closed creates tension, restlessness, anxiety, psychological crisis, etc., among young children of the school (Thakur and Jain, 2020; WHO, 2020). This was evident from many types of research of western countries. The coronavirus effect is more severe in school children's lives and causes mental and academic losses. However, no study was done to determine the impact of this corona crisis on children's minds in Delhi.

This inspired the researcher to study Corona's impact on children's academic, emotional, and mental domains in Delhi's government schools.

Methods and Procedures

For this study, 110 students of the Delhi government schools, in North-East District of Delhi, were taken as the sample population. These students were of Classes 6–10 of different schools. The selection of these students was made based on reach, i.e., the easily reached students were made the sample population. Care was taken to include the variety of sections of the society (socio-economic level). This study's primary data collection includes online interviews through Google Meet and telephonic surveys, along with research literature. A questionnaire was used to collect data. It included many questions for open-ended responses. The questions mainly focused on the effects of corona pandemic on learning. Some of the parents were also interviewed. The methodology for the current study was reflective. The data collected were analysed for making all possible connections.

Result and Discussion

Pandemic: A Crisis for Children

The most visible effects of this corona pandemic on the children's lives include the schools' closure for a long time. Perhaps, it is for the first time in history when schools are closed for such a prolonged duration and at the national level. Every one of us will and are returning to normalcy expect children. The next few months will be very disappointing for some children, especially those

living in quarantine centres, and whose parents were tested positive because they will be hesitating to come to schools. The school closure may delay the kids' cognitive, social, and emotional development, and it can have a spiral impact on future developmental tasks (Ritchie and Tucker-Drob, 2018). The evidence of previous short-term school closure due to floods or any other natural calamities states that the school's negative effects are more visible on the younger children, each day of school closure result in a slight loss in reading and mathematical learning outcomes. Now, it has been almost six months of school closure; the effects on the attainment level will only be determined when children reach school. They will be drastic because the absence of valuable instructional time is the problem; the forgetting of already learned material will also be a severe concern. It will be tough for teachers to compensate for the loss incurred during this closure. Another research of United States tells that "In the United States, about 25 per cent of what is gained during the academic year is lost throughout the summer (Atteberry and McEachin, 2016; Kraft and Monti-Nussbaum, 2017) the effects in India will be more severe because Indians have low resources at home as compared to resources available to every American on an average.

Each passing week of school closer is reducing the learning outcomes of children, especially in primary grades. Advocating the importance of remote learning and online schooling can be considered acceptable this time, but this can never replace regular schooling. Students responded that it is easy for them to make connections, learn better, and focus on the content taught when they are in face-to-face mode and doing some activity under direct observation of teachers. School trips—visiting Delhi's museums and monuments, school camps—NCC or Cubs and Bulbuls, and other pleasant activities such as (co-curricular) activities of music, arts and culture, etc., are also on a break; this is going to impact the general knowledge of children about the nation and the world. The long-term effect of this time can be understood by a single statement, "The time spent in Education is positively correlated with intelligence scores (IQ) (Ritchie and Tucker-Drob, 2018)". It means that the adult IQ of our country is now at risk. Why? Since there is a complete absence of school hours and important instructional days, children are deprived of comprehensible input for proper development. This will impact the learning ability and cognitive ability of children in the long run because the critical learning period is on the edge of vanishing.

Moreover, the worst part of this situation is that we do not have a definite plan for reopening schools. Our planning is insufficient; the standard operating protocols are inadequate to meet the learning level

of students. Why? Let us understand the Standard Operating Protocol for reopening schools. Health Ministry of India has issued some guidelines for the partial reopening of schools only for Classes IX to XII. The schools outside the containment zones are allowed to reopen from 21 September. However, online learning shall be permitted as usual. The schools will be reopened voluntarily after the written consent of the parents, what does this mean? Are all students allowed to come to schools or a group of students? How will teachers assess the need of attending schools by specific learners? There are 'n' numbers of questions to be answered. If the schools will be opened voluntarily and all students will not attend school on a particular day, does it mean reopening them or just widening the gap again? Another problem in reopening schools from a different perspective is "The majority of the schools' students in the urban and rural area are difficult to be distanced socially. The spread of the disease will be accelerated by the proximity of the teachers and the children".

The Poorest are the Hardest Hit

Not all children are on the same edge. This will widen the already high inequalities in learners' attainment tests (LAT)—It is a test used for measuring the learning level of students each month in Kendriya Vidyalaya Sangathan. Research on the relation between school closer and attainment level states that "The learning loss depends mainly on children's socio-economic status" children belonging to the relatively wealthy family will have better learning opportunities at home. A recent study (Sevilla et al., 2020) found that "children from richer families are spending about 30 per cent more time on home learning than those from poorer families". Again, the learning of poor kids will be at risk. While talking with government school students about the satisfaction of learning, they were found to be disappointed. "*My parents cannot afford adequate internet access for online classes;"* another child added, "*I cannot learn from online classes. The teachers teach with intelligent students' speed, earlier we used to ask something during the face-to-face discussion, but now we are supposed to mute our mic in the classes. It leaves no space for us for better understanding"*, Sarita Class IX.

Another girl said, "*the educational resources are inadequate; we are not at par with our rich counterparts in schools. My home background is visible in the live class, and it makes me feel embrace in front of the class, children tease me after the class. This pandemic is a total loss".* When I asked a child to divert his mind from the pandemic crisis, "*what do you want to become in your life?"* He said, *"I do not want to be poor; I will do anything for becoming anything. Being poor is uncomfortable*".

Further, online schooling requires a good and reliable internet connection, a separate room for

studying, well-educated parents (with enough time), and many other things. So, the idea of online classes seems to be unfit for Delhi's children. This is also impacting the immigrants and first-generation children disproportionately as learning language and mathematics are limited to them. The dialogues with some of the parents of lower socio-economic status help us find their opinion about it. It is evident from parents' attitude to a poorer socio-economic status that they are unwilling to resend their children to school. They want them to put on the workforce to have economic support to already suffered family.

They have no money for taking specialised medical facilities in case the child is tested positive. Hence, this is a concern among low households for not sending kids to school. The marginalised poor sections will pay the most significant price. They will fall behind farthest. They will have the least resources to overcome this crisis. "*At last, the greatest price will be paid by us*"—Amit, a student. The children belonging to families of absolute poverty will be the most challenging reach after this pandemic gets over. Due to the loss of the daily bread or any personal loss, the child will be playing the role of bread earner in the family. The pandemic's economic effect is long term, and we have no readymade solution for skipping the economic slowdown. The child, who will be playing a crucial role in the family, will no longer be available to attend the schools anymore.

Different Feels at Home: A Dialogue with Delhi Government School's Students

Interviews with the students were made to find out the impacts of the school closed on the academic and personal lives of students at home. More than 97 per cent of the students interviewed told us that they miss school very much. When we asked them to share what they do at home all day, they responded almost in similar ways. "*We watch television from morning to evening; we watch the corona updates and the news for vaccines. Sometimes we play ludo or carom board."* The responses were not new at all. We are classifying our discussion into two parts based on the significance and the ideology we found. In the first part, we discuss the interactions with the students who wanted to return school, and in the second section, we discuss the interactions with the students who did not want the school reopening.

While discussing the feel at home, it was found that the students are feeling less enthusiastic at home; they are not doing any particular work and are spending hours just idling away. The questions about children's daily routine helped us know the things they are doing in this crisis. "*I wake up late in the morning and then lie down in my bed until it is too late; I often skip breakfast and snacks. My mom does not let my play outside (expect in my one neighbourhood house). I spent most of my daily time watching a cartoon on television. I feel all alone*

all day long. I am eagerly waiting for schools to reopen. I am missing my friends and teachers a lot", these were the wordings of some children of government school in Seelampur, Delhi. Many students agreed and had one thing in common, that is to say, the reopening of the schools. A larger share of the group interviewed showed a missing feeling for school.

Another group of the students shared many funny things; they nodded that they do not want schools to reopen, although this group was a minuscule minority. They thought they feel better at home with siblings; they play together and do not feel bored. "*We get up early in the morning to play with all our cousins and siblings; we eat together and dance together. We have the option of not taking online classes; we cannot be caught, we just say-internet problem. We watch television together and watch all the cartoons available. We play ludo, snake and ladder, carom board, chess, cards, video games, etc. We also play many outdoor games within the family on the rooftop/terrace and in the verandas of our house. We do not want schools to reopen. However, we miss our school friends, by the way."* These were the experiences of some children. Although they are not afraid of coming to school but do not want schools to reopen, they enjoy themselves at home. They are not missing school because of the company available at home. When we deliberately asked them about the lockdown and the stay-at-home orders, they said, *"We want to visit our relatives and friends now, we do not want to live this way."*

These poor kids are unable to predict the academic losses due to school closure. They will realise it soon. After returning to school, it will be tough for them to accommodate in the regular classroom and learn the appropriate outcomes at different stages. Teachers' experiences in online classes and remote teaching are evident that forgetting all the learned material is a significant concern. Students are not able to grasp the new concepts quickly because they have forgotten the previously learned material. A learning crisis is on its way! Let's be aware!

Another less concerned and more severe problem is drug abuse or the use of toxic substances by the children. This online culture, restriction on the social gathering, restriction on sports and games may result in use of tobacco and other toxic products by children. "More people are using drugs, and more illicit drugs are available than ever (*Drug Abuse amidst Pandemic—The Hindu*, n.d.).—A newspaper report". This corona crisis could make our children more exposed to the negative side of drug abuse. Anxiety and ongoing tensions are the main reason behind it. The economic recession may lead our poor kids on the wrong path of drug dealing too. We have many children having mental health issues, and they do not have the help they needed. Parents reported that earlier

they had help available from school counsellor and teachers, which is not available now. There are numerous reports of adolescent children using alcohols during the lockdown in India (*Lockdown Blues Driving Kids to Suicide?— The New Indian Express*, n.d.)—A newspaper report.

It is a situation of a pandemic within a pandemic. There is a great need for motivating children and caring for their mental health. Adolescents should be encouraged to do new things, play outdoor games (with precautionary measures), have local visits, and spend much time in family and talk with friends. Teachers should help them in feeling happy. Family too can help in this regard.

Findings

The main findings of the research are the following—

- This COVID pandemic is a learning crisis for children. The absence of proper instructions in specified situations is going to impact learning outcomes negatively. Teachers, be prepared!
- The vanishing of co-curricular activity is reducing the chances of learning general things. Along with the main syllabus, general knowledge is also suffering.
- There is a correlation between time spent in education and intelligence scores; thus, adult IQ of the nation is at risk.
- There is a strong urge to think to reopen of schools as soon as possible.
- There is the disproportionate impact of the pandemic on peoples of different socio-economic levels. Special efforts for reaching the unreached are required.
- All children are not at par. There is wide diversity in the availability of resources available to them. Think before planning any move.
- Children are losing all the patience they are having. They are distress and are not happy. This is going to impact their return to school.
- Almost all children want to return to school.
- The risk of drug abuse is increasing. We need to make specific arrangements for the counselling of adolescents.
- The idea of online classes is unfit for Delhi's kids. Online classes should not replace regular schooling.

Conclusion

The corona crisis was unprecedented. WHO declared COVID-19 a pandemic and asked all the nations to followed stay at-home orders. To protect our kids form this virus, India closed its schools in March, 2020. The schools are still closed in the entire nation causing academic, social, and mental pain.

In this present article, the researcher tried to analyse the different aspects of children's lives at home. This pandemic is a crisis for the majority of children. The school closure is delaying the developmental

tasks. The children may delay their different developmental domains during the corona crisis because of the absence of the instructional time and school hours. The impact will be drastic because the absence of valuable instructional time is the problem, but the forgetting of already learned material will also be a severe concern. We think that online classes can be considered acceptable for now, but these can never replace regular schooling.

The parents' attitude told us that some of them would not resend them to schools easily, and thus the negative impact of the pandemic will be disproportionate. In the last section of the paper, we have shared some of the children's opinions regarding the reopening of schools. Almost all children demand the reopening of schools.

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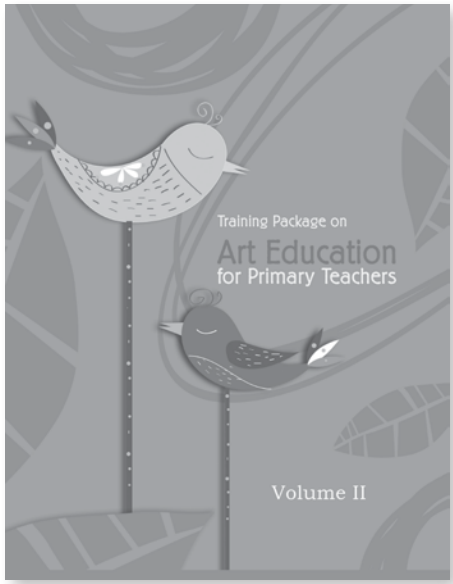

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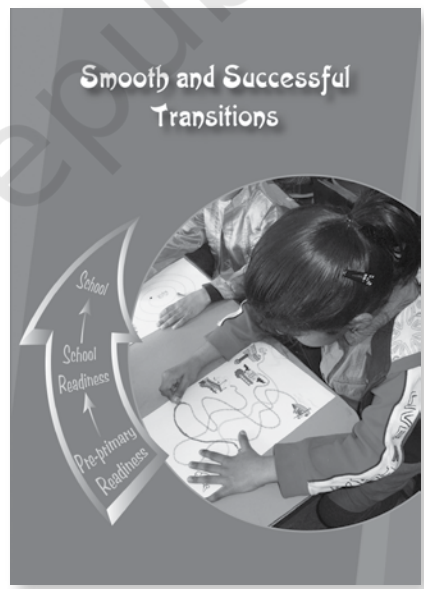

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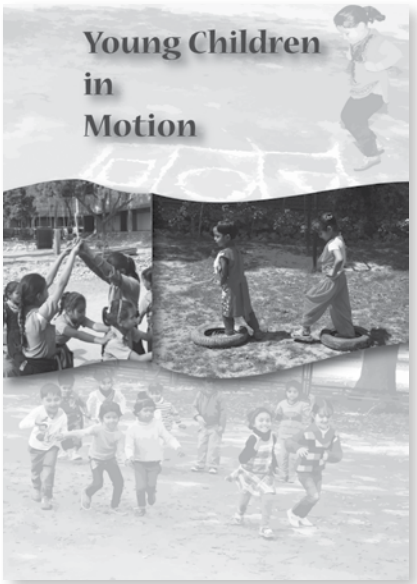

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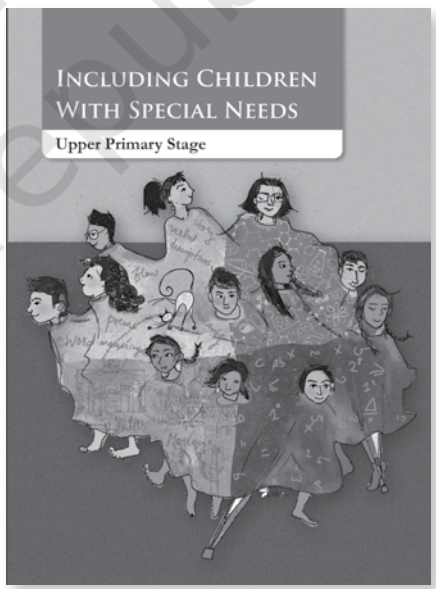

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