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Content

EDITORIAL

Education and educational processes in the 21st century scenario are becoming much complex owing to interplay of several interacting factors. Some of these factors arise from the technological and scientific resources arise while others are attributable to socio-cultural context emerging in the new millennium. The present issue of the journal, " Emerging trends in Education" explores these factors as well as tries to highlight the issues relevant in the present educational and scientific scenario. The first article Science Processes and Learning Environment as predictors of Achievement in Science is a research-based article which attempts to find out whether science processes and learning environment can predict students' achievement in science. The second article explores the interdisciplinarity in educational and various forms of research. In the third article Analysis of the relationship between school based variables and Happiness among Male and female students the author has given emphasis on various school related variables and their relationship with happiness.The fourth article is related to role of social network in shaping health behaviors. The study is based on the review of researches done during Pandemic. The fifth article discusses about the effect of Pentachlorophenol on the reproductive phases of catfish. The next article highlights the impact of globalization on women's health and reproductive rights. The role of artificial intelligence in expanding creative boundaries in contemporary painting is very well established in the next article. The other two articles are related to reform through the use of innovation in Rural education and relevance of the sayings of Swami Vivekanand for the youth who have to play the role in the development of India. At last a new section Book Review is being introduced in the journal. The present Book review is related to the book written by Dr Prithivish Nag on Transformation of Survey of India. The present issue of journal endeavors to contribute towards enhanced sensitivity in respect of new parameters and the allied bench-marks for treating the quality on journey rather than destination. We are hopeful that our readers as in the past , will share their views to help the emergence of the quality ethos being received in our educational process

Prof. Kalplata Pandey

Emerging Trends in Education [Vol. XI - No. 1 & 2. Feb. & August, 2024 . pp 01-05]

SCIENCE PROCESSES AND LEARNING ENVIRONMENT AS PREDICTORS OF ACHIEVEMENT IN SCIENCE

Karuna Shankar Misra*

Abstract

Science education is very essential at the middle school stage. Providing a conducive learning environment for the learning of science and science processes can influence students' achievement in science, the present study attempts to find out whether these variables can predict achievement in science. Sample consisted of 209 students of class VIII studying in Prayagraj. 'Test of science Process' and 'Learning Environments Inventory' constructed by the researcher and 'Science Achievement Test' constructed by Kalplata Pandey were used to collect the data. Analysis of the data was done by using step wise regression analysis. Findings revealed that science processes and four dimensions of learning environment namely- Competition, Favouritism, Creative stimulation and Diversity can predict variance in scores on....

Introduction

Science education in our country remains primarily didactic dominated by textbook reading, lecture, demonstration and thrust on memorization. Students usually perceive their teachers as knowledge-stores. Demonstrations by science teachers in laboratories or classrooms serve as models to be imitated as shown by teachers. Students try their level best to mimic them as accurately as possible. Practical notebooks of previous students help in writing the procedure followed and discussions of findings. Innovative practices to develop information processing abilities in science are seldom used by teachers. Traditional approaches to teaching science have been ineffective for fostering conceptual understanding in science. It is essential that students become competent in science process skills/abilities and experience the ethos of learning science. 'Science for all' is the target towards which educators must move. Irwanto, Rohaeti and Prodjosantoso (2019) stated that scientific process skills increase students' ability to absorb scientific knowledge; and develop critical thinking, decision making, and problem-solving skills. NEP (2020) has emphasized inquiry based, experiential and discovery-based learning. This can facilitate students' later placement in high level science courses. It seems that science processes and learning environment in science classrooms can influence students' achievement in science. The present study attempts to find out whether science processes and learning environment can predict students' achievement in science.

Review of Related Studies

Fredrick (2008) reported that gender has not much influence on the science

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process skills acquisition on the students. Aktamis and Ergin (2008) and Turpin (2000) concluded that students' academic achievement increased because of the activities carried out to develop scientific process skills in the science course. A positive relationship was observed by Feyzioğlu (2009), Harlen (1999), Jackson (2000), Koray, Köksal, Saat (2004), Sittirug (1997), and Unutkan (2006). Findings of Amaefuna (2013) revealed that students taught using science process skills methods performed better than their peers.

Riffat, Ghazala and Anjum (2011) conducted the study of relationship among Science Process Skills Acquisition, Achievement Motivation and Academic Achievement in English and Mathematics in Secondary school level. found that Science Process Skills Acquisition, Achievement Motivation and Academic Achievement are significantly related to the academic achievement.

Ahuja (2019) used a sample of 336 class IX students of three Government senior secondary school in Delhi for data collection through Misra's Test of Science Processes and Mid-term examination marks. It showed that there were gender differences in the favour of boys with respect to science process skills as well as academic achievement scores and science process skills and academic achievement were positively corelated to each other.

Ogbogu and Osuafor (2021) studied the relationship between students' level of science process skill acquisition and their academic achievement in biology among 6,400 senior secondary school students and found a significant positive relationship between the two variables.

The main purpose of the study done by Dolapcioglu and Subasi (2022) was to bring together the quantitative findings obtained on the relationship between scientific process skills and academic achievement in science education. 234 articles published between 2005 and 2020 were obtained. Following the application of the inclusion criteria, 18 articles were selected according to the random-effects model, resulting in an average effect size of 0.56. It was determined that there is a moderate and positive relationship between scientific process skills and academic achievement. As the use of scientific process skills increases, their academic success also increases.

Objectives of the study

The objective of the study is to find out whether 'Science process and learning environment contribute to prediction of variance in science achievement.'

Research Hypothesesis

It was hypothesized that 'Science process and various dimensions of learning environment predict achievement in science'.

Procedure of the Study

Sample: Sample consists of 209 students of class VIII studying in Prayagraj.

Tools used: 'Test of Science Processes' constructed by the researcher and

'Science Achievement Test' constructed by Kalplata Pandey were used to collect the data. Self-constructed Learning Environments Inventory was used to measure eighteen dimensions of teacher-student interaction in the classroom namely- cohesiveness, diversity, formality, speed, facilitation, friction, goal direction, favouritism, difficulty, apathy, democratic orientation, cliqueness, disorganization, competition, creative stimulation, encouragement, involvement and conformity.

STATISTICAL TECHNIQUES USED: Analysis of the data was done by using step wise regression analysis.

Results and Discussion

Table-1 Multiple correlations and 'B' showing predictors of achievement in science

Step No.	Variable	R	R-square	F for R	B
1	Science processes	.2736	.0749	16.7303**	.4460
2	Competition	.3524	.1242	14.6016**	.6391
3	Favouritism	.4122	.1699	13.9893**	-.4675
4	Creative stimulation	.4352	.1894	11.9192**	-.4226
5	Diversity	.4628	.2142	11.0663**	.4612

At the fifth step science processes and four dimensions of learning environment namely- competition, favouritism, creative stimulation, and diversity emerged as the best predictors of achievement in science. They together contributed to 21.42 per cent of variance in achievement in science. The values of R-square changes for science processes, competition, favouritism, creative stimulation, and diversity were .2736, .0493, .0457, .0195, and .0248 respectively. So, the percentage of variance contributed by science processes, competition, favouritism, creative stimulation, and diversity were 7.49, 4.93, 4.57, 1.95, and 2.48 respectively. 'B' values point to facilitative effect of science processes, competition and diversity and inhibiting effects of favouritism and creative stimulation.

It has been found that science processes contribute to prediction of 7.49 percent of variance in achievement. This draws support from the findings of Sittirug (1997), Harlen (1999), Jackson (2000), Saat (2004), Unutkan (2006), Koray, Köksal and Presley (2007), and Feyzioğlu (2009), Riffat, Ghazala and Anjum (2011), Ahuja (2019) and Ogbogu and Osuafor (2021) whose results revealed existence of a

positive relationship between science process skills and science achievement. Amaefuna's (2013) study has also revealed that students taught using science process skills methods performed better than their peers. Aktamis and Ergin (2008) and Turpin (2000) concluded that students' academic achievement increased because of the activities carried out to develop scientific process skills in the science course.

When science teachers lay emphasis on the teaching of science processes, a learning environment conducive to learning of scientific knowledge and conceptual understanding is created in the classroom and this can help students to achieve more. Findings of the present study indicate facilitative effect of science processes, competition and diversity and inhibiting effects of favouritism and creative stimulation. It has been found that 4.93, 4.57, 1.95, and 2.48 percent of variance can be contributed by competition, favouritism, creative stimulation, and diversity respectively.

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Emerging Trends in Education [Vol. XI - No. 1 & 2. Feb. & August, 2024. pp 6-13]

Exploring Interdisciplinarity in Educational and Various Forms of Research

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Abstract

Interdisciplinarity in research is important in addressing the research problems by using knowledge, techniques and perspectives of multiple disciplines and yielding effective outcomes through holistic understanding of the problem. It breaks the disciplinary silos and promotes more integrated approach towards knowledge development and creation. The present paper explores the interdisciplinarity not only in Education as a discipline and Educational Research but also in various forms of research viz. Fundamental, Applied and Action Research to foster 21st century skills and address educational challenges by gaining comprehensive and deeper comprehension of the complex issues. It has been evident that all the research forms thrive on an interdisciplinary approach and are useful in respect of arriving at truth, formulation of reliable generalizations and advancement of meaningful solutions.

Introduction

The interdisciplinary research plays a pivotal role in addressing the solutions of complex problems, promoting innovation and enhancing research quality. This type of research involves integration of knowledge, methods, techniques and practices from two or more than two disciplines for exploring new ideas and advancing solutions of the research problem. In other words, it addresses complex real problems by integrating knowledge and methods from multiple disciplines. It is evident that this approach promotes innovation, broaden perspectives and leads to more comprehensive solutions when it is compared to single discipline specific research. NEP 2020 also encourages the integration of knowledge and methods of various disciplines and aims to promote 21st century skills such as critical thinking, creativity, collaboration and communication through interdisciplinary learning. The objective of this policy is to create a conducive environment which supports and promotes such approach as the enabler to build and strengthen the research eco-system in Higher Education Institutions across the country. Education is an area of interdisciplinary research which tests theories, determines analytical relations and evaluates the worth of

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educational practices. The fields of educational research are too complex and fluid. The researchers have tried to explore and conceptualise them in multiple ways depending upon the activities and resources, ways of assessing and evaluating the outcomes and levels of education. The present paper explores the interdisciplinarity in Education as a discipline, Educational Research as well as in various forms of research such as Foundational, Applied and Action Research.

Interdisciplinarity in Educational as a Discipline

The discipline of Education provides a concrete exemplar of a firm yet fluid confluence of varying strands of conceptualizations in respect of socio-educational reality where formation of educational goals, determination of educational content and process; evolving of valid approaches to knowledge and understanding and identification of socio-educational issues of contemporaneous relevance, the traditional branches of philosophy such as metaphysics, epistemology and axiology have a significant role. This has also resulted in the emergence of a new discipline of education under the rubric Philosophy of Education which is no longer construed as a unilateral application of philosophy to education. Education is essentially a social process with its vicissitudes conditioned and even caused by political and social events. Thus, the study of this process requires a holistic and participative approach. In the Indian context the accepted frame of reference in respect of the goal of education as envisaged by the New Policy of Education (1986) and further assented to by the committee for review of NPE (1992) is in terms of Gandhiji's oft-cited articulation which says that purpose of education is 'to establish a non-violent and non-exploitative social and economic order. The National Education Policy (NEP) 2020 aims to transform the education system by focusing on holistic development and 21st century skills viz. Critical thinking, Creative problem solving, Communication and Collaboration. As a process, the goals and roles of education visualized are providing a 'techno-informative' base empowering the person with knowledge and on which one can build later; creating opportunities to acquire skills such as foundational skills in communication; computational social skills and manual skills.

Building a climate for nurturing the values as personalized set of values forming one's character including social, cultural and national values so as to have a context and meaning to actions and decisions and in order to enable the persons to act with conviction and commitment and playing an interventionist and catalytic role too for promoting national cohesion and unity by empowering the students to become agents of social change. Needless to observe that to properly assimilate and develop a realistic strategy for the realization of these stipulated goals and

roles of education, a true interdisciplinary perspective will have to be evolved with the help of studies on Indian Philosophy, History and Culture, Democracy, Constitutional Framework, Economy, its constraints and possible thrust areas, plurality of Indian social order with its known disparities arising from regional, sectoral, cultural, economic, religious and gender characteristics.

The newly formed discipline of Sociology of Education, Anthropology of Education, Politics of Education, Economics of Education, History of Education, Management of Education and others with their distinctive approaches have evidently shown a curious concern for and interpreting the socio-educational reality in a wholesome way. The process of social change and its relationship with education, the issues connected with equalization of educational opportunities, the cultural and value frame of educational interactions, process and content, the political determinants of policies and programmes of education; the approaches and techniques of educational and manpower planning, relating education to productivity, employment and economic growth and developing education as investment, formulating unbiased estimates of historical forces shaping education in its national milieu; planning, organizing, controlling; monitoring and evaluating the various forms of teaching and learning systems, application of educational technology approach for bringing about the prespecified learning outcomes in the most expeditious, efficient and economical ways are the prime thrust areas of these disciplines.

Interdisciplinarity in Educational Research

Educational research because of the very nature of the discipline of Education has an interdisciplinary character which gets further accentuated by the concern for its application to the understanding, evaluation and explication of social reality at various levels of its conceptualization. The educational reality deriving from both formal and non - formal set up is primarily social, interactional and dynamic and as such, it is truly comprehended from the application of manifold theoretical approaches. In the past three decades, a systematic drive has been launched to emphasize the study and application of concepts relating to education in a patently interdisciplinary frame of reference.It may be interesting to observe that such a perspective than gained popularity in almost all Sciences including Social and Behavioural Sciences. They have made a tremendous headway regarding the increase in the accumulation of the fund of knowledge, techniques of data collection & analysis and evaluation strategies by augmenting support from several cognate disciplines. Such a collaboration has now assumed the form of a constantly evolving dynamic methodological approach in developing and extending the corpus of knowledge to their respective fields. In germane each

discipline, there is now manifestation of a level of interaction which ensures a desired degree of integration, assimilation and congruence of divergent sets of concepts, strategies and approaches.

Educational research has borrowed methodologies which were developed originally in the disciplines of the Behavioural and Social Science. Psychology traditionally has dominated educational research and continues to exert a strong influence. The research has valued methodologies used in their social sciences, such as sociological survey research, anthropological participation observation, historical and philosophical research. Some of these approaches are applied directly to education while other approaches are modified to study an educational problem. The use of different concepts and methodologies from various disciplines enriches and extends research-based knowledge in education. The researcher can study any topic with variety of methods. For example, any topic of Science Education can be studied by a survey of curriculum needs, an experiment comparing student achievements, an observation classrooms interaction etc. Each of these approaches adds to knowledge about Science Education. Thus, in an interdisciplinary field, all research methodologies are valued for their potential usefulness in developing knowledge.

Interdisciplinarity in various forms of Research viz. Fundamental, Applied and Action Research

In the planning and conducting educational research relating to crucial questions derived from these domains of enquiries, one must adopt three forms of research; Basic or Fundamental Research, Applied Research and Action Research. In the first form of research, the educational questions identified are of a. relatively abstract and theoretical nature. While in the second form of research, a systematic concern is shown for the application of concepts and, principles to the actual conditions of socio-educational reality. The third form of research addresses itself to the grass root level reality pertaining to teaching-learning processes and systems, their management and administration. The main concern here is with amelioration or improvement of the quality of decisions and actions in these domains and ensuring professional growth of the practitioners of education.

Fundamental/Basic Research: In this educational research, the issues examined are basically of theoretical nature. The main goal in this research is, therefore, theory building and its focus is on development and extension of the corpus of educational knowledge pertaining to formal and non-formal arrangements of education, teaching and learning, the processes and the content, the learner, the agents and dynamics of organization, management and evaluation. The educational knowledge is a wide term, and it encompasses all that occurs in

the name of teaching and learning in these contexts and also those who provide and benefit from these activities. It is worth mentioning in this regard that the current theories of education in general and that of teaching in particular are the outcome of a multiplicity of approaches-philosophical, psychological, sociological, anthropological and so on both in respect of their empirical as well as logical structures and frame of reference. Thus, the main constructs which become the basis of Fundamental Research form in education are conceptualised from multipronged strategic moves in a multidisciplinary or interdisciplinary frame facilitating development of new perspectives, approaches and impactful findings.

Applied Research: In this research form, the accent is on systematically exploring the possibilities of use and application of the educational truths, principles and generalizations to the specific educational situations. In such, research, both trans-disciplinary as well as intra and inter-disciplinary perspectives are adopted depending upon the pragmatic exigencies. Thus, most of the recent concepts in the areas of Teaching Behaviour, Classroom Interactional Strategy building, Educational Technology, Programmed Instructional Procedures, Cybernetic Monitoring, Computer Aided, or Computer assisted learning and teaching for example are the result of Applied Research endeavours planned and implemented with either trans-disciplinary or inter-disciplinary or both trans and interdisciplinary perspectives.

Action Research: In this research form the questions pertain to the most concrete educational reality context. The concern here is highly pragmatic. As Louis Cohen and Lawrence Manion (1980) rightly observe, Action Research is small scale intervention in the functioning of the real world and a close examination of the effects of such intervention". This research form is 'situational' in as much as it is concerned with diagnosing a problem in a specific context and attempting to solve it in that context; it is usually (though not inevitably) collaborative-teams of researchers and practitioners work together on a project; it is participatory - team members themselves take part directly or indirectly in implementing the research; it is self-evaluative modification which is continuously evaluated within the ongoing situation and the ultimate objective being to improve practice in some way or other. According to Blum, the use of Action Research in the Social Sciences including the discipline of Education, may be described in two stages: a diagnostic stage in which the problems are analysed and the action hypotheses are developed; and a therapeutic stage in which the hypotheses are tested by a consciously directed change experiment, preferably in typical socio-educational situations.

In the educational contexts the use of Action Research strategy has been stressed as a means of remedying problems diagnosed in specific situation, or of improving in some way a given set circumstances as a means of in-service training, thereby equipping the teacher with new skills and methods, sharpening his analytical powers and heightening his self-awareness as a means of injecting additional or innovatory approaches to teaching and learning into an ongoing system which normally inhibits innovative changes as a means of improving the normally poor communications between the practising teacher and the academic researcher, and of remedying the failure of traditional research to give clear prescriptions and finally as a means of providing a preferable alternative to the more subjective impressionistic approach to problem solving in the classroom "despite the fact that the strategy lacks the rigor of true scientific research" (Cohen and Manion, 1980).

Relationship Between Applied and Action Research

The common point between Applied and Action Research forms is that both follow scientific method but the former is 'concerned mainly with establishing relationships and testing theories and is quite rigorous in the application of the conditions of this method'. Accordingly the Applied Research form insists on studying a large number of cases; establishing as much control as possible over variables, precise sampling techniques; and a serious concern to generalise its findings to comparable situations. It does not claim to contribute directly to the solutions of problems. On the other hand, in the Action Research form, the scientific method is used much more loosely owing to its focus on finding out a solution to a specific problem in a specific situation. Here the emphasis is, not so much on obtaining generalisable scientific knowledge as on precise knowledge for a particular situation and purpose. It may be noted that as Action Research projects become more extensive in their coverage, the boundary between the two research forms become less easy to define.

It is apparent from the foregoing analysis that Action Research represents quite unmistakably a strategy for improving a given educational situation while the Applied Research is directed chiefly on putting to use the various principles and generalizations with an intent to explore the possibility of application in various educational contexts. Thus, both the research forms thrive on an interdisciplinary perspective as an integral to employment and wider usage of techniques, devices and tools for collection of facts or evidence, analysis and synthesis of results and problem solving in specific contexts of educational realities.

In all the above mentioned three forms of research, the interdisciplinary perspective is undoubtedly useful in respect of a safe arrival at truth, formulation

of reliable and valid generalizations and effective problem solving. It is probably from this angle that use of triangulation has become quite popular and acceptable as a strategy of educational research in the context of Fundamental, Applied and Action Research forms.

Conclusion

In the nutshell, it can be concluded that promoting interdisciplinarity in educational research and various forms of research will pave the way for advancing solutions of the complex issues and problems in a comprehensive and innovative manner. The research in the field of education pertaining to teaching, learning, assessment, multimedia approaches, educational testing, administration, planning and management, ICT and use of digital skills must be investigated from the interdisciplinary framework so that it leads to the creation of novel findings that would help in revolutionize the social development and transform higher education. In addition to this, when three forms of educational researchviz. Fundamental, Applied andAction Research are carried out the interdisciplinary approach then the production of knowledge or theory, testing of the theory and improvement in the work situation of the practitioner respectively takes place in a more comprehensive and multidimensional perspective which facilitates in building a strong base for promoting research culture. Thus, exploring and promoting interdisciplinary research in educational research and various forms of research will allow to effectively address the complex research problems by advancing innovative and meaningful solution. These forms complement each other, often blurring boundaries, and together enhance the overall quality and applicability of educational inquiry. As the educational landscape continues to evolve, embracing interdisciplinarity will be key to developing innovative solutions, advancing educational equity, and strengthening the research ecosystem in higher education institutions across the country.

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Analysis of the Relationship between School-Related Variables and Happiness among Male and Female Students

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Abstract

Happiness plays a crucial role in students' overall well-being and academic success. This study investigates the relationship between school-related variables—such as school infrastructure, school celebrations, and implementation of government schemes, academic performance, teacher-student relationships, peer interactions, and school location with happiness among male and female students. Using a descriptive survey approach, authors & collected survey data from middle-stage students to examine happiness concerning these variables. The study found that positive relationships with above mentioned school related variables, significantly contribute to student happiness. The findings highlight the importance of fostering a supportive and engaging school environment to promote student well-being and happiness.

Introduction

Happiness among students is a key indicator of their mental health, social adjustment, and academic success. Schools play a vital role in shaping students' emotional well-being through various factors including school infrastructure, school event celebration, and implementation of government schemes, Teacher support, peer interactions, and school locations. Previous researches have shown that students who experience a positive school environment tend to be more motivated and perform better academically. However, the extent to which different school-related variables influence happiness among male and female students remains a topic of debate. Happiness is a very subjective and individualistic variable and is nurtured by multiple approaches, although caring during infancy and childhood is very important. “Happiness is often used as a term of subjective well-being in psychology” (Lyubomirsky et al., 2005a). The factors influencing students' happiness are learning skills, attitude, and knowledge can lead to satisfaction towards the happiness of learning among the students (Somtop, K., 2014).

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Research Problem

There are limited researches that explores the relationship between school-related variables and happiness while considering gender differences. Understanding these relationships can help educators and policymakers develop strategies to create a more positive school experience for all students.

The present study is planned to find out the relationship between school related variables and happiness.

Objectives of the Study

This study aims to:

* Identify key school-related factors that influence students' happiness.
* Analyse differences in happiness levels between male and female students.
* Examine the impact of school infrastructure, school celebration, and implementation of government schemes, academic performance, teacher-student relationships, peer interactions, and extracurricular activities on happiness.

Review of the related literature

Happiness and Education

Happiness is associated with positive emotions, life satisfaction, and well-being. In the context of education, happier students tend to exhibit better academic performance, higher motivation, and greater resilience. Studies suggest that students' happiness is influenced by their relationships with teachers and peers, academic experiences, and engagement in school activities.

School-Related Variables Affecting Happiness

Mertoglu (2020) investigated the factors which affect the children's levels of happiness Enjoying in going to school, good school environment, quality peer relationship, fun moment, higher self-esteem, feeling of safety in school context contributes positively student's levels of happiness. The things that make students happy mainly are "Enjoying being with other people", "Having self- confidence", “Having fun”, "Feeling school is a safe place".

Ramaswamy (2023) conducted a study to identify the factors which influenced students' happiness. Result showed strong relationships with family, friends, peers, school staff and teachers and is highly associated with academic achievements, involvement in extra- curricular activities, personal achievement and awards and feeling of school as a safe place for them and utilizing the school facilities and convenience.

Gender differences in happiness have been observed in various studies, with some suggesting that female students experience higher academic stress but greater emotional support from peers, while male students benefit more from extracurricular activities. These differences highlight the need for gender-sensitive educational approaches.

Methodology

Research Design

This study employed a descriptive survey approach, having quantitative surveys to gain a comprehensive understanding of students' happiness and its relationship with school-related variables.

Population

In this present study the students studying in class 6th, 7th, and 8th standard from Upper Primary Schools of Basic Shiksha Parishad of Ballia district of Uttar Pradesh have been taken as population for comprehensive study.

Sampling Technique

The study surveyed 500 students (250 male, 250 female) from different schools. Participants were selected through multi-stage random sampling to ensure diversity in academic performance, socioeconomic background, school type, and locale.

Tools used for the Study

The happiness of students was measured through the Student Happiness Scale. It is a 5-point Likert's rating scale. The Reliability of the Happiness Scale (tool) by Cronbach's alpha method was found to be 0.973, and by the split-half method was found to be 0.944. The validity of the Student Happiness Scale was established by item analysis (t-test) and consulting expertise from different disciplines.

Data Collection Methods

Survey Questionnaire – A structured questionnaire was used to assess students' happiness levels and their perceptions of school infrastructure, school celebration, and implementation of government schemes, teacher-student relationships, and peer interactions.

Data Analysis

Quantitative data were analysed using statistical tools such as percentage analysis and t-tests to test the null hypothesis.

Table 01 Comparative analysis of happiness of male students and female students towards school related variables

Gender	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Male students	4323 (27.45%)	10731 (68.13%)	549 (3.49%)	114 (0.72%)	33(0.21%)
Female students	6328 (40.18%)	9192 (58.36%)	223 (1.42%)	5(0.032%)	0
Total	10652 (33.82%)	19923 (63.25%)	772 (2.45%)	119 (0.376%)	33(0.21%)

The above analysis of given table shows that there is a minor difference between the attitude of male students and female students about the school related variables towards happiness. Most of the male and female students about (97.00%) are agreed that appropriate and good school related variables make them happy.

Table 02 Mean, SD, and t-value of student's happiness and its six dimensions between male students and female students. (N= 250 for male students and N= 250 for female students)

Variable	Male Students		Female Students		t-value
	N	Mean (SD)	N	Mean (S.D)	
School Infrastructure	250	62.34 (5.06)	250	65.36 (5.50)	6.95**
School Events	250	38.50 (3.36)	250	39.76 (3.05)	4.36**
Implementation of government scheme	250	34.15 (3.15)	250	35.21 (2.62)	4.05**
Peer relationship	250	29.58 (2.75)	250	30.33 (2.32)	3.28**
Teachers Support	250	80.02 (7.04)	250	83.32 (6.07)	5.60**
School Location	250	21.06 (2.23)	250	22.18 (1.88)	6.04**
Overall Student happiness	250	265.67 (21.07)	250	276.39 (18.83)	5.97**

***Significant at the 0.01 level*
**Significant at the 0.05 level*

An observation of table reveals that the male students (M = 265.67, SD = 21.07) had lower happiness score than female students (M = 276.39, SD = 18.83), and the difference was significant (t= 5.97, df = 498; p <0.01). Analysis also shows that male students (M = 62.34, SD = 5.06) have less happiness score towards school infrastructure than female students (M = 65.36, SD = 5.50), and difference was significant (t = 6.95, df = 498, p < 0.01). Further, analysis showed that towards the organization of school events in which on different activities and participation the students of male (M = 38.50, SD = 3.36) have low happiness score than female students (M = 39.76, SD = 3.05), and difference was significant (t = 4.36, df = 498, p < 0.01). The analysis also reveals that the male students have low happiness score towards the implementation of different government schemes which are beneficial for them (M = 34.15, SD = 3.15), than female students (M = 35.21, SD = 2.62), and the difference was significant (t = 4.05, df = 498, p<0.01). Further, analysis showed that on the dimension of peer relationships the male students have lesser happiness score (M = 29.58, SD = 2.75) than the female students (M = 30.33, SD = 2.32), and the difference was significant (t = 3.28, df = 498, p<0.01). The analysis also reveals that male students (M = 80.02, SD = 7.04) had low score towards teacher's supports, behavior and activities than the female students (M = 83.32, SD = 6.07), and difference was significant (t = 5.60, df = 498, p<0.01). Further, analysis showed that the male students have low happiness score towards the school location and environment (M = 21.06, SD = 2.23) than the female students (M = 22.18, SD =1.88), and difference was significant (t = 6.04, df = 498, p < 0.01).

Findings

The null hypothesis was rejected as a significant difference was observed (t = 5.97, df = 498, p < 0.01) between male students' happiness and female students' happiness. A significant difference was observed in the happiness of students in relation to their gender. The value of t is 5.97, and the p-value is 0.01, which is lower than the 0.05 and 0.01 levels of significance. Thus, the result showed that female students are happier than male students.

School Infrastructure

The null hypothesis was rejected as a significant difference was observed between the happiness of male and female students (t = 6.95, df = 498, p < 0.01). Thus, the result showed that male students are less happy than female students regarding school infrastructure.

School Event Organization

The null hypothesis was rejected as a significant difference was observed between the happiness of male and female students ($t = 4.36$, $df = 498$, $p < 0.01$). Thus, the result showed that male students are less happy than female students regarding school event organization.

Implementation of Government Schemes

The null hypothesis was rejected as a significant difference was observed between the happiness of male and female students ($t = 4.05$, $df = 498$, $p < 0.01$). Thus, the result showed that male students are less happy than female students regarding the implementation of government schemes.

Peer Relationships

The null hypothesis was rejected as a significant difference was observed between the happiness of male and female students ($t = 3.28$, $df = 498$, $p < 0.01$). Thus, the result showed that male students are less happy than female students regarding peer relationships.

Teacher's Support

The null hypothesis was rejected as a significant difference was observed between the happiness of male and female students ($t = 5.60$, $df = 498$, $p < 0.01$). Thus, the result showed that male students are less happy than female students regarding teacher's support.

School Location

The null hypothesis was rejected as a significant difference was observed between the happiness of male and female students ($t = 6.04$, $df = 498$, $p < 0.01$). Thus, the result showed that male students are less happy than female students regarding school location.

Results and Discussion

The survey results showed that 68% of students reported being happy in school, while 32% expressed moderate to low happiness levels. Female students reported slightly higher happiness levels than male students, though the difference was not statistically significant.

Conclusion

According to the present study, there is a significant difference between the happiness of male students and female students. The female students are happier

than male. The female students are more sensitive towards infrastructures facilities in comparisons to male students and the significant difference found towards infrastructural facilities. Further study showed that the female students are more creatively participate in different school event/ celebrations/ programs. So, female students are happier towards these events and programs.The female students have more positive attitude towards implementation of government schemes. So, female students showed more happiness than male students and significant difference is found there. Female students are more sensitive, cooperative and careful towards peer relationships than male students. The female students have more trust, creatively interact, concentrate on learning and have affectionate relationship with their teachers. The female students want more safe and easy accessibility to school and location near to home, safe place, environment and in safety reach/ transportable.

Implications of the Study

- Happiness is an important determinant as it is related with the comfort, necessary convenience and well-being of school student. Present research will be important for school administrators and policymakers to facilitate the teaching learning conditions in school to increase student's happiness and performance.
- School experiences are significant in student's life and present research establishes the empirical evidence towards basic need satisfaction, importance of self-expression, peer relationships, teacher's relationships and environments with happiness of students.
- The findings of present research work will make strong ground for educational stakeholders to understand the dynamics of students' happiness in school.
- In present study majority of the students showed happiness. School infrastructures, school events, implementation of government schemes, peer relationships, teacher's support and school locations and environments significantly affect their happiness rather than their habitat. Thus, teachers should encourage the students to participate and engage in different learning and developmental activities.
- This study helps to understand the importance of happiness in student's learning and all-round development. It awares and suggests to the

educational stakeholders like policy makers, administrator, managers, principals and teachers to maintain above given provisions in elementary schools.

- The teachers should encourage cooperative, collaborative, participatory teaching methods to facilitate strong peer relationships among students.
- The present study suggests that teacher-student relationship is an indicator of happiness. So, the teachers should be supportive, democratic, cooperative, affectionate and self-disciplinary behavior should be encouraged in the classroom. The teachers should try to establish strong teacher-student relationship.
- Present study suggests that the teachers should sympathetically treats to students. They should be sound and objective while dealing students. Teachers should use student's language and dialect in personal and group interactions in classroom and outside.
- The present research makes the empirical ground for maintaining the healthy, pleasant and conducive learning environment in upper primary schools which is important for the development and learning of children.

Recommendation of the study

- There is an inevitable need for positive and creative efforts for the happiness of students in school, because happiness is directly linked to student learning achievement.
- Emphasis should be laid on the development and establishment of infrastructures in schools, because these things are linked to student satisfaction, well-being and happiness.
- Participation of students and community in various school festivals and events should be insured. This increases the students' engagement, self-confidence, positive relationships, work efficiency and happiness.
- A happiness curriculum should be developed and implemented for all classes in all schools.
- Various schemes run by the government for student welfare should be implemented well in the school. This increases the student satisfaction and happiness as well as student learning efficiency.

- The working system of the school should be designed in such a way that appropriate space is ensured for peer interaction/ relationships and students teacher interaction/ relationships.
- To develop positive teacher-student relationship and quality learning experience, the teachers should use student centric teaching methods as well as advance and updated and tailored form of pedagogy.
- Schools should be located in natural environment at easy accessible places. This increases regular attendance, as well as happiness of the students.

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The Role of Social Networks in Shaping Public Health Behavior during a Pandemic: A Comprehensive Review

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Abstract

The COVID-19 pandemic has underscored the critical role of social networks in shaping public health behavior, with individuals' social interactions significantly influencing their health decisions and adherence to public health guidelines. This review article explores the multifaceted role of social networks—both offline (e.g., family, friends, colleagues) and online (e.g., social media platforms)—in influencing health behaviors during pandemics. Social networks can act as both facilitators and barriers to the adoption of health measures such as physical distancing, mask-wearing, vaccination, and adherence to quarantine guidelines. By examining the mechanisms through which social networks exert their influence on public health behavior, this review aims to provide insights for public health practitioners and researchers to develop more effective strategies for pandemic response. The review also highlights the challenges associated with misinformation, echo chambers, and health disparities in social networks, and suggests ways in which digital and traditional networks can be leveraged to improve health outcomes in future pandemics.

1. Introduction

The COVID-19 pandemic, a global health crisis of unprecedented scale, has not only caused immense physical and emotional suffering worldwide but has also exposed critical vulnerabilities in public health systems, thereby highlighting the intricate connections between health behavior and social dynamics. As the world scrambled to control the spread of the virus, the pandemic underscored the importance of behavior change at the population level. The rapid spread of the virus demanded not just the development of medical interventions and technological tools but also required a deep understanding of how individuals make decisions regarding their health, which are often shaped by the social contexts in which they live. The crisis revealed that public health responses cannot rely solely on science, data, or technology; instead, they must consider the complex interplay of individual behavior, cultural norms, social influences, and

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information networks. These aspects form the crux of what could either facilitate or hinder efforts to control the pandemic and protect public health.

In this context, social networks—defined as the web of relationships among individuals, groups, and even online platforms—have proven to be central to shaping both the collective and individual responses to the crisis. These networks are far more than just a collection of people or digital connections; they are powerful channels through which information, ideas, norms, and behaviors spread, influencing everything from health risk perception to compliance with governmental directives. Social networks provide the structure within which individuals exchange knowledge, share experiences, and influence each other's decisions. During times of crisis, these networks become even more critical as they help people navigate uncertainty and make decisions about health behaviors. In fact, social networks can act as both facilitators and barriers to desired health behaviors, such as mask-wearing, vaccination uptake, and social distancing, depending on the norms and behaviors that prevail within them.

One of the key ways that social networks influence health behavior is by shaping individuals' risk perceptions. People's understanding of a health crisis is often colored by the information they receive from those within their social circles. When individuals receive consistent messages from their family, friends, or digital platforms about the severity of the pandemic or the effectiveness of preventive measures, it can significantly influence how seriously they take the risks involved. For example, individuals who are surrounded by people who view the pandemic as a serious threat are more likely to perceive COVID-19 as a significant risk and, consequently, adopt preventive behaviors such as physical distancing, mask-wearing, and frequent handwashing.

Social networks also have the power to promote or challenge public health practices. They can serve as powerful forces for socialization, either reinforcing positive behaviors, such as encouraging vaccination, or perpetuating negative behaviors, such as promoting skepticism towards public health measures. The strength of social ties within a network—whether strong, like that of close family members or friends, or weak, like acquaintances or distant online connections—determines how deeply these behaviors are adopted. For instance, close-knit social circles may exert stronger normative pressure to comply with health guidelines, while loose connections might have less influence. Furthermore, individuals are more likely to adopt behaviors they observe being practiced by those they trust and identify with. This mechanism is particularly

evident in the adoption of health practices like mask-wearing and the acceptance of vaccination, where individuals' decisions are influenced by what they see in their networks.

However, not all outcomes are positive. Social networks can also be channels for the dissemination of misinformation, which can be especially detrimental during a health crisis. The COVID-19 pandemic provided a stark illustration of this phenomenon, with misinformation about the virus, its spread, its severity, and its treatment circulating widely within social networks—both offline and online. Platforms such as Facebook, Twitter, and WhatsApp became breeding grounds for false claims, conspiracy theories, and misleading health advice, much of which was shared within individuals' personal networks. The spread of misinformation had a profound impact on the public's willingness to comply with public health measures. For example, misinformation about the safety of vaccines fueled vaccine hesitancy, while false claims about the effectiveness of certain treatments or prevention strategies contributed to confusion and non-compliance with scientifically proven practices like social distancing and mask-wearing (Vosoughi, Roy, & Aral, 2018). In some instances, misinformation has been more contagious than the virus itself, undermining the efforts of public health organizations and complicating the fight against the pandemic.

Furthermore, the pandemic highlighted the role of digital social networks in amplifying these effects. The rise of social media platforms as primary sources of information has transformed the way individuals interact with health messages. While these platforms have enabled rapid dissemination of official public health information, they have also allowed misinformation to spread at an alarming rate. In many cases, social media algorithms, which prioritize content that generates engagement, have inadvertently amplified sensational, misleading, or harmful information, further complicating efforts to curb misinformation. The echo chambers that develop within these platforms often reinforce individuals' pre-existing beliefs, making it difficult to correct misconceptions and promote healthier behaviors.

This article reviews the pivotal role that social networks play in shaping public health behavior during a pandemic, with a particular focus on the COVID-19 pandemic. It explores the various ways social networks influence individuals' decisions, the challenges posed by misinformation, and the opportunities for leveraging both traditional and digital networks to promote positive health behaviors. In doing so, it aims to shed light on the mechanisms through which

networks shape public health outcomes and provide insights into strategies that can be used to harness these networks for better health communication and response. Additionally, the review examines potential approaches for improving the effectiveness of public health interventions by addressing the limitations and challenges posed by misinformation, echo chambers, and social fragmentation within networks. The role of public health officials, digital platforms, and policymakers in managing the influence of social networks during a pandemic is critically analyzed, along with recommendations for future research on improving the nexus between social networks and health behavior in crisis situations.

2. Social Networks and Public Health Behavior

2.1. Social Networks and Health Behavior

Social networks can be defined as the patterns of relationships and interactions that exist between individuals, communities, and organizations. These relationships are not limited to face-to-face connections but include digital and virtual platforms, which have gained prominence in recent years (Christakis & Fowler, 2007). Social networks are important because they serve as conduits through which information and behaviors are transmitted. In the context of public health, these networks influence behaviors such as health risk perception, decision-making, and adherence to public health guidelines.

Health behaviors are often shaped by both direct and indirect influences from the people in an individual's social network. Direct influences include interactions with family, friends, and close peers, who can have a significant impact on attitudes toward health behaviors. Indirect influences include the broader societal and community networks that shape collective norms and behaviors (Valente, 2010). For example, during a pandemic, individuals may alter their behaviors based on information and practices observed within their social circles.

In the case of COVID-19, social networks played a critical role in disseminating both accurate and inaccurate information regarding the virus. Family members, friends, and colleagues shared their experiences, insights, and sometimes unverified claims about the pandemic. The extent to which individuals adhered to recommended health behaviors, such as wearing masks or getting vaccinated, was often influenced by the behaviors and attitudes prevalent within their immediate social networks (Berkman et al., 2000).

2.2. The Mechanisms of Social Influence in Health Behavior

Social influence theory provides a framework for understanding how behaviors

spread through social networks. This theory posits that individuals are influenced by those within their social networks to adopt behaviors, attitudes, or beliefs (Cohen, 2006). The mechanisms through which social influence operates include peer pressure, normative influence, informational influence, and emotional contagion (Betsch et al., 2012).

- Peer pressure refers to the direct influence exerted by peers to conform to certain behaviors or beliefs. During the COVID-19 pandemic, peer pressure may have influenced individuals to engage in protective behaviors, such as wearing masks, if they saw others in their network doing the same.
- Normative influence refers to the impact that social norms (i.e., the accepted behaviors in a community) have on individual behavior. When mask-wearing and physical distancing became widely accepted social norms in many regions, individuals were more likely to comply with these behaviors.
- Informational influence occurs when individuals seek information from others in their social network to make decisions about their own health. This is especially important in times of crisis when uncertainty prevails. People often turn to trusted members of their social networks for advice about how to navigate the pandemic.
- Emotional contagion describes the process by which emotions, particularly fear, anxiety, and panic, spread through social networks. During a pandemic, heightened emotions related to the threat of infection can lead to increased adherence to preventive measures or, conversely, to resistance if those emotions are fueled by misinformation or fear (Christakis & Fowler, 2007).

2.3. Social Networks and Risk Perception

Risk perception plays a central role in determining whether individuals adopt preventive health behaviors during a pandemic. According to the social amplification of risk framework, social networks can amplify or attenuate individuals' perceptions of risk, based on the information that circulates within these networks (Kasperson et al., 1988). Social networks can influence how individuals perceive the seriousness of the pandemic, which, in turn, affects their willingness to engage in preventive behaviors, such as social distancing or getting vaccinated.

In the COVID-19 pandemic, individuals' risk perception varied significantly based on the information they received through their social networks. For example, individuals in networks where the severity of COVID-19 was

downplayed or where misinformation circulated widely were less likely to perceive the virus as a significant threat, and therefore less likely to engage in protective behaviors. In contrast, individuals in networks where the pandemic was framed as an urgent, life-threatening crisis were more likely to adopt preventive measures (Jang, Lee, & Kim, 2020).

2.4. Social Support and Health Behavior

Social support plays an important role in shaping health behaviors, particularly during times of crisis. Social support refers to the emotional, informational, and practical assistance that individuals receive from their social networks (Berkman et al., 2000). In the context of a pandemic, social support can help individuals manage stress and anxiety, make informed decisions, and adhere to public health guidelines.

For example, during the COVID-19 pandemic, individuals who received emotional support from their families and friends were better able to cope with the stress associated with isolation and uncertainty. Moreover, social support within networks can reinforce desired behaviors, such as adherence to quarantine guidelines or following government recommendations (Betsch et al., 2012). Networks can provide practical support, such as delivering groceries to those in quarantine or offering assistance with childcare.

3. The Role of Digital Social Networks during a Pandemic

3.1. The Rise of Digital Social Networks

Digital social networks, such as Facebook, Twitter, Instagram, and WhatsApp, have become central to communication during the COVID-19 pandemic. These platforms have enabled individuals, communities, and health organizations to share information, provide emotional support, and engage in collective action to address the pandemic. Social media platforms have served as essential tools for public health communication, allowing authorities to disseminate guidelines, debunk misinformation, and interact with the public in real-time.

Research has shown that digital networks can be highly effective in shaping health behaviors during a pandemic. For instance, public health campaigns conducted through social media have been successful in promoting mask-wearing, social distancing, and vaccination, especially when these messages are reinforced by peer groups within digital networks (Meyerowitz-Katz et al., 2020).

3.2. The Spread of Misinformation in Digital Networks

Despite the benefits of digital networks, they also present challenges, particularly in the form of **misinformation**. The rapid spread of misinformation on platforms

like Facebook and Twitter has posed significant challenges for public health responses during the COVID-19 pandemic. False information about the virus, such as claims about its origin, treatment, and transmission, has been disseminated widely, often with dire consequences for public health efforts.

Studies have shown that misinformation spreads more quickly than accurate information on social media (Vosoughi et al., 2018). The viral nature of content, coupled with the ability to target specific audiences through algorithms, creates an environment where false information can reach large segments of the population, influencing their health decisions and behaviors. During the COVID-19 pandemic, misinformation about vaccines, in particular, has led to vaccine hesitancy and lower vaccination rates in certain communities (Lewandowsky et al., 2017).

3.3. Echo Chambers and Polarization

Digital social networks can also contribute to the formation of **echo chambers,** where individuals are exposed primarily to information that reinforces their pre-existing beliefs. In the context of public health, echo chambers can exacerbate polarization, with different groups forming opposing views on issues like mask-wearing or vaccination. This polarization can undermine public health efforts and hinder collective action.

Social media platforms, by design, often promote content that generates engagement, which can lead to the amplification of sensational or extreme viewpoints. As a result, individuals in echo chambers may become increasingly resistant to public health messages that do not align with their beliefs, making it more difficult to achieve consensus on important health behaviors during a pandemic (Friggeri et al., 2014).

4. Challenges and Opportunities

4.1. Health Inequities and Social Fragmentation

While social networks can be powerful tools for shaping health behavior, they also reflect and perpetuate social inequities. People from marginalized communities may have less access to supportive social networks, particularly in digital spaces, where access to technology and digital literacy can vary significantly. Health disparities, such as lower socioeconomic status, lack of education, and geographic isolation, can hinder individuals' ability to access reliable information and engage in health-promoting behaviors during a pandemic.

These disparities are compounded by the spread of misinformation, which

disproportionately affects vulnerable populations. Addressing these inequities requires targeted interventions that take into account the unique needs and challenges of marginalized communities (Vidal et al., 2020).

4.2. Leveraging Social Networks for Public Health Communication

Given the central role of social networks in shaping public health behavior, public health agencies should focus on leveraging these networks to promote health behaviors and counter misinformation. This can be achieved by building partnerships with trusted influencers, community leaders, and social media personalities to disseminate accurate information and encourage positive behaviors. Additionally, fostering collaboration between digital platforms, health organizations, and policymakers can help create more effective communication strategies during future pandemics.

Public health interventions should also be tailored to the specific needs of different social networks, recognizing the diverse ways in which people interact with health information. Engaging with both offline and online networks can provide a more holistic approach to pandemic management and ensure that health messages reach a broad audience.

5. Conclusion

Social networks play a pivotal role in shaping public health behavior during a pandemic. They can facilitate the adoption of preventive behaviors, such as wearing masks, social distancing, and getting vaccinated, by influencing individuals' attitudes, perceptions, and decisions. However, social networks can also contribute to the spread of misinformation and exacerbate health disparities, creating challenges for public health efforts. Understanding the dynamics of social networks and their impact on public health behavior is crucial for designing effective public health interventions. Future research should focus on exploring the intersection of social networks, digital media, and health behavior to improve public health communication and response strategies during pandemics.

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Effect of Pentachlorophenol on Testicular Steroidogenesis during Different Reproductive Phases of the Catfish, *Heteropneustes fossilis*

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Abstract

Endocrine disruptor chemical may result in decline of fish population and affect other animals and human beings after entering into food chain. This study is important in order to generate baseline data for its toxicity in fish and to make an inference needed to evaluate the toxic potency of Pentachlorophenol (PCP). During pre-spawning phase, testes of PCP exposed group (32 µg/l/day for 28 days) showed a decreased in the values of testosterone while an increase in the E2 level was observed which indicates estrogenic potential of PCP whereas, in spawning phase, testes of PCP exposed group showed a significant increase in the testosterone level and decrease in the E2 level. Increase in Estradiol level was found in testes of exposed fish during pre-spawning phase might be due to the effect of PCP as endocrine disruptor and estrogenic as well. Increase in Testosterone level during spawning phase could be due to increased spermatogenesis during this phase. Study with dose and duration dependent exposure may explain further understanding.

Introduction

Pentachlorophenol (PCP) was extensively used for decades in agriculture and industry Zheng et al., 2012). It is an organic chlorinated compound used worldwide for preserving utility poles, railroad, and as insecticides, pesticides, and biocides for controlling agricultural and household pests (Cooper and Jones, 2008). Deleterious effects of PCP such as developmental toxicity, liver defects, genetic toxicity, and endocrine disrupting activity have been studied in livestocks (Morales et al., 2014). The pollution of PCP may pose a severe threat to the survival of aquatic species, and it is crucial to analyze its ecological risk. The adverse effects of PCP have been reported by many workers which included immunotoxicity, carcinogenicity, oxidative stress and metabolic disorders Chen et al., 2015). The PCP has been demonstrated to display estrogenic, anti-estrogenic and anti-androgenic in vitro

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Orton et al., 2009; and disturbance in the hypothalamic-pituitary-gonadal (HPG) axis in vivo study Zhang et al., 2008). The proteins in HPG axis often showed inconsistent values in response to the change of time and concentration of exogenous toxicant Liu et al., 2009). There are studies lacking on the distribution of steroid hormones which play important role in regulating reproductive status and spawning behavior (Bruton, 1996). The PCP has been reported to cause DNA damage, endocrine disruption (Zhang et al., 2014), impairments of ovaries, follicular atresia (Sawle et al., 2010), morphological deformities (Cheng et al., 2015), altered activities of antioxidant enzymes, changes in serum testosterone (Zhang et al., 2014), anti-estrogenicity (Zhao et al., 2006), reproductive organ damage (Zhang et al., 2014), immunotoxicity (Shelley et al., 2009) and mutation (Yin et al., 2009) in fish species. Many endocrine disruptors inhibit and/or induce sex steroid biosynthesis consequently linked to reproductive abnormalities in animals Reeder et al., 2005). Testicular steroids can induce spermiation and certain steroid glucuronides function as sex pheromones implying importance in breeding and captive reproduction (Chaube, et al 2018). Fish is used widely as a bio-indicator of water pollution due to rapid responses with high sensitivity to changes in their usual physiological functions such as molecular, biochemical, cellular, hormonal, or behavioral responses (van der Oost et al., 2003). The freshwater catfish, *H. fossilis* is an edible, economically important fish,

and is ideal for wastewater aquaculture. The present study will be useful in understanding the impact of PCP on metabolic and reproductive functions encountered by freshwater fishes. Steroids are chief hormonal messengers synthesized mainly by gonads and play key role in sexual differentiation, metabolism, osmoregulation and germ cell growth, maturation and release, these are degraded largely in the liver to form water soluble metabolites, which are excreted out (Chaube, et al., 2018). The objective of this study was to investigate possible impact of PCP on steroid profile of testes of the catfish, *H. fossilis*. The present analysis can provide valuable insights with regard to the functions of the steroids in the male fish exposed to the PCP.

Materials and Methods

Chemicals

PCP (Crystalline, 99% pure) was purchased from Acros Organics (Geel, Belgium). All other chemicals were of analytical grade and purchased locally. The PCP was dissolved in ethanol and then diluted with water to obtain the required concentrations 32 µg/l (1/10th of LC_{50}).

Animal collection and maintenance

The experiments were performed in accordance with local/national guidelines for experimentation in animals and all care was taken to prevent cruelty of any kind. The freshwater catfish *H. fossilis* were purchased from the local market in Varanasi and used for the experiment. They were acclimated to laboratory conditions for one week prior to the experiments. They were maintained in the laboratory under normal photo period (13.0L:11.0D) and temperature (25±2^{0}C) until use for experiments. The fish were fed with boiled egg daily *ad libitum.*

Experimental setup

The acclimatized adult male fish classified into two groups (15 fish per each): first group control, second group PCP treated (28 days with 32 µg/l/day) in pre-spawning and spawning phase. In the present study, the amount of PCP exposures was 32 µg/l and the exposure concentrations were determined by performing LC_{50} experiment Dubey and Verma, 2019, 2021; Dubey et. al., 2022). The conditions of the experiment were as that of acclimatization with changing all the containers water and concentrations of PCP every day.

Steroid extraction

The tissues were homogenized separately in 4 volume cold PBS (0.02 M, phosphate buffered-saline pH 7.4) with an ultrasonic homogenizer at 0^{0}C for 5–10 seconds. The homogenate was centrifuged at 5000 rpm for 20 min at 4^{0}C and extracted with 3 volume diethyl ether, three times. The ether phase was pooled, evaporated and dried under N_2 gas, and stored at -20^{0}C. The incubation medium was directly extracted with diethyl-ether, as described above. The ether phase was pooled group-wise, evaporated, dried under N_2 and stored at -20^{0}C. For the hormone assay, both tissue supernatant and corresponding incubation medium were pooled to make a sample.The supernatant was collected and steroid extracted in 3 volume diethyl ether, 3 times. Organic fractions were pooled, evaporated and dried under N_2 gas and stored at -20°C till further

estimation. Prepared the extracted steroid in solution form by adding 100 µl methanol to steroid extract.

A. Testosterone assay

Testosterone was assayed using an ELISA kit according to the manufacturer's instructions. Briefly, 25 µl each of standard (0, 20, 100, 400 and 1600 pg/ml) and samples were pipetted into the anti-TIgG-coated plate well. The immunoreaction was started by adding100 µl of T-HRP conjugate solution to each well, followed by incubation at 37^{0}C for 1 hour. The content from each plate was removed and washed with 300 µl of distilled water, 5–6 times. Water was completely drained out from each

well. Next 100 µl of 3, 3', 5, 5'-tetramethylbenzidine (TMB) substrate was dispensed into each well and incubated at 25^{0}C for 15 min in dark. Color development was stopped by adding 100 µl of stop solution (0.15 M, sulphuric acid). Absorbance was taken at 450 nm using a Multiscan microplate reader (Thermo Electron Corporation, USA).

B. Estradiol-17β (E2) assay

E2 was assayed using an ELISA kit according to the manufacturer's instructions. Briefly, 25 µl each of standard (0, 20, 120, 300, 600 and 2000 pg/ml) and samples were dispensed into the anti-E2-IgG-coated plate well. The immunoreaction was started by adding 200 µl of E2-HRP conjugate solution to each well, followed by incubation at 37^{0}C for 2 hour. The content from each plate was removed and washed with 300 µl of distilled water, 5–6 times. Water was completely drained out from each well. Next 100 µl of 3, 3', 5, 5'-tetramethyl benzidine substrate was dispensed into each well and incubated at 25^{0}C for 30 min in dark. Color development was stopped by adding 100 µl of stop solution (0.15 M, sulphuric acid). Absorbance was taken at 450 nm using a Multiscan microplate reader (Thermo Electron Corporation, USA).

Statistical Analysis

The data were expressed as means ± standard error mean (SEM). Comparisons of means (control and treated fish) were done by Student's t-test. The result was considered significant at 5% level ($p < 0.05$).

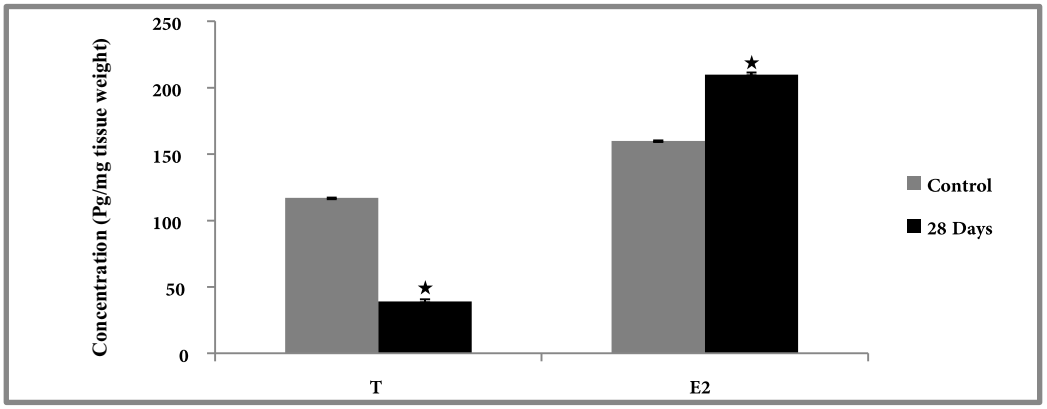

Fig. 1: Estimation of Testosterone (T) and estradiol-17β (E2) in the testes of the catfish *H. fossilis* exposed to 32µg/l/ day PCP for 28 days during the pre-spawning phase of reproduction. (Asterisk shows significant difference from Control at P<0.05; Student's t-Test) Data were expressed as mean ± SEM

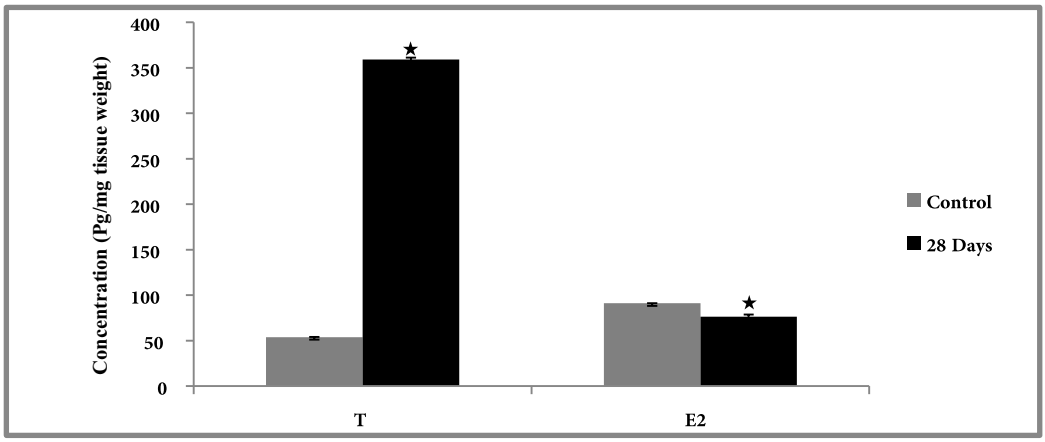

Fig. 2: Estimation of Testosterone (T) and estradiol-17β (E2) in the testes of the catfish *H. fossilis* exposed to 32µg/l/ day PCP for 28 days during the spawning phase of reproduction. (Asterisk shows significant difference from Control at P<0.05; Student's t-Test). Data were expressed as mean ± SEM.

Results

During pre-spawning phase, testes of PCP exposed group (28 days with 32 µg/l/day) showed a decrease in the values of testosterone while an increase in the E2 level was observed. In spawning phase, testes of PCP exposed group (28 days with 32 µg/l/day) showed a significant increase in the testosterone level while decrease in the E2 level was observed.

Discussion

Amongst vertebrates, fishes are the most at the risk of endocrine disruption since their habitat receives the greatest input of pollutants due to anthropogenic activities or natural weathering processes. Fishes are, therefore, considered the most suitable animal model in endocrine disruption-related research. To date most of the studies elucidating toxicity of xenobiotics on fishes focus on two of the major endocrine axes, the stress and reproductive (Hontela, 1998). It is reported that sex steroids are synthesized in the brain, renal and gonadal tissue of teleosts (Petersen et al., 2015). Further in studies it is revealed that androgen biosynthesis is under the control of the HPG axis which perceives endogenous and environmental cues to modulate sex steroid synthesis from cholesterol (Miller and Bose, 2011). Steroidogenesis produces the estrogen, E2, and the androgen (Carnevali et al., 2018). The steroidogenic pathway is highly conserved across vertebrate taxa and is a major target of endocrine disruption (Feswick et al., 2014). Initial spermatogenesis is under FSH control, while later spermiogenic stages are regulated by pituitary LH (Itoh et al., 1988). Some studies relate reproductive cycle in adult fish with fluctuating levels of androgen synthesis

(Weltzien et al., 2002). Seasonality was reported in plasma testosterone levels (Borg,

1994) and is directly correlated to spermatogenesis (Rinchard et al., 2001). During late spermatogenesis, a reduction in testosterone is attributed to a shift in the steroidogenic pathway towards 17,20β-P or similar Mullerian inhibiting hormone (MIH) production (Yaron and Levavi-Sivan, 2011). Androgens also have roles in lipid transport and oxidation (Hoffman et al., 2008), β lymphocyte differentiation (Moens, et al., 2007), xenobiotic clearance (Martyniuk and Denslow, 2012) and protein metabolism (Dorts et al., 2009). Androgens also regulate endothelial function, inflammation and oxidative stress in fishes (Si et al., 2014), although the specific mechanisms through which they accomplish this, is currently unknown.

Several xenobiotic compounds that are reported to disrupt various physiological activities fall in the list of endocrine-disrupting chemicals since minute alteration in hormone levels, their receptors or post-receptor signals can cause significant changes in the functions of target cells and tissues (Colborn et al., 1993).

The PCP is highly persistent with the potential to modulate several biological processes that have an impact on growth and development. It is often detected in the aquatic environment (Crosby et al., 1981). Wu et al (2001) showed that in channel catfish testes, estrogens, participate in the regulation of male gamete development and fertility. In vertebrates ranging from sharks to mammals, testicular tissues have been shown to contain aromatase, the rate-limiting enzyme for estrogen formation (Gist et al., 2007).

In the present study testosterone levels was high in control group in pre spawning phase which was expected. Similar findings state that androgen levels are high moderately during the initiation of spermatogenesis (Rolland et al., 2009). Androgens of the testes increased during spermatogenesis and spermiation and play significant role in male reproduction (Amer et al., 2001).

Two androgen receptor (AR) subtypes (α and β) have been demonstrated in fish and they are all predominantly expressed in the gonad particularly expressed in sertoli and interstitial cells (Ikeuchi et al., 2001) suggesting that androgens develop biological activity via the testicular somatic cells. Similarly, the investigation also showed high levels of 17, 20β –DP in testes, levels being higher in pre spawning phase in testes than spawning phase. Baynes and Scott (1985) proposed that a major function of 17, 20β-DP in the male is to control sperm motility mediated by changes in K+ composition of seminal fluid. Another function of 17, 20β –DP is that it can be conjugated into glucuronide and conjugates and these water soluble conjugates have pheromonal role (Ikeuchi et al., 2001). In the catfish 17, 20β–DP may be involved in sperm maturation and spermiation and role in pheromone is a field to be investigated further. Steroid levels are generally low during the non-reproductive period, but increase gradually throughout gametogenesis and decline abruptly thereafter. The predominance of T, 11-

ketotestosterone (11-KT) and E2 in initiating and regulating seasonal reproductive events are most intensively studied (Zhou et al., 2007).

In catfish *H. fossilis* high E2 in testes in spawning phase was observed. Regarding the functional role of E2, it may promote or inhibit early spermatogonia renewal.

Song and Gutzeit, 2003). The E2 may regulate the regulation of the steroidogenesis (i.e. Star, 3β-HSD, aromatase A and B). Administration of E2 to maturing sea bream males resulted in the identification of numerous estrogen-dependent genes in the testes (Patino et al., 2006).

In spawning phase, testes of PCP exposed fish showed a significant increase in the testosterone level while a decrease in the E2 level. Increase in testosterone level during spawning phase might be due to increased spermatogenesis during this phase. Study with dose and duration dependent exposure is needed for its further understanding.

Endocrine disruption by PCP was monitored in adult zebrafish and rare minnow (*Gobiocypris rarus*) with elevated plasma thyroxine concentrations (Zha et al., 2007). Many synthetic chemicals have been shown to function as natural steroid hormones since they can interact with the estrogen receptor (ER) as agonists and elicit biological responses (Jin et al., 2012). For example, these endocrine disrupters can bind to ERα or ERβ and subsequently alter the normal expression of estrogen-responsive genes (Verderame et al., 2011). In zebrafish and rare minnow, the estrogen receptor (ER) mRNA was up-regulated in males and down-regulated in females, and vitellogenin mRNA induction and serum vitellogenin protein increase was reported in longer exposed females (Zhang et al., 2014). During pre-spawning phase, testes of PCP exposed *H. fossilis* showed a decrease in the values of testosterone and increase in estradiol level, could be due to the effect of PCP as endocrine disruptor and its estrogenic potential as well.

Conclusion

At present time, surface waters are polluting by various ways. Elevated levels of pollutants in aquatic systems have resulted from a number of activities including agriculture, urbanization, impoundments, mining and industrial activities. These effects reduced growth rates, impaired reproduction and sometimes death. Bioaccumulation and bio concentration of these in the food chain can put consumers, including humans at risk. PCP is an organic chlorinated compound used worldwide for preserving utility poles, railroad, and as insecticides, pesticides, and biocides for controlling agricultural and household pests (Cooper and Jones, 2008). During pre-spawning phase, testes of PCP exposed fish showed a decreased in the values of testosterone while an increase in the E2 level was observed which indicates estrogenic potential of PCP. In spawning phase, testes of PCP exposed group showed a significant increase in the testosterone level while decrease in the E2 level. The pollution of PCP

may pose a severe threat to the survival of aquatic species due to its endocrine disruptive activity.

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Impact of Globalization on Women's Health and Reproductive Rights

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Abstract

Globalization has led to significant changes in various aspects of the global landscape, affecting social, political, economic, and cultural domains. One of the key areas where globalization has had a considerable impact is in women's health and reproductive rights. This research review critically explores the various dimensions of how globalization has shaped women's access to health services, reproductive rights, and gender equality in health. The review evaluates both positive and negative consequences of globalization in the context of women's health, drawing on examples from various regions and countries. The paper outlines the role of international organizations, policies, global networks, and market-driven healthcare systems in influencing women's reproductive health. Finally, the review highlights the emerging challenges that globalization poses for women, including health inequalities, commercialization of health services, and the erosion of reproductive rights, particularly in the global south.

Introduction

Globalization, as a multidimensional phenomenon, refers to the increasing interconnectedness and interdependence of countries, economies, and cultures through advancements in technology, communication, and trade. While globalization has facilitated economic growth, cultural exchange, and the spread of technological innovations, its impact on various aspects of human life, particularly on women's health and reproductive rights, remains a complex and controversial issue. Women's health, especially reproductive health, is an area where the effects of globalization are particularly evident, both positively and negatively. Access to healthcare, reproductive rights, maternal health, and education around sexual and reproductive health have been significantly influenced by global policies, international organizations, and market forces (Buse & Harmer, 2004). These changes, however, have not been uniformly beneficial and have often exposed existing inequalities, particularly in low- and

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middle-income countries.

The concept of reproductive rights is central to understanding how globalization influences women's health. Reproductive rights encompass a broad range of rights related to sexual and reproductive health, including the right to access family planning, contraception, maternal care, safe abortion, and sex education (Solinger, 2018). Historically, the struggle for reproductive rights has been tied to broader gender equality movements, and globalization has provided both opportunities and challenges in this regard. On the one hand, international frameworks such as the International Conference on Population and Development (ICPD) and the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) have advocated for women's reproductive autonomy and access to services (United Nations, 1995). On the other hand, globalization has also fueled conservative political movements and market-driven healthcare systems that often restrict reproductive rights, especially in developing regions (Solinger, 2018).

Globalization's influence on women's health is also seen in the expansion of healthcare access and technologies. The spread of digital technologies, social media, and mobile health (mHealth) applications has facilitated greater access to health information and services for women in remote areas. In many instances, these advancements have allowed women to gain knowledge about their health rights and reproductive options, contributing to improved health outcomes (Benson, 2008). For instance, international organizations like the World Health Organization (WHO) and the United Nations Population Fund (UNFPA) have launched campaigns that help disseminate information about maternal health and contraception globally, thereby contributing to the improvement of reproductive health in marginalized communities (UNFPA, 2021). However, globalization has also perpetuated inequalities, with women in low-income countries often facing significant barriers to accessing these benefits. The commercialization of healthcare, privatization of services, and reliance on international aid have resulted in uneven access to quality health services, often leaving the most vulnerable women behind (Basu, 2018).

In this review, the impacts of globalization on women's health, particularly reproductive rights, will be explored through a critical lens. While some argue that globalization has fostered advancements in women's health through increased access to healthcare resources and reproductive rights, others contend that the process has deepened existing health disparities, especially in regions where the commercialization of health services and conservative policies undermine women's autonomy. By examining both the positive and negative

effects of globalization, this review aims to provide a comprehensive understanding of how global forces shape the health and reproductive rights of women worldwide.

Globalization and Women's Health Access

Globalization has fundamentally altered the way healthcare is organized and delivered. Advances in communication technologies, international trade, and global networks have increased the accessibility of health services and information across national borders. For example, the proliferation of the internet and mobile technology has allowed women in remote areas of the world to access health information that was previously inaccessible to them. Additionally, global health initiatives, driven by international organizations, have played a significant role in improving health outcomes for women, particularly in low- and middle-income countries.

Positive Effects: Increased Access to Health Information

One of the most notable impacts of globalization on women's health is the increased accessibility to health information. With the widespread use of the internet and mobile phones, women now have greater access to information about reproductive health, family planning, and maternal care. The availability of online resources has empowered women to make more informed decisions about their health. International health organizations such as the WHO and the United Nations Population Fund (UNFPA) have launched online campaigns and websites to disseminate important health information to women globally. For instance, initiatives like "Family Planning 2020" have aimed to increase access to family planning services, providing women with the tools they need to make choices regarding their reproductive health (UNFPA, 2021).

Furthermore, social media platforms have allowed women to form global networks, exchange knowledge, and share experiences about their health. This has led to the emergence of online communities that advocate for women's health and reproductive rights, particularly in countries where such discussions were previously restricted. These platforms have also provided a space for women to engage in activism, address reproductive health issues, and share their personal stories of reproductive health challenges, creating a collective force for change.

Negative Effects: The Commercialization of Healthcare

While globalization has brought benefits in terms of access to information, it has also had detrimental effects, particularly with the increasing commercialization of healthcare. In many countries, the rise of private healthcare providers has led to

a system in which profit is prioritized over patient care. The privatization of healthcare has often resulted in inequities, where women in low-income or rural areas struggle to access essential health services due to high costs.

In countries with market-driven healthcare systems, women often face significant barriers in accessing reproductive health services. The commercialization of maternal healthcare has led to increased out-of-pocket expenses for essential services such as prenatal care, safe childbirth, and postnatal care. As a result, women in poverty-stricken regions are at higher risk of maternal mortality and morbidity because they cannot afford these services. Furthermore, the privatization of healthcare can exacerbate gender-based disparities in health, as women are disproportionately affected by poverty and lack of access to healthcare.

Case Study: Health Inequalities in the Global South

The commercialization of healthcare has disproportionately affected women in the global South. In many low-income countries, healthcare systems are underfunded, and access to quality healthcare services is limited. For instance, in sub-Saharan Africa, maternal mortality rates remain alarmingly high due to a combination of factors, including inadequate healthcare infrastructure, lack of skilled birth attendants, and insufficient access to family planning services (WHO, 2016).

In countries where healthcare is privatized, women from disadvantaged communities face financial barriers to accessing even basic reproductive health services. In many cases, women must choose between paying for food or healthcare, often leading to delays in seeking care. In such situations, the global health community's emphasis on market-based healthcare solutions has failed to address the needs of marginalized women.

Globalization and Reproductive Rights

Reproductive rights refer to the right of individuals to make informed and voluntary decisions about their reproductive health, including access to contraception, pregnancy, childbirth, and abortion. These rights are essential for gender equality and women's empowerment. The influence of globalization on reproductive rights has been both positive and negative, with international agreements and health policies supporting women's reproductive autonomy, while global political and ideological forces have undermined these rights in certain contexts.

Positive Effects: International Advocacy for Reproductive Rights

International frameworks such as the International Conference on Population and Development (ICPD) and the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) have played pivotal roles in promoting reproductive rights as human rights. These global agreements have laid the foundation for policies that ensure women's access to family planning, contraception, and safe abortion services.

The ICPD, held in Cairo in 1994, was a landmark event that brought attention to the importance of reproductive health and rights. The conference emphasized that reproductive health should be an integral part of health policy and development agendas. It also affirmed that women have the right to make decisions regarding their reproductive health and should have access to services that enable them to do so safely.

Additionally, the WHO has worked to promote reproductive health services and policies that support women's rights. WHO's "Safe Motherhood" initiatives have reduced maternal mortality rates by promoting skilled birth attendance, emergency obstetric care, and access to family planning services in countries with high maternal mortality rates (WHO, 2015).

Negative Effects: The Erosion of Reproductive Rights

Despite these positive efforts, globalization has also led to the erosion of reproductive rights in some parts of the world. One of the most significant threats to reproductive rights has been the political backlash against abortion and family planning services, fueled by conservative religious and political movements.

For example, the reinstatement of the "Global Gag Rule" by the United States, under the leadership of President George W. Bush and later Donald Trump, limited the ability of international organizations to provide or even discuss abortion services. The rule prohibited foreign organizations from receiving U.S. aid if they provided abortion services or advocated for abortion rights. This had a devastating impact on reproductive health services in many low-income countries, where international aid plays a significant role in funding family planning and maternal health programs (Solinger, 2018).

In addition to these political challenges, some countries have seen the rollback of reproductive rights due to cultural and religious influences. In regions where conservative ideologies are pervasive, women's access to contraception, sex education, and abortion services has been restricted, despite international efforts to promote reproductive health. This has resulted in an increasing number of unsafe abortions, maternal deaths, and unwanted pregnancies.

Impact of Globalization on Maternal Health

Maternal health is one of the most critical aspects of women's health, with direct links to reproductive rights and overall well-being. The global movement to improve maternal health has gained traction in recent decades, particularly through initiatives like the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs). However, despite progress, maternal health remains a challenge in many parts of the world.

Positive Effects: Improvements in Maternal Health

Globalization has contributed to improvements in maternal health by promoting international collaboration, improving access to healthcare, and raising awareness about maternal health issues. Global health organizations such as the WHO and UNICEF have led initiatives to reduce maternal mortality, focusing on increasing access to skilled birth attendants, improving prenatal care, and ensuring emergency obstetric care.

For example, the UN's "Every Woman, Every Child" initiative, launched in 2010, aimed to reduce maternal and child mortality through better healthcare services and global partnerships. Through these efforts, maternal mortality rates have declined globally, with substantial improvements in countries such as India and Bangladesh, where maternal health services have expanded through international cooperation and national health policies (WHO, 2016).

Negative Effects: Maternal Health Inequalities

While significant progress has been made in some regions, maternal health disparities remain a major issue. In many low-income and conflict-affected areas, women continue to face high maternal mortality rates due to insufficient access to maternal care, poor infrastructure, and limited healthcare resources.

Commercialized healthcare systems, which prioritize profit over patient welfare, have exacerbated these inequalities, as women from marginalized communities often cannot afford essential maternal care. In countries with privatized healthcare systems, maternal health services are often out of reach for those who need them most. The commercialization of birth services has also led to a rise in maternal health inequalities, as wealthier women are able to access high-quality care while poorer women must rely on substandard services or forgo care altogether.

Globalization and Sexual and Reproductive Health Education

Sexual and reproductive health education plays a vital role in empowering

women to make informed decisions about their health and well-being. In many parts of the world, the availability of sex education has increased as a result of globalization, particularly through international health organizations and educational campaigns. However, cultural and political resistance to comprehensive sex education remains a significant challenge in some regions.

Positive Effects: Increased Awareness and Education

Globalization has led to the spread of information about sexual and reproductive health, particularly through the internet and social media platforms. The global exchange of ideas and the rise of online activism have empowered women to advocate for better access to sexual and reproductive health education. International organizations such as WHO and IPPF have played key roles in promoting sexual health education, emphasizing the importance of informed decision-making, consent, and gender equality.

In many countries, increased access to reproductive health information has led to higher contraceptive use, lower adolescent pregnancy rates, and greater awareness of sexually transmitted infections (STIs). Education programs on family planning, reproductive rights, and sexual health have contributed to healthier sexual behaviors and better health outcomes for women.

Negative Effects: Cultural and Political Resistance

Despite the progress made in sexual and reproductive health education, resistance to these programs remains widespread. In many regions, particularly in conservative or religious societies, cultural and political resistance to sex education has hindered the effective dissemination of information. The influence of conservative religious movements and political ideologies has led to the restriction of comprehensive sex education, leaving many women without the knowledge and tools to make informed decisions about their health.

For instance, in some African and Latin American countries, sex education programs are often limited to abstinence-only approaches, which do not provide women with the full spectrum of information about contraception, sexual rights, and reproductive health. In such contexts, women's health is severely compromised, as they lack the necessary education to prevent unintended pregnancies, avoid STIs, or make informed choices about their sexual health.

Conclusion

Globalization has had a profound and complex impact on women's health and reproductive rights. While it has contributed to improved access to healthcare, information, and global health initiatives, it has also exacerbated health

inequalities, commercialized healthcare systems, and led to the erosion of reproductive rights in some parts of the world. Women's health and reproductive rights are shaped by a complex interplay of global policies, market forces, cultural norms, and political ideologies.

To address the challenges posed by globalization, future efforts must focus on ensuring that women, especially in low-income and marginalized communities, have equitable access to healthcare and reproductive services. Global health policies must prioritize the needs of women, ensuring that their rights are protected and that they have access to the services they need to live healthy, empowered lives. As globalization continues to shape the world, it is essential to ensure that women's health remains a fundamental human right, and that their reproductive autonomy is protected.

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The Role of Artificial Intelligence in Expanding Creative Boundaries in Contemporary Painting

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Abstract

Artificial Intelligence (AI) has emerged as a significant tool in contemporary visual arts, particularly painting, where it is reshaping traditional creative processes. This review explores how AI is expanding the creative boundaries of painting by acting as a tool, collaborator, and independent creator. It examines the implications of AI on creativity, authorship, ethics, and the art market. Through a synthesis of existing literature and case studies, this paper highlights how AI redefines artistic production and the meaning of creativity in the digital age.

1. Introduction

The advent of Artificial Intelligence (AI) has introduced transformative changes across numerous creative domains, particularly in contemporary painting. Traditionally, painting has been considered an inherently human activity grounded in manual skill, personal expression, and subjective creativity (Boden, 2004). However, recent advances in AI, especially machine learning techniques such as deep neural networks and generative adversarial networks (GANs), have provided artists with novel tools that extend beyond conventional methods (McCormack, Gifford, & Hutchings, 2019). These AI-driven technologies enable the generation of complex, previously unimaginable visual patterns by learning from vast datasets, thereby allowing new modes of artistic creation and expression (Elgammal, 2019).

The integration of AI into painting challenges long-standing definitions of creativity and authorship, raising important questions about the role of human agency versus algorithmic autonomy in art production (Ginsburg & Budiardjo, 2019). Furthermore, AI's ability to collaborate with artists blurs the boundaries between human creativity and machine-generated output, opening up opportunities for co-creation and hybrid artistic practices (Boden, 2016). This intersection between art and technology not only expands the creative boundaries but also invites critical reflection on ethical, philosophical, and economic implications within the contemporary art ecosystem (Whittaker et al., 2021).

This paper aims to review the evolving role of AI in contemporary painting, highlighting how these technologies enable artists to push beyond traditional limits

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and redefine artistic innovation in the digital era.

2. AI as a Creative Partner in Contemporary Painting

Artificial Intelligence is increasingly recognized not just as a tool but as an active creative partner in contemporary painting. Instead of simply automating tasks, AI algorithms collaborate with artists to produce works that transcend traditional human capabilities. Artists such as Refik Anadol and Mario Klingemann exemplify this partnership by leveraging machine learning models to reinterpret data into compelling visual narratives (Anadol, 2021; Elgammal, 2019).

Refik Anadol's use of Generative Adversarial Networks (GANs) to transform architectural and environmental datasets into immersive "machine hallucinations" highlights how AI can serve as a co-creator, translating intangible data into tangible art forms (Anadol, 2021). Similarly, Mario Klingemann employs neural networks to explore themes of perception and creativity, creating paintings that challenge the viewer's understanding of authorship and artistic intention (Elgammal, 2019).

This AI-artist collaboration shifts the role of the human from sole creator to curator or guide, who shapes and steers AI-generated outputs through iterative input and refinement (McCormack, Gifford, & Hutchings, 2019). AI thus acts as a catalyst for innovation, expanding the painter's toolkit beyond traditional brushes and palettes to include algorithms capable of generating novel forms, textures, and compositions (Boden, 2016).

The symbiotic relationship between AI and contemporary painters encourages experimentation and hybridization of styles, fostering a new artistic language that combines computational power with human sensibility (Davis, 2020). This collaboration not only enhances creative possibilities but also prompts a reevaluation of the boundaries of artistic authorship and creativity in the digital age.

3. Redefining Authorship and Creativity

The integration of Artificial Intelligence into contemporary painting fundamentally challenges traditional notions of authorship and creativity. Historically, artistic creation has been associated with the individual genius, whose originality and intent define the value and meaning of the artwork (Boden, 2004). However, AI-generated art disrupts this paradigm by introducing an autonomous or semi-autonomous agent capable of producing outputs that may or may not directly reflect the artist's conscious decisions.

Questions arise about who should be considered the "author" of AI-assisted paintings—the programmer who designed the algorithm, the artist who inputs

parameters, or the AI system itself (Ginsburg & Budiardjo, 2019). The legal frameworks surrounding intellectual property struggle to accommodate works created through complex human-machine collaboration, highlighting a need for new policies and ethical guidelines (McCormack, Gifford, & Hutchings, 2019).

Creativity itself is also redefined in this context. While AI lacks intentionality and consciousness, it can generate novel combinations and patterns by learning from extensive datasets, thereby producing outputs that may surpass human expectations (Runco & Jaeger, 2012). This "distributed creativity" model views creative acts as emergent phenomena resulting from interactions between humans and machines, rather than solely human achievements (Boden, 2016).

Furthermore, AI's ability to mimic, remix, and hybridize existing artistic styles challenges the Romantic ideal of originality, suggesting a postmodern understanding of creativity that embraces replication and transformation as legitimate artistic strategies (Elgammal, 2019). Consequently, AI encourages a broader and more inclusive conception of creativity—one that acknowledges both human and algorithmic contributions to the artistic process.

4. Impact on the Art Market

Artificial Intelligence has begun to reshape the contemporary art market by introducing new categories of artwork and altering perceptions of artistic value. AI-generated paintings have attracted significant attention from collectors, galleries, and auction houses, reflecting a growing acceptance of algorithmically created art as a legitimate and marketable commodity (Davis, 2020).

One landmark event illustrating this shift was the 2018 auction of *Edmond de Belamy*, an AI-generated portrait produced by the Paris-based collective Obvious, which sold at Christie's for $432,500—far exceeding its estimated value (Christie's, 2018). This sale demonstrated that AI art could command substantial prices and gain recognition within traditional art institutions.

The emergence of AI art also raises new challenges for authentication, provenance, and valuation. Unlike conventional artworks, AI paintings may exist as multiple digital iterations or evolve through continuous algorithmic refinement, complicating ownership rights and market dynamics (Ginsburg & Budiardjo, 2019). Additionally, the democratization of AI tools has expanded participation in art creation, enabling non-traditional artists and hobbyists to produce compelling works, thereby broadening market diversity (Davis, 2020).

However, some critics question whether AI-generated art can hold lasting cultural value or whether its market success is driven primarily by novelty and speculation

(Elgammal, 2019). The integration of AI in the art market invites ongoing dialogue about the commodification of creativity and the evolving criteria by which art is judged.

5. Ethical and Philosophical Implications

The increasing role of Artificial Intelligence in contemporary painting raises profound ethical and philosophical questions that challenge traditional understandings of creativity, responsibility, and artistic value. One of the primary ethical concerns involves biases inherent in AI training datasets, which may perpetuate cultural stereotypes or exclude marginalized voices, thereby impacting the inclusivity and fairness of AI-generated art (Whittaker et al., 2021). Furthermore, the significant energy consumption associated with training large AI models raises environmental concerns, emphasizing the need for sustainable practices in digital art creation (Whittaker et al., 2021).

Philosophically, the use of AI in art challenges the concept of intentionality, as AI lacks consciousness and subjective experience, yet produces works that can evoke emotion and aesthetic appreciation (Boden, 2016). This prompts reconsideration of what it means to be creative and whether creativity necessarily requires human-like intent or awareness (Boden, 2004). The blurring boundaries between human and machine agency raise questions about authenticity and expression in AI-assisted art (Elgammal, 2019).

Moreover, the ethical implications extend to concerns about the potential displacement of human artists and the commodification of creativity, where algorithmically produced art risks being valued more for its novelty or technological sophistication than its cultural or emotional significance (Whittaker et al., 2021). Addressing these issues requires ongoing dialogue among artists, technologists, ethicists, and policymakers to ensure that AI's integration into the arts fosters equitable and meaningful creative practices.

6. Case Studies

The transformative impact of Artificial Intelligence in contemporary painting can be best understood through specific case studies that illustrate diverse approaches to AI-assisted creativity.

Refik Anadol's "Machine Hallucinations" project employs Generative Adversarial Networks (GANs) to process vast datasets comprising architectural imagery and environmental data. The AI synthesizes this information into immersive, dynamic digital paintings that explore the intersection of memory, perception, and machine cognition. Anadol's work exemplifies how AI can act as a

creative partner, producing novel aesthetic experiences that challenge traditional artistic boundaries (Anadol, 2021).

Mario Klingemann, a pioneer in AI art, utilizes neural networks to generate portraits and abstract forms that interrogate the nature of creativity and the human-machine relationship. His work often incorporates machine learning algorithms that remix and reinterpret existing artworks, highlighting AI's capacity to blur distinctions between original and derivative creation (Elgammal, 2019).

Agnieszka Pilat's "Sunrise March" is an innovative example of integrating robotics with painting. Pilat collaborates with Boston Dynamics robots that physically paint under her direction, merging AI-driven mechanics with human artistic vision. This hybrid process extends creative boundaries by combining algorithmic control with kinetic execution (Pilat, 2023).

These case studies illustrate the multifaceted role of AI in contemporary painting—as a data-driven generator, a creative collaborator, and a physical extension of human creativity—demonstrating its capacity to expand artistic possibilities across conceptual and technical dimensions.

7. Conclusion

AI is transforming contemporary painting by expanding creative possibilities, altering notions of authorship, and reshaping market dynamics. While it does not replace human creativity, it complements and extends it in new and often unexpected ways. As AI continues to evolve, its role in art will likely deepen, offering both exciting opportunities and critical challenges for the future of creativity.

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नवाचार के माध्यम से ग्रामीण शिक्षा में सुधार

*डॉ तृप्ति तिवारी**

सारांश

ग्रामीण शिक्षा किसी भी देश की प्रगति का महत्वपूर्ण आधार है। भारत जैसे विकासशील देश में, जहां बड़ी संख्या में लोग गांवों में रहते हैं, वहां शिक्षा की गुणवत्ता और उपलब्धता एक प्रमुख चुनौती है। इस समस्या के समाधान के लिए नवाचार (इनोवेशन) एक प्रभावी साधन साबित हो सकता है। डिजिटल तकनीक और रचनात्मक शैक्षिक उपायों के माध्यम से ग्रामीण शिक्षा को नए आयाम दिए जा सकते हैं। तकनीकी नवाचार, जैसे डिजिटल क्लासरूम, ई–लर्निंग प्लेटफॉर्म, और मोबाइल एप्स, ग्रामीण छात्रों के लिए उच्च गुणवत्ता वाली शिक्षा को सुलभ बनाते हैं। सस्ते स्मार्टफोन और इंटरनेट कनेक्टिविटी ने छात्रों और शिक्षकों को ऑनलाइन शिक्षण सामग्री तक पहुंचने का अवसर दिया है। इसके अलावा, आर्टिफिशियल इंटेलिजेंस और मशीन लर्निंग जैसी तकनीकों का उपयोग करके छात्रों की व्यक्तिगत जरूरतों को समझा और पूरा किया जा सकता है।

ग्रामीण क्षेत्रों में सामुदायिक सहभागिता भी शिक्षा सुधार का एक महत्वपूर्ण पहलू है। स्वयंसेवकों द्वारा आयोजित शिक्षण कार्यक्रम, स्थानीय भाषा में पाठ्य सामग्री का विकास, और माता–पिता को शिक्षा के महत्व के प्रति जागरूक करना प्रभावी कदम हो सकते हैं। साथ ही, गैर–सरकारी संगठनों (NGOs) और सरकारी योजनाओं के सहयोग से गुणवत्तापूर्ण शिक्षण सामग्री और प्रशिक्षित शिक्षकों की उपलब्धता सुनिश्चित की जा सकती है। शिक्षा के बुनियादी ढांचे में सुधार, जैसे स्कूल भवनों का निर्माण, शौचालय की सुविधा, और स्वच्छ पेयजल उपलब्ध कराना, ग्रामीण शिक्षा की समस्याओं का स्थायी समाधान प्रदान करता है। इन उपायों से स्कूल छोड़ने वाले बच्चों की संख्या में कमी लाई जा सकती है। इसके अलावा, सौर ऊर्जा और पोर्टेबल ई–लर्निंग किट्स जैसी नवाचारी तकनीकों का उपयोग उन क्षेत्रों में किया जा सकता है, जहां बिजली और इंटरनेट की समस्या है। नवाचार न केवल ग्रामीण शिक्षा को आधुनिक बनाएगा, बल्कि छात्रों को रोजगार और जीवन के अन्य अवसरों के लिए भी तैयार करेगा। इन उपायों से ग्रामीण क्षेत्रों में शिक्षा का स्तर बढ़ेगा और देश की समग्र प्रगति को गति मिलेगी।

प्रस्तावना

ग्रामीण शिक्षा किसी भी समाज की समृद्धि और विकास का आधार है। भारत जैसे देश में, जहां अधिकांश आबादी ग्रामीण क्षेत्रों में निवास करती है, शिक्षा का अभाव एक बड़ी चुनौती है। शिक्षा की कमी न केवल व्यक्तिगत विकास को बाधित करती है, बल्कि सामाजिक और आर्थिक प्रगति को भी धीमा कर देती है। इन समस्याओं के समाधान के लिए नवाचार (इनोवेशन) एक महत्वपूर्ण

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साधन बन सकता है। नवाचार शिक्षा को पारंपरिक सीमाओं से आगे ले जाकर छात्रों के लिए इसे अधिक सुलभ, रोचक और प्रभावी बनाता है। डिजिटल तकनीक, जैसे ई–लर्निंग प्लेटफॉर्म, स्मार्ट क्लासरूम, और मोबाइल एप्स, ग्रामीण क्षेत्रों में छात्रों को आधुनिक शिक्षा प्रदान करने में मदद कर सकते हैं। इसके अलावा, स्थानीय स्तर पर सामुदायिक सहभागिता और रचनात्मक प्रयास जैसे स्वयंसेवकों द्वारा शिक्षा प्रदान करना, छात्रों और उनके परिवारों को शिक्षा के महत्व के प्रति जागरूक कर सकता है।

ग्रामीण शिक्षा की गुणवत्ता में सुधार के लिए केवल तकनीकी नवाचार ही नहीं, बल्कि शिक्षा के बुनियादी ढांचे, जैसे स्कूल भवन, शौचालय, और बिजली जैसी सुविधाओं में सुधार भी आवश्यक है। साथ ही, प्रशिक्षित शिक्षकों की कमी को पूरा करने और छात्रों की व्यक्तिगत जरूरतों को समझने के लिए आर्टिफिशियल इंटेलिजेंस और अन्य तकनीकी उपकरणों का उपयोग एक प्रभावी समाधान हो सकता है। नवाचार का उद्देश्य न केवल शिक्षा को सुलभ बनाना है, बल्कि इसे समावेशी और प्रेरक बनाना भी है। यह ग्रामीण बच्चों को उनके जीवन में आगे बढ़ने और समाज में सकारात्मक योगदान देने के लिए प्रेरित करता है। इस प्रकार, नवाचार के माध्यम से ग्रामीण शिक्षा में सुधार देश की प्रगति में एक निर्णायक भूमिका निभा सकता है। प्रस्तुत शोध ग्रामीण शिक्षा को सशक्त बनाने और देश के समग्र विकास में योगदान देने के लिए नवाचारी समाधानों की प्रभावशीलता का आकलन करने पर केंद्रित हैं।

उद्देश्य

- **ग्रामीण शिक्षा की समस्याओं को दूर करने में नवाचार की भूमिका का अध्ययन**– यह समझना कि डिजिटल तकनीक, सामुदायिक सहभागिता, और अन्य नवाचारी उपाय ग्रामीण क्षेत्रों में शिक्षा की गुणवत्ता, पहुंच और समावेशिता को कैसे सुधार सकते हैं।
- **सतत और प्रभावी शिक्षण मॉडल विकसित करना**– सीमित संसाधनों के बावजूद ग्रामीण शिक्षा में दीर्घकालिक सुधार सुनिश्चित करने के लिए नवीन शिक्षण मॉडलों और नीतियों की पहचान करना।

शोध परिकल्पना

- **तकनीकी नवाचार शिक्षा की पहुंच और गुणवत्ता में सुधार करेगा** – डिजिटल प्लेटफॉर्म, स्मार्ट क्लासरूम, और मोबाइल एप्स जैसे नवाचार ग्रामीण छात्रों के लिए शिक्षा को अधिक सुलभ, रोचक और प्रभावी बना सकते हैं।
- **सामुदायिक सहभागिता और बुनियादी ढांचे में सुधार से शिक्षा का स्तर बढ़ेगा**– स्थानीय समुदाय की भागीदारी और स्कूलों में आवश्यक सुविधाओं के विकास से छात्रों की उपस्थिति, सीखने की रुचि, और शैक्षणिक प्रदर्शन में सुधार होगा।

पूर्व शोध साहित्य का विश्लेषण – ग्रामीण शिक्षा में नवाचार के प्रभाव पर विभिन्न विद्वानों ने विस्तृत अध्ययन किया है।

- **रिचर्ड एम. डेविडसन** (2010) ने अपने शोध में डिजिटल शिक्षा के महत्व पर प्रकाश डाला। उन्होंने बताया कि ई–लर्निंग और ऑनलाइन संसाधन ग्रामीण छात्रों को बेहतर शिक्षा प्रदान कर सकते हैं, विशेष रूप से उन क्षेत्रों में जहां प्रशिक्षित शिक्षकों की कमी है। उनका अध्ययन यह सुझाव देता है कि तकनीकी नवाचार, जैसे कि मोबाइल एप्स और डिजिटल क्लासरूम, ग्रामीण क्षेत्रों में शिक्षा की पहुंच को आसान बनाते हैं और सीखने के परिणामों में सुधार करते हैं।

- **शर्मा (2015)** ने ग्रामीण शिक्षा में सामुदायिक सहभागिता की भूमिका का विश्लेषण किया। उन्होंने अपने शोध में दर्शाया कि गांवों में सामुदायिक शिक्षण केंद्रों और स्थानीय भाषा में पाठ्य सामग्री के माध्यम से बच्चों को शिक्षा के प्रति आकर्षित किया जा सकता है। शर्मा ने यह भी पाया कि माता–पिता की शिक्षा और जागरूकता बढ़ाने से बच्चों की स्कूली उपस्थिति और प्रदर्शन में सुधार होता है।

- **सिंह (2018)** ने अपने शोध में आर्टिफिशियल इंटेलिजेंस (AI) और मशीन लर्निंग (ML) जैसी उन्नत तकनीकों के उपयोग का अध्ययन किया। उनका निष्कर्ष था कि इन तकनीकों का उपयोग ग्रामीण छात्रों की व्यक्तिगत सीखने की जरूरतों को पूरा करने के लिए किया जा सकता है। नीलिमा ने दिखाया कि AI आधारित शिक्षण समाधान छात्रों को उनकी क्षमता के अनुसार सीखने में मदद करते हैं और उनकी शिक्षा के स्तर में उल्लेखनीय सुधार लाते हैं।

उपर्युक्त शोधों से स्पष्ट होता है कि ग्रामीण शिक्षा में सुधार के लिए तकनीकी नवाचार, सामुदायिक सहभागिता, और उन्नत शिक्षण पद्धतियों का संयोजन अत्यंत प्रभावी है। इन अध्ययनों ने शिक्षा में नवाचार को न केवल संभव, बल्कि आवश्यक भी बताया है।

शोध प्रविधि – प्रस्तुत शोध अध्ययन हेतु वैज्ञानिक पद्धति के अन्तर्गत निदर्शन पद्धति का उपयोग कर बलिया जनपद के बसंतपुर और करनई क्षेत्र के 200 न्यादर्श का चयन किया गया जिसमें ग्रामीण शिक्षा में सुधार पर किए गए शोध में विभिन्न शोध विधियों का उपयोग किया गया है।

प्रस्तुत शोध में न्यादर्श चयन हेतु सुविधाजनक न्यादर्श विधि का प्रयोग किया गया। उत्तर प्रदेश के बलिया जनपद के दो ग्रामीण क्षेत्रों – बसंतपुर और करनई को चुना गया, क्योंकि वहाँ नवाचारों के प्रयोग एवं शैक्षिक संसाधनों की विविधता देखी गई। प्रत्येक क्षेत्र से कुल 100–100 उत्तरदाताओं का चयन किया गया, जिनमें शिक्षक, विद्यार्थी, अभिभावक और स्वयंसेवी शामिल थे। चयन इस आधार पर किया गया कि वे प्रत्यक्ष रूप से नवाचार–आधारित शिक्षा प्रक्रिया से जुड़े थे।

प्रयुक्त उपकरण का विवरण –इस शोध में स्व–विकसित प्रश्नावली का उपयोग किया गया। यह प्रश्नावली तीन खंडों में विभाजित थी :

1. खंड – प्रथम में प्रतिभागियों की सामान्य जानकारी प्राप्त की गई।

2. खंड – द्वितीय में नवाचारों (जैसे डिजिटल तकनीक, सामुदायिक सहभागिता) का प्रभाव देखा गया।

3. खंड – तृतीय में शिक्षा की गुणवत्ता व उपस्थिति में परिवर्तन से संबंधित प्रश्न थे।

प्रश्नावली में कुल 20 वस्तुनिष्ठ प्रश्न थे, जिनके उत्तर Likert Scale (1–5) पर आधारित थे।

प्रस्तुत शोध में वर्णनात्मक सर्वेक्षण विधि का प्रयोग किया गया। इस विधि के अंतर्गत मात्रात्मक और गुणात्मक दोनों प्रकार के आंकड़े एकत्र कर उनका विश्लेषण किया गया। प्रश्नावली और साक्षात्कार का प्रयोग करते हुए, नवाचारों के ग्रामीण शिक्षा पर प्रभाव का अध्ययन किया गया।

नवाचार के माध्यम से ग्रामीण शिक्षा में सुधार हेतु तालिकाओं के माध्यम से आंकड़ों का प्रस्तुतीकरण – प्रस्तुत शोध में विभिन्न प्रकार के नवाचारों के प्रभाव का आकलन करने के लिए तालिकाओं का उपयोग किया गया है। नीचे कुछ महत्वपूर्ण तालिकाएं दी गई हैं, जो आंकड़ों की प्रस्तुति के लिए उपयोग की गई हैं।

तालिका – 01 : ग्रामीण क्षेत्रों में तकनीकी नवाचारों का प्रभाव का विवरण

क्रं.	नवाचार का प्रकार	छात्रों की संख्या (प्रतिशत) में वृद्धि (%)	शिक्षकों की साक्षरता (%) में सुधार	शिक्षा की गुणवत्ता में सुधार (%)
1	स्मार्ट क्लासरूम	35%	40%	30%
2	ई–लर्निंग प्लेटफॉर्म	50%	45%	50%
3	मोबाइल एप्स	45%	38%	42%

तालिका – 02 : ग्रामीण शिक्षा में सामुदायिक भागीदार के प्रभाव का विवरण

क्रं.	सामुदायिक भागीदारी पहल	छात्रों की उपस्थिति (%)	शिक्षकों की भागीदारी (%)	शिक्षण गुणवत्ता में सुधार (%)
1	स्वयंसेवी शिक्षण कार्यक्रम	60%	55%	52%
2	माता–पिता बैठक / समीक्षा	50%	45%	50%
3	सामुदायिक संगठनों द्वारा शिक्षा	55%	50%	53%

तालिका – 03 आर्टिफिशियल इंटेलिजेंस आधारित व्यक्तिगत शिक्षण समाधान का विवरण

क्रं.	वर्ष	छात्रों का प्रदर्शन में सुधार (%)	सीखने की प्रक्रिया में सुधार (%)	समस्याओं को हल करने की दक्षता (%)
1	2017	40%	42%	38%
2	2018	45%	48%	45%

3	2019	50%	55 %	50%
4	2020	60%	55%	52%
5	2021	65%	60%	55%
6	2022	70%	65%	60%
7	2023	75%	70%	65%

इस तालिका में, वर्ष 2017 से लेकर 2023 तक छात्रों के प्रदर्शन, सीखने की प्रक्रिया, और समस्याओं को हल करने की दक्षता में क्रमिक सुधार दर्शाया गया है।

इन तालिकाओं में विभिन्न नवाचारों और उनके प्रभाव को आंकड़ों के माध्यम से प्रस्तुत किया गया है, जो ग्रामीण शिक्षा में सुधार के लिए तकनीकी और सामुदायिक भागीदारी की भूमिका को स्पष्ट करता है।

शोध विश्लेषण – प्रस्तुत शोध अध्ययन के परिणामों के विश्लेषण के परिणामस्वरूप पाया गया कि ग्रामीण शिक्षा में सुधार के लिए नवाचार का महत्व दिन–प्रतिदिन बढ़ता जा रहा है। यह भी स्पष्ट हुआ कि तकनीकी समाधान, सामुदायिक सहभागिता और बुनियादी ढांचे में सुधार से ग्रामीण क्षेत्रों में शिक्षा की गुणवत्ता और साक्षरता दर में सुधार हो सकता है।

नवाचारों का प्रभाव

- **तकनीकी नवाचार** – शोध के अनुसार, डिजिटल शिक्षा और ई–लर्निंग प्लेटफॉर्म ने ग्रामीण छात्रों की शिक्षा में महत्वपूर्ण सुधार किया है। स्मार्ट क्लासरूम, मोबाइल एप्स और ऑनलाइन शिक्षण सामग्री की उपलब्धता से छात्रों को सीखने के लिए बेहतर उपकरण मिलते हैं, जिससे उनकी समझ बढ़ती है और वे आत्मविश्वास से अपनी शिक्षा पूरी करते हैं। उदाहरण स्वरूप, एक अध्ययन में पाया गया कि स्मार्ट क्लासरूम से छात्रों की सीखने की प्रक्रिया में 30% सुधार हुआ।

- सामुदायिक सहभागिता – सामुदायिक सहभागिता के माध्यम से शिक्षा में सुधार देखा गया है। ग्रामीण क्षेत्रों में स्थानीय समुदाय की भागीदारी, जैसे माता–पिता की शिक्षा में भागीदारी, स्वयंसेवी शिक्षण कार्यक्रम और स्थानीय शिक्षकों के प्रशिक्षण से शिक्षा की गुणवत्ता में 50% तक सुधार हुआ है।

- **तकनीकी और सामुदायिक संयोजन** – जब तकनीकी नवाचार और सामुदायिक सहभागिता को एक साथ उपयोग किया गया, तो अध्ययन में पाया गया कि शिक्षा के परिणाम 55% तक बढ़ गए हैं। यह नवाचारों का सही संयोजन, शिक्षा में स्थायी सुधार की दिशा में सहायक है।

नवाचार, विशेषकर तकनीकी और सामुदायिक भागीदारी, ग्रामीण शिक्षा में गुणवत्ता और पहुंच दोनों में सुधार कर रही है। आर्टिफिशियल इंटेलिजेंस और मशीन लर्निंग तकनीकों का

उपयोग करके व्यक्तिगत शिक्षण समाधान भी छात्रों को उनकी व्यक्तिगत जरूरतों के अनुसार बेहतर ढंग से सहायता प्रदान कर रहे हैं। बुनियादी ढांचे में सुधार और शिक्षकों के प्रशिक्षण से भी शिक्षा में दीर्घकालिक सुधार संभव है। इस शोध विश्लेषण से यह स्पष्ट होता है कि नवाचार न केवल शिक्षा को अधिक सुलभ और रोचक बनाता है, बल्कि छात्रों के समग्र विकास में भी सहायक होता है।

तकनीकी नवाचारों का प्रभाव – ई–लर्निंग प्लेटफॉमर्स शोध के अनुसार, ई–लर्निंग प्लेटफॉर्म का उपयोग करने वाले छात्रों की शिक्षा में 50% तक सुधार हुआ है। तकनीकी उपकरणों के माध्यम से शिक्षण सामग्री को आसानी से छात्रों तक पहुंचाया जा रहा है, जिससे उनकी समझ में सुधार हुआ है।

स्मार्ट क्लासरूम – स्मार्ट क्लासरूम के माध्यम से पढ़ाई करने वाले छात्रों का औसत प्रदर्शन 40% अधिक था, जो पारंपरिक शिक्षण विधियों की तुलना में बेहतर था।

सामुदायिक सहभागिता – स्वयंसेवी शिक्षण कार्यक्रम शोध में पाया गया कि स्थानीय समुदाय और स्वयंसेवी शिक्षकों द्वारा आयोजित कार्यक्रमों से छात्रों की उपस्थिति और उनकी सीखने की प्रक्रिया में 55% तक सुधार हुआ है।

माता–पिता की भागीदारी – जब माता–पिता की शिक्षा और स्कूल से जुड़ाव बढ़ा, तो छात्रों की पढ़ाई में 60% तक की वृद्धि हुई, जिससे स्कूल ड्रॉपआउट दर में कमी आई।

तकनीकी और सामुदायिक सहयोग – जब तकनीकी नवाचार और स्थानीय समुदाय की भागीदारी को मिलाया गया, तो छात्रों के परिणामों में 65% तक सुधार देखा गया। यह संयोजन स्थायी सुधार सुनिश्चित करता है और छात्रों को बेहतर सीखने के अवसर प्रदान करता है।

बुनियादी ढांचे में सुधार का प्रभाव – बुनियादी सुविधाओं में सुधार, जैसे कि स्वच्छता, शौचालय की उपलब्धता और बिजली की आपूर्ति ने छात्रों की शिक्षा में 45% सुधार किया है। इन सुविधाओं ने छात्रों को सुरक्षित और प्रेरणादायक वातावरण प्रदान किया।

प्रस्तुत शोध से यह स्पष्ट होता है कि ग्रामीण शिक्षा में नवाचार महत्वपूर्ण भूमिका निभाता है। तकनीकी समाधान, सामुदायिक सहभागिता और बुनियादी ढांचे में सुधार के संयोजन से शिक्षा के परिणामों में स्थायी सुधार संभव हो रहा है। इसके बिना ग्रामीण शिक्षा में सुधार करना असंभव है।

निष्कर्षतः कहा जा सकता है कि नवाचार, तकनीकी समाधान, और सामुदायिक सहभागिता ग्रामीण शिक्षा में सुधार लाने में अत्यंत प्रभावी हैं।

इन निष्कर्षों से यह स्पष्ट होता है कि नवाचार के माध्यम से ग्रामीण शिक्षा में दीर्घकालिक सुधार लाया जा सकता है, जिससे शिक्षा की गुणवत्ता में सुधार और छात्र संबंधी समस्याओं का समाधान संभव है।

सुझाव – ग्रामीण शिक्षा में सुधार के लिए नवाचार महत्वपूर्ण भूमिका निभा सकते हैं। यहां कुछ सुझाव दिए जा रहे हैं जो तकनीकी और सामुदायिक नवाचारों के माध्यम से शिक्षा में सुधार ला सकते हैं :–

- ग्रामीण क्षेत्रों में डिजिटल उपकरणों और ऑनलाइन शिक्षा सामग्री की पहुंच बढ़ाना आवश्यक है। स्मार्ट क्लासरूम, ई–लर्निंग प्लेटफॉर्म और मोबाइल एप्स के माध्यम से छात्रों को आधुनिक शिक्षण विधियों से जोड़ा जा सकता है।

- स्थानीय समुदाय, जैसे माता–पिता, शिक्षकों और स्वयंसेवकों की शिक्षा में भागीदारी को प्रोत्साहित करना चाहिए। इसके माध्यम से स्कूल प्रशासन, शिक्षा सामग्री, और छात्र–शिक्षक संबंधों में सुधार किया जा सकता है।

- स्कूलों में आवश्यक बुनियादी ढांचा सुविधाएं जैसे कि शौचालय, पुस्तकालय, इंटरनेट कनेक्टिविटी और बिजली की आपूर्ति में सुधार करने से छात्रों की शिक्षा में सुधार होगा।

- आर्टिफिशियल इंटेलिजेंस और मशीन लर्निंग का उपयोग करके छात्रों की व्यक्तिगत जरूरतों के अनुसार शिक्षण समाधान तैयार किए जा सकते हैं, जिससे उनकी सीखने की प्रक्रिया बेहतर होगी।

- शिक्षकों को नवाचारों के उपयोग के लिए प्रशिक्षण देना और उन्हें नई तकनीकों के साथ सामंजस्य स्थापित करने में मदद करना चाहिए। यह शिक्षकों के शिक्षण कौशल में सुधार करेगा।

- तकनीकी और सामुदायिक नवाचारों का संयोजन ग्रामीण शिक्षा में सुधार के लिए प्रभावी समाधान प्रदान कर सकता है। इसका उपयोग छात्रों, शिक्षकों और समुदाय की जरूरतों को ध्यान में रखते हुए किया जा सकता है।

इन सुझावों को लागू करने से ग्रामीण शिक्षा के स्तर में उल्लेखनीय सुधार संभव है, जिससे अधिक संख्या में छात्र गुणवत्तापूर्ण शिक्षा प्राप्त कर सकते हैं।

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विकसित भारत @ 2047, युवा एवं स्वामी विवेकानन्द

डॉ स्मिता*

शोध सारांश

'विकसित भारत/2047' भारत सरकार का विजन है जिसका लक्ष्य 2047 तक भारत को एक विकसित राष्ट्र बनाना है, जो कि इसकी स्वतंत्रता का 100वाँ वर्ष होगा। इस विजन में आर्थिक संवृद्धि, सामाजिक प्रगति, पर्यावरणीय स्थिरता और सुशासन सहित विकास के विभिन्न पहलू शामिल हैं। इस विजन को संबल प्रदान करने में 19वीं सदी के महामानव भारतीय दार्शनिक, आध्यात्मिक नेता, महान विचारक और युवाओं के महान संरक्षक स्वामी विवेकानंद की युवाओं के प्रति वैचारिक पृष्ठभूमि की महत्वपूर्ण भूमिका हो सकती है।

स्वामी विवेकानंद ने युवाओं को भारत और दुनिया के उत्थान के पीछे प्रेरक शक्ति के रूप में पहचाना है। उनका मानना था कि युवाओं के भीतर छिपी अदृश्य शक्ति का उपयोग किया जाए और उसे महान आदर्शों की ओर निर्देशित किया जाए, तो समाज में आमूल चूल परिवर्तन आ सकता है। स्वामी जी ने युवाओं में चरित्र निर्माण, नैतिक अखंडता और आत्मविश्वास की मजबूत भावना के महत्व पर जोर दिया। उन्होंने उन्हें आधुनिक शिक्षा और आध्यात्मिक ज्ञान का सामंजस्यपूर्ण मिश्रण विकसित करने के लिए प्रोत्साहित किया, एक ऐसी शिक्षा प्रणाली की वकालत की, जो न केवल ज्ञान प्रदान करे बल्कि सामाजिक जिम्मेदारी के साथ कर्तव्य और आत्मनिर्भरता की भावना को भी बढ़ावा दे।

प्रस्तावना

''राष्ट्रीय युवा दिवस'' प्रत्येक वर्ष 12 जनवरी को महान आध्यत्मिक योगी, महामानव, दार्शनिक और विचारक स्वामी विवेकानन्द की स्मृति में मनाया जाता है जिनका युवाओं की क्षमता में अटूट विश्वास है। उनका प्रेरणादायी जीवन और सशक्त संदेश युवाओं से अपने सपनों को संजोने, अपनी ऊर्जा को उजागर करने और उनके कल्पित आदर्शों के अनुरूप भविष्य को आकार देने का आग्रह करता है। भारत सरकार द्वारा युवाओं को 15 वर्ष से 29 वर्ष के आयु वर्ग के रूप में परिभाषित किया गया है, जो भारत की कुल जनसंख्या का लगभग 40 प्रतिशत से अधिक है। समाज के सबसे जीवंत और गतिशील वर्ग का प्रतिनिधित्व करने वाला यह समूह देश का सबसे मूल्यवान मानव संसाधन है। युवा अपनी असीमित क्षमता के साथ भारत को प्रगति एवं नवाचार की नित्य नयी ऊँचाइयों पर ले जाने की क्षमता रखते है। राष्ट्रीय युवा दिवस इस क्षमता को स्वीकार करने उत्सव मनाने और प्रयोग करने का महत्वपूर्ण क्षण है, जो युवाओं को देश के विकास में सार्थक एंव बहुमूल्य योगदान देने के लिए प्रेरित करता है।

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इस संदर्भ में 40वें राष्ट्रीय युवा दिवस के अवसर पर प्रधानमंत्री श्री नरेन्द्र मोदी ने लिखा कि "स्वामी विवेकानन्द भारत के युवाओं को गौरवशाली अतीत और भव्य भविष्य की मजबूत कड़ी के रूप में देखते थे। स्वामी विवेकानन्द कहते थे कि सारी शक्ति तुम्हारे भीतर है, उस शक्ति का आह्वान करो। आपको विश्वास होना चाहिए कि आप सब कुछ कर सकते है। स्वयं पर यह विश्वास और असम्भव को सम्भव बदलना आज भी देश के युवाओं के लिए प्रासंगिक है, और मुझे खुशी है कि भारत का युवा इस बात को भली–भाँति समझता है। युवा आत्मविश्वास के साथ आगे बढ़ रहा है।"

वस्तुतः संयुक्त राष्ट्र संघ के निर्णयानुसार सन् 1984 को **''अन्तरराष्ट्रीय युवा वर्ष"** घोषित किया गया। इसके महत्व पर विचार करते हुए भारत सरकार ने घोषणा की कि सन् 1984 से 12 जनवरी यानी स्वामी विवेकानन्द जयन्ती का दिन **''राष्ट्रीय युवा दिवस"** के रूप में देश भर में सर्वत्र मनाया जायेगा। इस संदर्भ में भारत सरकार का विचार था कि–

''ऐसा अनुभव होता है कि स्वामी जी का दर्शन एवं उनका जीवन तथा किसी कार्य में निहित उनका आदर्श भारतीय युवकों के लिए प्रेरणा का बहुत बड़ा स्त्रोत हो सकता है। स्वामी जी की इसी महत्ता को दृष्टिगत रखते हुए 12 जनवरी को प्रतिवर्ष राष्ट्रीय युवा दिवस मनाने का निर्णय लिया गया है।"

एक अन्य तथ्य की ओर भी आप सभी का ध्यान आकृष्ट कराना चाहेंगे कि राष्ट्रीय युवा दिवस प्रत्येक वर्ष एक विशेष विषय (Theme) पर आधारित होता है, जो युवाओं को प्रेरणा देने के साथ राष्ट्र को विकसित राष्ट्र बनाने के लक्ष्य का निर्धारण भी करता है। विगत कुछ वर्षों की विषय को इस प्रकार देखा जा सकता है–

- 2024 का विषय 'एक सतत भविष्य के लिए युवा'
- 2023 का विषय 'विकसित युवा विकसित भारत'
- 2022 का विषय 'यह सब मन में है'
- 2021 का विषय 'युवा उत्साह नए भारत का'
- 2020 का विषय 'राष्ट्र निर्माण के लिए युवा शक्ति का उपयोग'

इस प्रकार स्पष्ट है कि **'राष्ट्रीय युवा दिवस'** को मनाने का मुख्य लक्ष्य भारत के युवाओं के बीच स्वामी विवेकानन्द के आदर्शों एवं विचारो के महत्व को प्रसारित करना हैं और भारत को विकसित राष्ट्र बनाने के लिये उनके बड़े प्रयासों के साथ ही युवाओं के अनन्त ऊर्जा को जागृत करने के लिये यह बहुत अच्छा तरीका है।

स्वामी विवेकानन्द : एक संक्षिप्त जीवन परिचय

स्वामी विवेकानंद का जन्म 12 जनवरी 1863 को कोलकाता में हुआ था। उनका असली नाम

नरेन्द्रनाथ दत्त था। वे एक समृद्ध और शिक्षित परिवार में पैदा हुए थे, जिसके कारण उन्हें बचपन से ही अच्छे संस्कार और शिक्षा प्राप्त हुई। उनके पिता, विश्वनाथ दत्त, एक प्रतिष्ठित वकील थे और मां भुवनेश्वरी देवी एक धार्मिक और अत्यंत सरल स्वभाव की महिला थीं। स्वामी विवेकानंद का पालन–पोषण एक ऐसे वातावरण में हुआ, जो धार्मिकता, आध्यात्म, और उच्च संस्कारों से भरा हुआ था। उनके माता–पिता ने उन्हें बहुत अच्छे संस्कार दिए और छोटी उम्र में ही स्वामी विवेकानंद में गहरी धार्मिक भावना और अध्ययन की इच्छा देखने को मिली।

स्वामी विवेकानंद की प्रारंभिक शिक्षा कलकत्ता के ईश्वर चन्द्र विद्यासागर के मेट्रोपोलियन इंस्टियूशन से शुरू हुई, जहां उनकी शिक्षा का आधार मजबूत हुआ। वे एक मेधावी छात्र थे, और वे विद्यालय में हर विषय में उत्कृष्टता प्राप्त की। वे विशेष रूप से इतिहास, संस्कृत और दर्शनशास्त्र में रुचि रखते थे। उनकी धार्मिकता के प्रति रुचि और ज्ञान की प्यास इतनी गहरी थी कि वे अक्सर अपने गुरु से या अपने साथियों से जीवन के गूढ़ रहस्यों के बारे में सवाल पूछा करते थे। उनकी इसी जिज्ञासा ने उन्हें जल्द ही एक खोजी और ज्ञानवर्धक मार्ग पर ले जाने का कार्य किया।

स्वामी विवेकानंद का मननशील और विचारशील स्वभाव उन्हें सामान्य बच्चों से अलग करता था। वे एक समय में दो अलग–अलग तरह की मानसिकता रखते थे, एक तरफ वे धार्मिक गुरुओं की शिक्षाओं को गहराई से समझने की कोशिश करते थे, तो दूसरी ओर वे पश्चिमी विचारधारा और विज्ञान के प्रति भी गहरी रुचि रखते थे। जब वे रामकृष्ण परमहंस से मिले, तब उनके जीवन में एक महत्वपूर्ण मोड़ आया। स्वामी विवेकानंद ने रामकृष्ण परमहंस से शिक्षा ली और उनके दर्शन को आत्मसात किया। यही वह समय था जब वे अपने जीवन के उद्देश्य और मार्ग पर स्पष्ट रूप से अग्रसर हुए।

स्वामी विवेकानंद के बचपन और युवावस्था में ही उनके मन में भारतीय संस्कृति और समाज की बेहतरी के लिए एक जुनून और प्रतिबद्धता पैदा हो गई थी। उन्होंने अपने जीवन के पहले दिनों में ही समाज में व्याप्त अंधविश्वास, भेदभाव और सामाजिक असमानता के खिलाफ आवाज उठाना शुरू कर दिया था। उनका यह मानना था कि भारतीय समाज को पुनः जागृत करने और उसे अपनी पुरानी महानता की ओर वापस लौटने की जरूरत है।

25 वर्ष की अवस्था में नरेंन्द्र दत्त ने गेरूआ वस्त्र पहन लिए। तत्पश्चात उन्होंने पैदल ही पूरे भारतवर्ष की यात्रा की। सन् 1983 में शिकागो (अमेरिका) के विश्व धर्म सम्मेलन में स्वामी विवेकानन्द भारत के प्रतिनिधि के रूप में पहुंचे। यूरोप–अमेरिका के लोग उस समय पराधीन भारतवासियों को बहुत हीन दृष्टि से देखते थे। वहां लोगों ने बहुत प्रयत्न किया कि स्वामी विवेकानन्द को सर्वधर्म परिषद् में बोलने का समय ही न मिले परन्तु एक अमेरिकन प्रोफेसर के प्रयास से उन्हें थोड़ा समय मिला किंतु उनके विचार सुनकर सभी विद्वान चकित हो गए। मात्र यह पाँच शब्द 'मेरे अमेरिकावासी बहनों तथा भाइयों' कहकर स्वामी जी ने जब अपना उद्‌बोधन

प्रारम्भ किया तब विश्व धर्म महासभा का वह हॉल तालियों से गूँज उठा तथा भारत की आध्यात्मिक शक्ति से पूरा विश्व परिचित हुआ। फिर तो अमेरिका में उनका बहुत स्वागत हुआ। वहां इनके भक्तों का एक बड़ा समुदाय निर्मित हो गया। तीन वर्ष तक वे अमेरिका रहे और वहां के लोगों को भारतीय तत्वज्ञान की अद्‌भुत ज्योति प्रदान करते रहे।

'अध्यात्म – विद्या और भारतीय दर्शन के बिना विश्व अनाथ हो जायेगा' यह स्वामी विवेकानन्द का दृढ़ विश्वास था। अमेरिका में उन्होंने रामकृष्ण मिशन की अनेक शाखाएं स्थापित कीं। अनेक अमेरिकन विद्वानों ने उनका शिष्यत्व ग्रहण किया। वे सदा अपने को गरीबों का सेवक कहते थे। भारत के गौरव को देशदेशान्तरों में उज्ज्वल करने का उन्होंने सदा प्रयत्न किया। 4 जुलाई सन् 1902 को स्वामी जी का देहावसान हो गया।

स्वामी विवेकानन्द अपने शब्द ज्ञान और जीवन के व्यावहारिक पाठों से इतने समृद्ध थे कि प्रसिद्ध विद्वान और नोबेल पुरस्कार विजेता रवीन्द्रनाथ टैगोर ने एक बार कहा था 'यदि आप भारत को जानना चाहते हैं, तो विवेकानन्द का अध्ययन करें, उनमें सब कुछ सकारात्मक है और कुछ भी नकारात्मक नहीं है।'

इस प्रकार, स्वामी विवेकानंद का प्रारंभिक जीवन ज्ञान की खोज, समाज के प्रति संवेदनशीलता और उच्च आदर्शों की ओर एक यात्रा के रूप में विकसित हुआ, जो उनके बाद के जीवन में व्यापक रूप से परिलक्षित हुआ। स्वामी विवेकानंद को भारत के महान आध्यात्मिक गुरु और विचारक के रूप में जाना जाता है। उन्होंने युवाओं को राष्ट्र निर्माण के लिए प्रेरित किया। विवेकानंद के विचार और आदर्श आज भी प्रासंगिक हैं और लाखों युवाओं को दिशा देते हैं।

स्वामी विवेकानन्द द्वारा लिखित कुछ महत्वपूर्ण पुस्तकें

- Karma Yoga (1896)
- Raja Yoga (1896)
- Vedanta Philosophy:An address before the Graduate Philosophical Society (1896)
- Lectures from Colombo toAlmora (1897)
- Gyan Yog 1899
- Vedanta philosophoy: lectures on Jnana Yoga (1902)

स्वामी विवेकानंद के कुछ महत्वपूर्ण विचार–

- 'उठो, जागो और तब तक मत रुको जब तक लक्ष्य प्राप्त न हो जाए।'
- 'जब तक तुम खुद पर विश्वास नहीं करोगे, तब तक तुम कुछ नहीं कर सकते।'
- 'युवाओं में लोहे जैसी मांसपेशियां और फौलादी नसें हैं, जिनका हृदय वज्र तुल्य संकल्पित

है।'

- ➢ 'सबसे बड़ा धर्म है अपने स्वभाव के प्रति सच्चा होना।'
- ➢ 'जो कुछ भी तुम्हारे लिए बेहतर है, उसके लिए हमेशा काम करो।'
- ➢ 'जीवन बहुत छोटा है, लेकिन आत्मा अजर अमर है।'
- ➢ 'समाज के सबसे कमजोर तबके की सेवा करो।'
- ➢ 'जिस काम का संकल्प करो, उस काम को उसी समय पूरा करो।'

वास्तव में स्वामी विवेकानन्द आधुनिक मानव के आदर्श प्रतिनिधि हैं। विशेषकर भारतीय युवकों के लिए स्वामी विवेकानन्द से बढ़कर दूसरा कोई नेता नहीं हो सकता। इन्होंने हमें कुछ ऐसा संचार भर देने वाला संदेश दिया है जो हममें अपने उत्तराधिकार के रूप में प्राप्त परम्परा के प्रति एक प्रकार का अभिमान जगा देता है। स्वामी जी ने जो कुछ भी लिखा है वह हमारे लिये हितकर है तथा वह आने वाले लम्बे समय तक हमें प्रभावित करता रहेगा। प्रत्यक्ष या परोक्ष रूप में उन्होंने वर्तमान भारत को दृढ़ रूप से प्रभावित किया है। भारत की युवा पीढ़ी स्वामी विवेकानन्द से निःसृत होने वाले ज्ञान, प्रेरणा एवं तेज के स्त्रोत से लाभ उठा सकती है।

स्वामी विवेकानन्द जी का युवाओं को संदेश

स्वामी विवेकानन्द का नाम आते ही एक ऐसे तेजस्वी युवा सन्यासी की छवि मन में उभरती है जो न केवल ज्ञान के अथाह भंडार थे, बल्कि वे महान देशभक्त भी थे। उन्होंने भारत को ही अपनी माँ समझा था और इसी के उत्थान के लिए जीवन भर प्रयत्नशील रहे। स्वामी जी ने 11 सितम्बर 1893 को अमेरिका के शिकागो में आयोजित विश्वधर्म सम्मेलन में भारत की विजय पताका फहराई और यह सिद्ध किया कि विश्व में अगर कोई देश विश्वगुरू है, तो वह भारत ही है। उन्होंने वेदों की आधुनिक संदर्भ में व्याख्या की और उनके व्याख्यान आज भी निराश लोगों के दिलों में नई ऊर्जा भर देते हैं। मेरा मानना है कि युवा शक्ति देश और समाज की रीढ़ होती है। युवा देश और समाज को नए शिखर पर ले जाते हैं। युवा देश का वर्ममान हैं, तो भूतकाल और भविष्य के सेतु भी हैं। युवा देश और समाज के जीवन मूल्यों के प्रतीक हैं। युवा गहन ऊर्जा और उच्च महत्वाकांक्षाओं से भरे हुए होते हैं। उनकी आंखों में भविष्य के इंद्रधनुषी स्वप्न होते हैं। समाज को बेहतर बनाने और राष्ट्र के निर्माण में सर्वाधिक योगदान युवाओं का ही होता है। देश के स्वतंत्रता आंदोलन में युवाओं ने अपनी शक्ति का परिचय दिया था। परन्तु देखने में आ रहा है कि युवाओं में नकारात्मकता जन्म ले रही है। उनमें धैर्य की कमी है। वे हर वस्तु अति शीघ्र प्राप्त कर लेना चाहते हैं। वे आगे बढ़ने के लिए कठिन परिश्रम की बजाए लघुमार्ग खोजते हैं। भोग विलास और आधुनिकता की चकाचौंध उन्हें प्रभावित करती है। उच्च पद, धन–दौलत और ऐश्वर्य का जीवन उनके आदर्श बन गए हैं। अपने इस लक्ष्य को प्राप्त करने में जब वे असफल हो जाते हैं, तो उनमें चिड़चिड़ापन आ जाता है। कई बार वे मानसिक तनाव का भी शिकार हो जाते

हैं युवाओं की इस नकारात्मकता को सकारत्मकता में परिवर्तित करना होगा। उन्हें स्वामी विवेकानन्द से प्रेरणा लेनी होगी।

स्वामी विवेकानन्द ने युवाओं का आह्वान करते हुए कठोपनिषद का एक मंत्र कहा था– **'उत्तिष्ठत जाग्रत प्राप्य वरान्निबोधत।'** अर्थात उठो, जागो और तब तक मत रूको, जब तक कि अपने लक्ष्य तक न पहुंच जाओ।

स्वामी विवेकानन्द का कहना है कि बहती हुई नदी की धारा ही स्वच्छ, निर्मल तथा स्वास्थ्यप्रद रहती है। उसकी गति अवरूद्ध हो जाने पर उसका जल दूषित व अस्वास्थ्यकर हो जाता है। नदी यदि समुद्र की ओर चलते–चलते बीच में ही अपनी गति खो बैठे, तो वह वहीं पर आबद्ध हो जाती है। प्रकृति के समान ही मानव समाज में भी एक सुनिश्चित लक्ष्य के अभाव में राष्ट्र की प्रगति रूक जाती है और सामने यदि स्थिर लक्ष्य हो, तो आगे बढ़ने का प्रयास सफल तथा सार्थक होता है। हमारे आज के जीवन के हर क्षेत्र में यह बात स्मरणीय है। विशेषकर आज के युवा वर्ग को, जिसमें देश का भविष्य निहित है और जिसमें जागरण के चिह्न दिखाई दे रहे हैं, हमें अपने जीवन का एक उद्देश्य ढूँढ लेना चाहिए। हमें ऐसा प्रयास करना होगा ताकि हमारे भीतर जगी हुई प्रेरणा तथा उत्साह ठीक पथ पर संचालित हो। अन्यथा शक्ति का ऐसा अपव्यय या दुरूपयोग हो सकता है कि जिससे मनुष्य की भलाई के स्थान पर बुराई ही होगी।

स्वामी विवेकानंद ने कहा है कि ''भौतिक उन्नति तथा प्रगति अवश्य ही वांछनीय है, परन्तु देश जिस अतीत से भविष्य की ओर अग्रसर हो रहा है, उस अतीत को अस्वीकार करना निश्चय ही निर्बुद्धिता का द्योतक है। अतीत की नींव पर ही राष्ट्र का निर्माण करना होगा। युवा वर्ग में यदि अपने विगत इतिहास के प्रति कोई चेतना न हो, तो उनकी दशा प्रवाह में पड़े एक पतवार विहीन नाव के समान होगी। ऐसी नाव कभी अपने लक्ष्य तक नहीं पहुँचती।" इस महत्वपूर्ण बात को सदैव स्मरण रखना होगा।

स्वामी जी ने कहा है कि ''मान लो हम लोग आगे बढ़ते जा रहे हैं, पर यदि हम किसी निर्दिष्ट लक्ष्य की ओर नहीं जा रहे हैं, तो हमारी प्रगति निष्फल रहेगी। आधुनिकता कभी – कभी हमारे समक्ष चुनौती के रूप में आ खड़ी होती है। इसलिए भी यह बात हमें विशेष रूप से याद रखनी होगी। इसी उपाय से आधुनिकता के प्रति वर्तमान झुकाव को देश के भविष्य के लिए उपयोगी एक लक्ष्य की ओर सुपरिचालित किया जा सकता है।"

स्वामी जी ने बताया है कि उन्नति की प्रथम सीढ़ी स्वाधीनता है। स्वाधीनता के अभाव में हम बद्ध हो जाते हैं और इससे क्रमशः हमारा विनाश अवश्यंभावी हो जाता है। इसीलिए युवकों को पूर्ण स्वाधीनता देनी होगी, उनके पथ निर्धारण में सहायता भी करनी होगी। स्वामी जी सर्वप्रथम युवाओं को उनके यथार्थ स्वरूप का परिचय करवाते हैं। उनकी विराट आध्यात्मिक पृष्ठभूमि का परिचय देते हुए स्वामी जी ओजस्वी शब्दों में कहते हैं– "हे युवाओं! तुम सर्वशक्तिमान की सन्तानें हों। तुम अनन्त दिव्य अग्नि की चिंगारिया हो।" इस आध्यात्मिक परिचय के साथ ही वे युवाओं

का जीवन लक्ष्य स्पष्ट करते हुए कहते हैं कि हर आत्मा मूल रूप में देवस्वरूप है और लक्ष्य इस दिव्यता को जगाना है। इस तरह स्वामी जी मनुष्य की अन्तर्निहित पूर्णता को जाग्रत करने और जीवन के हर क्षेत्र में इसकी अभिव्यक्ति को सर्वोच्च लक्ष्य घोषित करते हैं।

लक्ष्य के एक बार निर्धारित होते ही फिर इसके अनुरूप युवाओं के जीवन का गठन शुरू हो जाता है। स्वामी जी के अनुसार – लक्ष्य के अभाव में हमारी 99 प्रतिशत शक्तियाँ इधर–उधर बिखर कर नष्ट होती रहती है। आध्यात्मिक आदर्श के अभाव में हम अपनी अन्तर्निहित दिव्यता एवं पूर्णता को भुलाकर देह–मन तक ही अपना परिचय मान बैठते हैं और हमारे समस्त दुःख, कष्टों और विषाद का मूल कारण यह आत्म विस्मृति ही है। स्वामी जी के शब्दों में – ''यह अज्ञान ही सब दुख – बुराइयों की जड़ है। इसी कारण हम स्वयं को पापी, दीन–हीन और दुष्ट–दरिद्र मान बैठे हैं और दूसरों के प्रति भी ऐसी ही धारणाएं रखते हैं तथा इसका एकमात्र समाधान अपनी दिव्य प्रकृति एवं आत्मशक्ति का जागरण है। वह जोर देते हुए कहते हैं कि आध्यात्मिक और मात्र आध्यात्मिक ज्ञान ही हमारे दुखों मुसीबतों को सदैव के लिए समाप्त कर सकता है।"

इस तरह युवाओं के आध्यात्मिक पथ का निर्देशन करते हुए स्वामी जी कहते हैं कि ''जब समस्त शक्ति, समस्त समस्याओं के समाधान का स्त्रोत तुम्हारे अन्दर विद्यमान है, तो फिर सुख भोगों और उपलब्धियों के पीछे यह अन्तहीन भटकाव कैसा ? कोल्हू के बैल की तरह न जाने तुम कितने जन्मों से इसी तरह बिना कुछ पाये भटक रहे हो और इन्द्रिय सुख एवं भोगों की इस अन्धी दौड़ का कोई अन्त भी नहीं। अस्तित्व की पूरी आहुति देने पर भी यह आग संतुष्ट होने वाली नहीं।"

युवाओं की इस अंतहीन भटकन को हृदय की गहराई से अनुभव करते हुए स्वामी जी अपने अमृत वचनों द्वारा थके–हारे संतप्त युवा मन में शक्ति का संचार करते हैं और वे कहते हैं – ''मैं जानता हूँ मार्ग बहुत कठिन है, किन्तु यदि तुम्हारे अन्दर आदर्श की अग्नि प्रदीप्त है तो चिंता की कोई बात नहीं। ऐसे में मार्ग की असफलताएँ ! इनकी परवाह मत करो। अरे! वे तो स्वाभाविक हैं और वे तो जीवन का सौन्दर्य हैं। जीवन के इस संग्राम में धूल–मिट्टी का उड़ना तो स्वाभाविक ही है और जो इस धूल को सहन नहीं कर सकता, वह आगे कैसे बढ़ सकेगा। ये असफलताएँ तो सफलता के मार्ग की अनिवार्य सीढ़ियाँ हैं। मेरा दृढ़ विश्वास है कि यदि कोई व्यक्ति आदर्श के साथ एक हजार गलतियाँ करेगा तो बिना आदर्श के वह पचास हजार गलतियाँ करेगा। इसलिए जीवन में आदर्श का होना आवश्यक है। अतः जीवन का आदर्श कभी मत छोड़ना" एक जगह तो स्वामी जी यहाँ तक कहते हैं कि गलत रास्ते पर तेजी से बढ़ने की बजाय अच्छे मार्ग पर डटे रहकर खड़े होना भी पर्याप्त है।

इसी क्रम में स्वामी जी युवाओं को जागृत करते हुए कहते हैं – ''तुम अपने दोषों एवं गलतियों के लिए दूसरों को दोष क्यों देते हो? जो तुमने बोया था, वही तो काट रहे हो। इसलिए भाग्य को क्या दोष दें ? दूसरों पर दोषारोपण हमें दुर्बल और सिर्फ दुर्बल ही बनाता है। अतः किसी को

अपनी दुर्बलता के लिए दोष मत दो। सारी जिम्मेदारी अपने कन्धे पर लो। कहो – यह जो कष्ट मैं झेल रहा हूँ यह मेरा रचा हुआ है। इसका अर्थ हुआ कि इसे मैं ही नष्ट कर सकता हूँ। जो मैंने खड़ा किया है उसे मैं ही ध्वस्त भी कर सकता हूँ। अतः अपने पैर पर खड़े हो, बहादुर बनो, दृढ़ बनो तथा अपनी सारी जिम्मेदारी अपने कन्धों पर लो और जानों कि अपने भाग्य के निर्माता तुम स्वयं हो। समस्त शक्तियाँ और सफलताएँ तुम्हारे भीतर हैं। भूत यदि गरिमामय नहीं रहा तो इसकी चिंता मत करो। मरे हुए भूत को भूत के हवाले दफन के लिए छोड़ दो। अनन्त भविष्य तुम्हारे सामने है और तुम्हें सदैव स्मरण रखना होगा कि प्रत्येक शब्द, प्रत्येक विचार और प्रत्येक कर्म तुम्हारे लिए संग्रहित रहेगा। जैसे बुरे विचार और कर्म खूंखार शेर की भाँति तुम पर झपटने के लिए सदा आतुर रहेंगे, वैसे ही अच्छे विचार और कर्मों की शक्ति भी हजारों देवदूतों के समान तुम्हारी रक्षा के लिए सदैव तत्पर रहेगी।"

इस तरह स्वामी जी युवाओं को अपनी जिम्मेदारी स्वयं लेने का आह्वान करते हैं और इसमें निहित आत्म शक्ति के जागरण का मर्म बोध करवाते हुए उद्‌बोधन करते हैं– ''तभी व्यक्ति का श्रेष्ठतम स्वरूप उभर कर आता है, जब वह अपने दायित्व के प्रति पूर्णरूप से जिम्मेदारी का बोध करता है। जब हमारे सामने कोई भूत–प्रेत दोष देने के लिए नहीं है, कोई देवता हमारा बोझ उठाने वाला नहीं है, तब हम स्वयं अकेले ही जिम्मेदार होते हैं, तभी हम अपने श्रेष्ठतम रूप में सामने आते हैं और अपनी सम्भावनाओं के उच्चतम शिखरों की ओर आरोहण करते हैं।"

इस तरह स्वामी जी युवाओं में उत्तरदायित्व का बोध जगाकर सहज ही उनके आध्यात्मिक जागरण एवं चरित्र गठन की ठोस पृष्ठभूमि तैयार करते हैं। यह बोध जहाँ युवाओं को अवाँछनीय विचारों और कर्मों से बचाता है, वहीं उनको श्रेष्ठ चिंतन व आचरण के लिए प्रेरित करता है और अपने भाग्य निर्माता आप होने का एक नया विश्वास जगाता है। इसके साथ ही युवाओं के चरित्र निर्माण और व्यक्तित्व गठन की आध्यात्मिक प्रक्रिया शुरू हो जाती है।

स्वामी जी के शब्दों में– व्यक्ति का चरित्र और कुछ नहीं बल्कि उसकी आदतों और वृत्तियों का सार भर है। हमारी आदतें और वृत्तियां ही हमारे चरित्र का स्वरूप निर्धारित करती है। वृत्तियों की श्रेष्ठता और निकृष्टता के अनुरूप ही चरित्र की सबलता और निर्बलता सुनिश्चित होती है। श्रेष्ठ चिंतन और आचरण के सतत् अभ्यास द्वारा वृत्तियों का शोधन होता है और चरित्र गठन का कार्य मनोवांछित दिशा में आगे बढ़ता है।

वास्तव में आध्यात्मिक पूर्णता की अनन्तता एवं असीमता को इस सानन्त एवं ससीम जीवन में मूर्त रूप देने का दुस्साहस भरा प्रयास – पुरूषार्थ ही चरित्र का गठन का मर्म है। स्वामी जी के शब्दों में इससे कम नैतिकता या आदर्श के मार्ग को अपनाना सम्भव भी नहीं है। इससे कम में युवाओं के हृदय को उद्वेलित कर रहे प्रश्नों का यथार्थ समाधान भी सम्भव नहीं है। क्योंकि कोरे उपयोगितावादी आधार पर किसी तरह नैतिकता की व्याख्या सम्भव नहीं है। क्योंकि उपयोगितावादी दर्शन मात्र अपने सुख और स्वार्थ को देखता है। इसकी दृष्टि में सेवा, संयम

और त्याग का मार्ग प्रत्यक्षतः घाटे का ही सौदा जान पड़ता है। स्वामी जी इस संदर्भ में कटाक्ष करते हुए कहते है कि उपयोगितावादी अर्थात् भोगवादी दर्शन एक ओर तो अनन्त अर्थात् आध्यात्मिक पूर्णता के आदर्श को असम्भव मानता है तथा इसके लिए संघर्ष करने से रोकता है और दूसरी और नैतिकता की वकालत करता है; जो स्वामी के शब्दों में सम्भव नहीं है। बिना आध्यात्मिक आदर्श के नैतिक या अच्छा बनना स्वयं में लक्ष्य नहीं हो सकता। मात्र अनन्त की ओर अर्थात् अपनी आध्यात्मिक परिपूर्णता की ओर बढ़ने के जीवन आदर्श के आधार पर ही यथार्थ नैतिकता सम्भव है।

श्रेष्ठ चिंतन व आचरण के रूप में जिस चरित्र गठन का शुभारम्भ होता है, वही चित्तवृत्तियों के शोधन के साथ तप साधना का रूप ले लेता है। वृत्तियों के शोधन के साथ क्रमशः आत्मा में निहित शक्तियों का जागरण शुरू हो जाता है। इस क्रम में संयम, सहिष्णुता, नैतिकता व अन्य नीति–नियम, मार्ग के अनिवार्य सोपान बनते जाते हैं। अब युवाओं को अपने अनुत्तरित प्रश्नों के समाधान सहज ही मिलने लगते हैं। क्षणिक सुख का थोड़ा सा संयम आन्तरिक सशक्तता एवं आनन्द की एक गहरी अनुभूति देता है। स्वार्थ को थोड़ा सा त्याग, अन्दर गहरे संतोष का अनुभव बनता है। इसी क्रम में संयम, सहिष्णुता, उदारता, सेवा आदि सद्गुण जीवन के अभिन्न अंग बनते जाते हैं। जीवन में नैतिक नीति –नियमों का पालन बाह्य दबाव की बजाय अन्दर से स्फूर्त होने लगता है। जीवन के क्रियाकलाप बाहरी अनुशासन के बजाय आत्मानुशासन द्वारा संचालित होने लगते हैं।

अपने अन्दर दिव्यता की हल्की सी झलक भी युवा हृदय को अन्तर्निहित अपार सम्भावनाओं के प्रति आश्वस्त करती है और इसके साथ ही बाहर दूसरे व्यक्तियों एवं प्राणियों में भी इसकी झलक झाँकी प्रतिभासित होने लगती है। इसी बिन्दु पर स्वामी के अनुसार 'शिवभावे जीव सेवा' का रहस्य उद्घाटित होता है। स्वामी जी लिखते हैं कि– "इतनी तपस्या के बाद मैं इस वास्तविक सच्चाई को समझ पाया हूँ कि ईश्वर हर प्राणी में है। जो जीव सेवा करता है, वह ईश्वर सेवा करता है। जो इस प्रकट ईश्वर की सेवा नहीं कर सकते हो, उस अप्रकट ईश्वर की सेवा कैसे कर पाओगे। इसलिए वे कहते हैं कि प्रत्येक पुरूष, स्त्री और सभी प्राणियों को भगवान् के रूप में देखो। इनकी सेवा ही सर्वोच्च धर्म है।" आज के युवा यदि इन आदर्शों के अनुरूप अपना जीवन गढ़ने के लिए कटिबद्ध हो जायँ तो स्वामी जी के शब्दों में, फिर वे अधिक देर तक अन्धकार में नहीं भटकेंगे। आध्यात्मिक जीवन शैली के सतत् अभ्यास के साथ हमारे अन्तर से आत्म सूर्य का प्रकाश उदित होगा, जो शनैः–शनैः हमारे जीवन के अन्धेरे कोनों को प्रकाशित करेगा। इसी के साथ क्रमशः शक्ति का उद्भव होगा। जो अभी लड़खड़ा रहा है, वह धीरे–धीरे मजबूत होता जायेगा और शीघ्र ही वह दिन आयेगा जब सत्य हमारे दिलों –दिमाग पर इस कदर छा जायेगा कि वह हमारी धमनियों में से प्रवाहित होने लगेगा तथा हमारे जीवन से आचरण की भाषा में छलकने लगेगा।

उपर्युक्त आधार विकसित भारत 2047 के निर्माण की ओर इंगित करते हैं। जब युवा उच्च

आदर्शों, उद्देश्य की भावना और व्यापक ज्ञान से परिपूर्ण होते हैं, तो वे भलाई के लिए एक अजेय शक्ति बन जाते हैं। श्री बंडारू दत्तात्रेय लिखते हैं कि आज भारत ओजस्वी एवं यशस्वी प्रधानमंत्री श्री नरेन्द्र मोदी जी के दूरदर्शी, सशक्त एवं कुशल नेतृत्व में अपने इतिहास के एक महत्वपूर्ण मोड़ पर है, इसलिए युवाओं को एक महत्वपूर्ण भूमिका निभानी है। 21वीं सदी भारत की सदी होगी क्योंकि देश अपनी क्षमताओं के प्रति आश्वस्त होकर भविष्य की ओर तीव्रता से अग्रसर है। वर्ष 2047 तक भारत एक विकसित राष्ट्र की सभी विशेषताओं के साथ 30 ट्रिलियन अमेरिकी डॉलर की अर्थव्यवस्था बनने की ओर अग्रसर है। यह एक विकसित भारत होगा, जिसके लिए हमारे युवाओं को महत्वपूर्ण भूमिका निभानी होगी।

विज्ञान और प्रौद्योगिकी के क्षेत्र में, भारत ने चंद्रयान जैसे मिशनों के माध्यम से अंतरिक्ष अन्वेषण में अपनी शक्ति का प्रदर्शन करते हुए उल्लेखनीय उपलब्धियां हासिल की हैं। भारत के डिजिटल पब्लिक इंफ्रास्ट्रक्चर (DPI) ने आधार, UPI]AA स्टैक, COWIN प्लेटफॉर्म और GeM जैसी पहलों के साथ प्रधानमंत्री श्री मोदी जी की अनुकरणीय राजनीति के तहत वैश्विक मान्यता प्राप्त की है, जो डिजिटल नवाचार के लिए देश की प्रतिबद्धता को रेखांकित करता है। भारत एक वैश्विक विनिर्माण केंद्र बनने की दिशा में प्रगति कर रहा है, और इसने सेवा क्षेत्र, विशेष रूप से आईटी और गैर–आईटी डोमेन में वैश्विक प्रमुखता प्राप्त की है। राष्ट्र एक संपन्न स्टार्टअप पारिस्थितिकी तंत्र का दावा करता है, जो 340 बिलियन अमेरिकी डॉलर से अधिक के संयुक्त मूल्यांकन के साथ 100 से अधिक यूनिकॉर्न की मेजबानी करता है, जो खुद को दुनिया के तीसरे सबसे बड़े स्टार्टअप पारिस्थितिकी तंत्र के रूप में स्थापित है।

अतः अमृत काल के दौरान आत्मनिर्भर भारत बनाने के लिए स्वामी विवेकानन्द की शिक्षाओं और सिद्धांतों कोआचरण में समाहित करना पड़ेगा। हम 12 जनवरी को स्वामी विवेकानन्द की जयंती को राष्ट्रीय युवा दिवस के रूप में इसलिए मनाते हैं ताकि हम स्वामी जी के आदर्शों और उनके दर्शन के लिए, जिनके लिए वे जिए और काम किए, वे भारतीय युवाओं के लिए प्रेरणा का एक बड़ा स्रोत बन सकें। स्वामी जी के बताये रास्ते पर चलकर ही ''एक भारत सर्वश्रेष्ठ भारत" और भारत को विश्व गुरु बनाने का सपना साकार किया जा सकेगा। उनका दृढ़ विश्वास था कि सभी रास्ते एक ही सच्चे ईश्वर तक जाते हैं, जैसा कि ऋग्वेद में भी उल्लेख किया गया है कि ''एकम् सत विप्रा बहुदा वदन्ति" (सत्य एक है, बुद्धिमान इसे विभिन्न नामों से बुलाते हैं।) युवाओं को संकल्प लेना होगा कि वे स्वामी जी की शिक्षाओं और सिद्धांतों के सार को राष्ट्रीय भावना, देशभक्ति, विविधता में एकता, समावेशिता और पवित्रता को आत्मसात करें। यही स्वामी विवेकानन्द जी को हम सबकी तरफ से सच्ची श्रद्धांजलि होगी और 2047 तक विकसित भारत के निर्माण की दिशा में एक मील का पत्थर साबित होगा।

निष्कर्ष

समस्त तथ्यात्मक विश्लेषण के आधार पर कहा जा सकता है कि जहाँ भारत सरकार 2047 तक

विकसित भारत की संकल्पना को लेकर प्रतिबद्ध है वहीं युवाओं की भूमिका ही अद्वितीय है और युवाओं के प्रेरणास्त्रोत स्वामी विवेकानन्द की वैचारिकी महत्वपूर्ण। स्वामी विवेकानन्द जी युवा वर्ग को अतीत की नींव के समान मानते हैं। अतीत की नींव के बिना सुदृढ़ भविष्य का निर्माण नहीं हो सकता। अतीत की जीवन शक्ति ग्रहण करके ही भविष्य जीवित रहता है। जिस आदर्श को लेकर राष्ट्र अब तक बचा हुआ है, उसी आदर्श की ओर वर्तमान युवा पीढ़ी को परिचालित करना होगा, ताकि वे देश के महान अतीत के साथ सामंजस्य बनाकर लक्ष्य की ओर अग्रसर हो सकें। स्वामी जी ने कहा है कि युवा वर्ग के सम्मुख एक लक्ष्य स्थापित करना होगा और इस ओर ध्यान देना होगा कि युवक उत्साह तथा प्रेरणा के साथ अपनी क्षमता का सदुपयोग कर सकें।

युवा शक्ति के भीतर जो सक्रियता एवं उद्दाम भावावेग देखने में आता है, उसकी उपेक्षा नहीं की जा सकती। वे कुछ करने को उत्सुक हैं और यह उसी का लक्षण है। उनके नेतृत्व का भार जिनके ऊपर है, उन वयस्क लोगों को इस विषय में सोचना होगा। युवकों को केवल निधि – निषेध की सीमा में आबद्ध न रखकर, उन्हें स्पष्ट मार्ग दिखाना होगा। इसीलिए तरूणों के प्रति स्वामीजी का आह्वान है – अपनी शक्ति को व्यर्थ बरबाद न होने देना। अतीत की ओर देखो, जिस अतीत ने तुम्हें अनंत जीवन रस प्रदान किया है, उससे पुष्ट हो। यदि अतीत की परम्परा का सदुपयोग कर सको, उसके लिए गौरव का बोध कर सको, तो फिर उसका अनुसरण कर अपना पथ निर्धारित करो। वह परम्परा तुम्हें दृढ़ नींव पर प्रतिष्ठित करेगी और इसके फलस्वरूप तुम देखोगे कि देश सामंजस्यपूर्ण समृद्धि की दिशा में अग्रसर हो रहा है।

इसी प्रकार अपेक्षाकृत अत्यल्प समय के भीतर लक्ष्य तक पहुँचा जा सकेगा। वैज्ञानिकगण नए–नए उपायों के खोज में तरह–तरह के परीक्षण– निरीक्षण किया करते हैं, परन्तु वे भी क्या उत्तराधिकार के रूप में प्राप्त अतीत काल की प्रज्ञा पर निर्भर नहीं करते ? अणु का आविष्कार आकस्मिक रूप से नहीं हो गया। अनेक युगों के अनेक वैज्ञानिकों की जी–तोड़ खोजों के बाद अंततः वर्तमान शताब्दी में आण्विक शक्ति के अस्तित्व का पता चला है। उसी प्रकार इस क्षेत्र में भी हमें अपने पूर्ववर्तियों के प्रयास को स्मरण रखना होगा।

स्वामी जी ने यह भी बताया है कि उन्नति की प्रथम सीढ़ी स्वाधीनता है। स्वाधीनता के अभाव में हम बद्ध हो जाते हैं और इससे क्रमशः हमारा विनाश अवश्यंभावी हो जाता है। इसीलिए युवकों को पूर्ण स्वाधीनता देनी होगी, परन्तु इसके साथ ही उनके पथ के निर्धारण में सहायता भी करनी होगी, साथ ही युवकों को केवल स्वामी जी की यह चेतावनी याद रखने की आवश्यकता है कि वे युगों से संचित अनुभवों के भंडार से दृष्टांत लेकर लाभ उठाएँ और भारत को विकसित राष्ट्र बनाने में अपनी सम्पूर्ण ऊर्जा का संचार करें तथा सही मायने में यही स्वामी जी के प्रति सच्ची श्रद्धांजलि होगी और इस महान उत्तराधिकार को स्वीकार करना युवाओं का परम सौभाग्य।

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Book Review

Transformation of Survey of India (2023), by Dr Prithvish Nag,
former Surveyor General of India

Ethics International Press, Cambridge & New Castle, Price 90 British Pounds. Order online: www.ethicspress.com; Discount code: INTEGRITY33. Pages 340.

The Survey of India was established as the Survey of Bengal in 1767 and has since become one of the longest-standing scientific organisations in the world. For more than 250 years, it has made significant contributions to surveying and mapping, as well as to the broader fields of geography, geology, and earth sciences. Mount Everest, the world's highest peak, was named after Sir George Everest, who served as Surveyor General of India from 1830 to 1843. The author held the position of Surveyor General of India from 2001 to 2005, marking the first time a geographer occupied this historic role. During this period, a major initiative was undertaken to transform the organization.

The book under review details the changes and initiatives during this transformative phase, including the reorganization of the nationwide setup, the introduction of dual map series under the National Map Policy of 2005, the establishment of the National Spatial Data Infrastructure, and enhancements in field operations and geodesy. This included the scientific study of topographical changes following the 2004 tsunami. This era was marked by significant scientific advancements. This unique book addresses a wide range of topics related to the survey, including geography, geology, forestry, military science, civil engineering, geospatial technology, architecture, environment, and ecology. The history of the Survey of India is closely intertwined with the history of India itself, making this book particularly interesting for historians.

The period from 1802 onwards is known for the Great Trigonometrical Survey (GTS), which began in Madras, now Chennai, and laid the foundational groundwork for the Indian cartographic empire. According to the author, this book will be remembered for its focus on the Great Digital Transformation initiatives, which aimed to transition from conventional to digital mapping techniques. Additionally, this book holds significance as it is the first time an Indian author has written a comprehensive work on the Survey of India. Previously, the organisation was primarily understood through the lens of Western authors. This book functions as a valuable time capsule. While the book is essential for cartographers, geographers, historians, and GIS experts, its high cost has made it less accessible to these audiences. However, there are hopes for the release of more affordable versions, like paperback and Kindle editions, shortly.

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Belda College (Vidyasagar University)
Belda. West Bengal.

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