JOURNAL

Journal of
Education
&
Pedagogy

A Peer Reviewed Refereed International Research Journal

Volume XIII   **No.2**   **Dec. 2021**

NATIONAL EDUCATIONIST COUNCIL

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CONTENTS

FUNDAMENTAL DUTIES OF INDIAN CITIZEN

- To abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;
- To cherish and follow the noble ideals which inspired our national struggle for freedom;
- To uphold and protect the sovereignty, unity and integrity of India;
- To defend the country and render national service when called upon to do so;
- To promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;
- To value and preserve the rich heritage of our composite culture;
- To protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures;
- To develop the scientific temper, humanism and the spirit of inquiry and reform;
- To safeguard public property and to abjure violence;
- To strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavor and achievement.

Ethical Issues in University Students' Behaviors: Beliefs and Practices of Bangladeshi Students

Najnin Jahan* & Md. Serazul Islam**

ABSTRACT

The degree of unethical activities by university students is increasing day by day. Taking it as a matter of important concern, the present study measures the extent to which Bangladeshi university students believe their behaviors as ethical and how often they practice those. The students' rating for each of the selected 28 behaviors was measured on a five-point Likert scale. 270 students of six universities participated in this study who were selected randomly and given a questionnaire to fill up and return to us instantly at their respective university campuses. Regarding the selected students' beliefs and practices on their ethical behaviors in and outside the classroom, the results indicate that 'intentionally irritating the teachers and making fun with them by mimicking their voice', and 'walking in and out the classroom during the class hour' are believed as the most unethical but are rarely practiced behaviors. On the examination related and other issues, the extreme unethical behaviors as believed by the most sample students are 'making misbehavior with invigilators and cheating in the examination hall' and 'willful damage of university property'. The frequency with which the students practice their believed unethical behaviors dominates the never-done alternative. That is, with few exceptions, the beliefs of most students on their ethical behaviors are reflected in their practices.
Key words: University students, ethical beliefs, and behaviors

Introduction

Ethics refers to a system or code of conduct that specifies how we must behave based on moral duties and obligations; it deals with identifying right from wrong and doing what is right. In other words, it is the system of rules that influences the ordering of values. As a general principle, ethics provides basic principles and guidelines that appropriately guide any activity. Rue and Byars (1980) in their study defined ethics as "standards or principles of conduct used to govern the behavior of an individual or group of individuals". The word ethics commonly "refers to principles of behaviors that distinguish between what is good, bad, right, and wrong" (Henderson, 1982). Right means the thing to which human beings are entitled to by law, morality, or tradition, such as "the right to life"

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or "the right to be free". Ethical issues that arise in the cases should be evaluated regarding the appropriate rules and standards of professional conduct. In most situations, the issues raised are not clear cut and, therefore, we will have to go beyond the rules and standards in analyzing the ethical issues. When someone or something is actually harmed or potentially harmed, ethical issues arise. An individual or group can suffer harm from an action or a planned action in the sense of being made worse off by it. Ethical issues also arise in situations in which there are actual or potential conflicts of interest. Conflicts may occur because individuals have divergent interests (Mintz, 1992). In the present study, ethical issues in educational institutions, particularly at the university levels, are mainly to be addressed at the student (learner) level. At this level, concerns are raised about the ethical dimensions of activities done by the students on the campus that affect the decisions of the teachers, students themselves, and others.

According to Bowers' study (1964), over five thousand students in a study of 89 college campuses admitted to engaging in different types of academic fraud including plagiarism, copying answers from other students during exams, consulting their notes during written exams, doing homework that the teacher indicated as individual work in collaboration with others, or lying to the teacher about their reasons for turning in papers past the deadline. McCabe and Trevino (1993) investigated a batch of 6,000 students in thirty-one academic campuses, with results similar to Bowers' study. Two out of three investigated individuals admitted to having taken an active part in

questionable behaviors during their academic years before the study. According to McCabe and Trevino (1993), a study of 6,000 students across thirty-one colleges and universities found results similar to Bowers'. Among the investigated individuals, two out of three admitted to cheating and abusing alcohol during their academic years before the study.

The study of Reed and Kirkpatrick (1998) highlights the issue of student misbehavior that ranging from frequent to infrequent, mild to severe is a thorny issue that involves disruptive talking, chronic avoidance of work, clowning, interrupting teaching activities, and harassing classmates. In addition to retreading smoothness and effectiveness of teaching, student misbehaviors impede learning for the students and those around them. Furthermore, the work of Bryant et al (2000) revealed that school misbehavior escalated over time, lowering academic achievement, and increasing delinquent behavior.

There are different levels of education in Bangladesh, such as primary, secondary, and higher secondary education. Education at universities is seen as a means to produce knowledgeable, responsible, and productive citizens within their communities, their nations, and the world. The university students' behavior must conform to the standards of ethics as expected by their professors, guardians, administrators, peers, etc. A clear demarcation line between ethical and unethical behavior or action needs to be drawn, but it is not an easy task. In academia, students are the ultimate customers and the main concern of stakeholders such as future employers,

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parents, and society. Therefore, actions would be considered unethical when the actions would directly or indirectly concern others. In this study, unethical actions are actions against the academic rules or code of conduct. The unethical actions may not be in any of the guidelines but if the actions will harm or give a negative impact, either little or enormous to other parties, it is generally understood that the actions are unethical. For example, 'using an electronic device during a teacher's lecture', 'asking irrelevant questions to teachers' may not be in the code of ethics, but when students do this, this commonly would not be accepted by the teachers. In the present study, we defined ethical issues in student behavior as those that involve breaking rules, violating implicit norms or expectations, being inappropriate in the classroom or examination hall, and disrupting teaching and learning, which required the intervention of teachers.

Literature Review and Significance of the Study

Miller (2000) argues that values are expressed in ethics. The purpose of higher education is to provide students with a value framework within which they can amend their views of the world. Institutional culture, including the degree to which institutions make ethical decisions, falls within this framework. In 1994, Theodore Hesburgh, former president of Notre Dame University, explained the importance of articulating a strong institutional vision through the development of a culture that is supportive of it (Johnson & Meyerson).

Grimes (2004) reported that more than 85 percent of the US students (40 percent of

the transitional economies students) believed that cheating in college/university is ethically wrong. But the study of Baired (1980) did not support this argument and found that 85 percent of students feel that cheating is a normal part of life and students are more accepting toward this through the supportive behavior of their peers. Grimes (2004) also concluded that 49 percent felt it was nevertheless acceptable which means that although academic dishonesty is an unethical practice they do it even knowing it. Harding (2001) also reported that 95 percent of students believe that they were less involved in cheating activities as compared to their peers. Based on Grime's study, the present study utilizes two categories(i) to measure whether the university students of Bangladesh consider their behaviors as ethical or unethical, and (ii) to measure whether they perform these behaviors even after knowing them as completely unethical. According to the report by Grimes (2004), more than 85 percent of US students (40 percent of those from transitional economies) believed that cheating in college/university is unethical. However, Baired's (1980) study did not support this argument and revealed that 85 percent of students feel cheating is normal and are more accepting of cheating as a phenomenon because of the supportive behavior of their peers. In addition, according to Grimes (2004), 49 percent of respondents believed it was nonetheless acceptable, indicating that academic dishonesty is an unethical practice that people do even though they are aware that it is wrong. According to Harding (2001), 95 percent of students believe that they are less likely to cheat than their peers. Based on

Grime's study, the present study examines two categories: (i) whether university students of Bangladesh consider their behaviors ethical or unethical, and (ii) whether they perform these behaviors regardless of knowing they are completely unethical.

The institution of higher education was founded with society as well, according to Altbach (1991). In this discussion, society refers to non-elite individuals. To put it another way, the work that these few talented individuals did ultimately revolved around identifying societal needs and solving the problems they faced. Traditionally, colleges and universities see value in addressing society's issues and needs. Is it really necessary to divert resources from the needs of society to entertain professional development programs for students? Does this address a need or problem for colleges and universities? The self-interest of institutions can be influenced by concrete data on beliefs and behaviors. Organizations, including colleges, can suffer from unethical behavior. Inappropriate conduct on university campuses can undermine public trust, damage the reputations of institutions, and result in the loss of funds (Trevino & Ball, 1992).

In Tehran, Khodaie, Moghadamzadeh, and Salehi (2011) identified the factors that were associated with academic cheating among school students across all regions. Considering 336 students, the results of the survey revealed a significant relationship between social and economic status, commitment to discipline and rules, and the history of cheating. Education level, age, formal study habits, and father's education all play an important role in motivating cheating,

according to the regression logistic analysis. Additionally, 95.6 percent of the students in their study confessed to cheating on their exams or homework during one academic year. In this regard, 95.8 percent of students have mentioned cheating they have witnessed performed by their friends, but when asked how many students cheat in general, they believed that 70 percent cheat during examinations. The reasons and motivations that students have given for cheating are presented in two parts; the first part includes samples' direct answers such as difficulty in the subject matter, or not taking the teacher seriously. These reasons are confirmed by statistical correlations and by the research study. They suggest a set of committees, research programs, and lectures to promote the standards during the academic year. In a survey of 392 students from two prominent Universities in the South, Bonjean and McGee (1965) found that 78 percent admitted to at least one dishonest act at their university.

Sun and Shek (2012) surveyed to identify the most problematic and problematic behaviors students engaged in at junior secondary schools in Hong Kong according to the views of teachers. To the end, they conducted twelve individual interviews with teachers, which led to a list of 17 student problem behaviors. They found that talking out of turn was a common and disruptive problem behavior, mainly related to discussions about irrelevant topics that disrupt the lesson or making comments about someone or something that students made without permission. Students are increasingly using electronic devices, such as mobile phones for texting, playing video games, searching the

web, or listening to music, as pointed out by some teachers. Among students' unacceptable problem behaviors, disrespect towards teachers was the most prevalent. Students disobeyed, were rude, talked back, and confronted teachers. In their study, students reported teasing, attacking, quarreling, and using foul language with classmates, sleeping, changing seats purposefully, wandering around classrooms, catching, and running out of the classroom without permission as common school misconduct behaviors.

To identify unethical behaviors of students at one of the main Romanian university centers, Iorga, Ciuhodaru, and Romedea (2013) surveyed 369 students across various institutions of higher education in Romania. Approximately 70 percent of students engage in unethical behavior according to the results of the study. Among them these behaviors are worth mentioning: writing an academic paper under the name of another student (9.15 percent), visiting a teacher or his family after an exam to influence him (4.0 percent), lying to the teacher about the reason for turning in a paper past its deadline (7.5 percent), illegal access to computer databases (1.1 percent), sabotaging lab experiments (1.9 percent), buying academic essays, papers, etc. (4.2 percent), offering "gifts" to teaching staff in cases of exam failure (3percent), buying the subjects to be given in future exams (1.5 percent), paper or written material fabrication, by inventing quotation sources (4.5 percent). A high degree of difficulty in courses and a short period for preparation were also identified as the most frequent reason for unethical behavior,

followed by the leniency of teachers and the importance of a quality grade for the student.

Yukhymenko-Lescroart (2014) examined and compared the beliefs of 270 undergraduate students of the United States and Ukraine regarding twenty-two forms of plagiarism, cheating, and questionable academic behaviors. According to her research, students in the United States and Ukraine believe academic dishonesty in a statistically significant way. Comparing Ukrainian students to students in the United States, the study indicates that Ukrainian students are less likely to view academic misconduct as wrong, and also appear to hold different beliefs on what is and is not academic misconduct.

During the academic misconduct period, Rehman and Waheed (2014) investigated behavior patterns of doctoral and postdoctoral students as well as their perception of such conduct. Furthermore, they identified the ethical limits set by the students regarding academic dishonesty. According to their findings, about 51 percent of respondents with an age ranging from 21 to 35 years believe academic dishonesty has become a normal part of life while 48 percent of students believe it is an ethically wrong activity. However, 47.5 percent of students considered academic dishonesty to be unethical yet normal in Pakistan and identified it as an unwise habit that should be avoided.

Jones (2001 & 2011) found that many students have difficulty identifying academic dishonesty. Students correctly identified only nine of the 20 scenarios in this sample. Among them, 'turning in another person's assignment

as your own assignment (100 percent) ' 'cutting and pasting a paper together using online materials without appropriate citations (92 percent)', 'purchasing a paper from a research service or downloading one from the internet (75 percent)', and 'delivering an oral/ digital presentation based on information copied directly from the internet without appropriate citations (75 percent)' were identified as the top scenarios.

A study by Greene & Saxe (1992) confirms that academic dishonesty is perceived to be normal behavior among students. Similarly, Davis, Grover, Becker, and McGregor (1992) found that the actual action of students to commit academic dishonesty was in direct opposition to their perceptions of the act. Of the sampled students (90 percent who think academic dishonesty is wrong), 76 percent engaged in unethical academic activities. Lack of awareness leads to unethical academic activities, according to the study.

According to the results of a study conducted by Bacore (2014), students are prepared to face a wide range of issues, both in life and in society. Families were proud and neighbors respected their university students for years because of their honor, integrity, and sincerity. University students are also looked up to as role models by students in schools and colleges. Society expects higher education institutions to adhere to high standards of academic integrity, fairness, and impartiality. He found that academic dishonesty, in violation of these social values, has reached alarming proportions in all higher education institutions, resulting in widespread cynicism and public disbelief.

As per the statistics of the Bangladesh Bureau of Educational Information and Statistics (BANBEIS), in Bangladesh, 46 public universities including the National University and 96 private universities are in operations for higher education. Students after participating in a competitive exam or admission test admit themselves to the universities, particularly in the public universities. It is expected by the public, parents, future employers, and government that they as qualified and mature students perform no unethical activities that are against the academic rules or code of conduct. But surprisingly some of the students are doing some activities that harm or give a negative impact, either little or enormous to other parties directly or indirectly. The students are also misbehaving with their teachers and others in the academic environment. No doubt, students' unethical behaviors decelerated the smoothness and e?ectiveness of the teaching-learning process. Moreover, research ?ndings have shown that over time students' unethical behaviors were not only being intensified but also lowered academic achievement and increased delinquent behavior. To minify the immediate and gradual adverse impact of student misbehaviors, it is of time demand to carry out more study to identify what exactly are these unethical behaviors in and outside the class and exam rooms. At home and abroad numerous studies focused on ethics and ethical issues in different areas. Very few studies were on ethical issues in education and no specific studies were carried out on students' ethical beliefs and behaviors on these activities, especially at the university level of Bangladesh. Thus, there is a need to further measure the

degree of ethics in behaviors as believed and practiced by the selected university students.

Research Questions

The literature relating to ethical issues in university teaching and learning supports the need for studying the university students' beliefs and behaviors and leads to find out the answer to the following research questions:

1. What characteristics the selected university students possess that influence their beliefs and behaviors?

2. To what extent do the sample students believe the students' activities as ethical?

3. Which behaviors do the sample students practice in and out of the classroom and with their teachers and others?

Scope & Limitations of the Study

The study was confined to the selected 6 universities (3 public and 3 private) only. The students who have been studying for at least one year were included in the sample respondents. Due to time, and resource constraints, other universities were not studied. During the survey, the researchers encountered several challenges in collecting questionnaires distributed to the students. Many students even after committing unethical activities did not admit during filling up of the questionnaire. However, answers provided by them are assumed to be honest and true. It would be better if the reasons for the students' unethical behavior could be identified.

Methodology of the Study

The present quantitative study examined both primary and secondary data. The primary data were collected from the sample students of the selected universities. Considering the time and resource constraints, 270 students (fulfilling the law of a large sample) were randomly selected as a sample size from the selected 6 universities (3 public and 3 private) universities. It is very difficult to obtain information about people's unethical behavior through face-to-face interviews as these are mostly confidential. The researchers were bound to distribute a semi-structured questionnaire to the selected students in the class and collect the same from them instantly after filling it up by them. The questionnaire consisted of two sections. The first section dealt with the students' characteristics where the second section was meant for themselves to know what the students believe and what they do in their ethical activities (28 items-12 items that affect the class and 16 items that are observed in the examination hall and other places of the university). The questions of the latter section were of 5-point Likert scale ranging from 1 = "Completely ethical" to 5 = "Completely unethical" for measuring the students' beliefs on their ethical activities and for measuring their behaviors on the same items it ranges from 1="Forgotten" to 5="Always". As measured by Cronbach's alpha coefficient, the items in the questionnaire were found to be reliable (0.798), falling within the acceptable limit in Nunnally (1978). A variety of books, journals, unpublished reports, websites, and other publications contributed to the gathering of secondary data. Simple frequency counts and percentages were used to describe the data. The weighted average mean was used to determine to extent of ethical beliefs and practices on the students' ethical activities in their respective universities.

Results and Discussions

Table 1: Characteristics of the Sample University Students (n=270)

Characteristics	*Categories*	*No. of Students*	*Percentage*	*Mean*
Age	Below 20 years	86	31.9	22 years
	20 years to 25 years	152	56.3	
	25 years to 30 years	28	10.4	
	30 years and above	4	1.5	
Gender	Male	157	58.1	
	Female	113	41.9	
Religion	Islam	238	88.1	
	Hinduism	25	9.3	
	Christianity	4	1.5	
	Buddhism	3	1.1	
Class of Study	Hons. 2nd year	127	47.0	
	Hons. 3rd year	59	21.9	
	Hons. 4th year	43	15.9	
	Masters	41	15.2	
Areas of Study	Humanities	56	20.7	
	Business studies	147	54.4	
	Science	67	24.8	

Source: Field Survey

Table 1 shows the characteristics of the students who were interviewed to know their ethical beliefs on the university students' activities and their practices thereon. During the survey, the majority (47 percent) of the sampled students were in honors 2nd year and the least respondents were in master's class level. Out of the 270 surveyed students, 113 are female, representing 41.9 percent of the total, and 157 are male (58.1 percent). The data on their area of study shows that 54.4 percent were studying business studies, 24.8 percent in science, and the remaining 20.7 percent were in the humanities group.

To examine students' ethical beliefs on the 28behaviors, each student was asked to rank the behaviors on a five-point Likert scale with 5 being completely unethical; 4 slightly unethical, 3 being not sure, 2 being slightly ethical, and 1 being completely ethical. The higher the weighted mean score, the more unethical the group viewed the behavior. The ratings of the practices of these behaviors by the sample students were done using a five-point scale ranging from 1 (forgotten) to 5 (always). Descriptive statistics and the weighted mean scores of the individual beliefs and behaviors are organized in the following table.

In achieving the second objective of this study, the weighted mean score for each of the statements of the students' beliefs and

behaviors was computed. Almost all statements are generally assumed to be negative of ethics. For these statements, the high level of unethical beliefs is considered if students' weighted mean score is 4 or above.

Similarly, if the students' weighted mean score of ethical practices of any behavior is 3 or above, there is a gap between their beliefs and practices.

Table 2: Ethical Beliefs and Practices on University Students' Behaviors in and outside the Classroom

Students' Behaviors in and outside the Classroom	Students' Ethical Beliefs(n=270)						Students' Ethical Practices(n=270)					
	Completely Ethical (1)	Slightly Ethical (2)	Not Sure(3)	Slightly Unethical(4)	Completely Unethical(5)	Weighted Mean Score	Forgotten(1)	Never(2)	Once or twice(3)	More than twice(4)	Always(5)	Weighted Mean Score
Using mobile phones in the class during class time.	28 (10.4)	6 (2.2)	6 (2.2)	48 (17.8)	182 (67.4)	4.30	8 (3.0)	83 (30.7)	135 (50.0)	39 (14.4)	5 (1.9)	2.81
Walking in and out of the classroom during class time.	12 (4.4)	3 (1.1)	7 (2.6)	38 (14.1)	210 (77.8)	4.60	7 (2.6)	161 (59.6)	84 (31.1)	12 (4.4)	6 (2.2)	2.44
Intentionally irritating teachers.	10 (3.7)	6 (2.2)	5 (1.9)	41 (15.2)	208 (77.0)	4.60	2 (4.4)	203 (75.2)	36 (13.3)	17 (6.3)	2 (0.7)	2.24
Teasing classmates.	17 (6.3)	3 (1.1)	12 (4.4)	41 (15.2)	197 (73.0)	4.47	16 (5.9)	169 (62.6)	60 (22.2)	18 (6.7)	7 (2.6)	2.37
Mongering & whispering in the class.	16 (5.9)	5 (1.9)	15 (5.6)	72 (26.7)	162 (60.0)	4.33	15 (5.6)	118 (43.7)	103 (38.1)	30 (11.1)	4 (1.5)	2.59
Making fun of the teachers by mimicking their voices.	9 (1.9)	11 (4.1)	13 (4.8)	28 (10.4)	213 (78.9)	4.6	9 (1.9)	182 (67.4)	63 (23.3)	15 (5.6)	5 (1.9)	2.38
Sleeping in the class.	25 (9.3)	10 (3.7)	31 (11.5)	80 (29.6)	124 (45.9)	3.99	21 (7.8)	118 (43.7)	89 (33.0)	38 (14.1)	4 (1.5)	2.58
Going out of classroom without teachers' permission.	28 (10.4)	15 (5.6)	25 (9.3)	55 (20.4)	147 (54.4)	4.03	11 (4.1)	155 (57.4)	68 (25.2)	25 (9.3)	11 (4.1)	2.52
Talking about the teachers' ways of dressing.	44 (16.3)	15 (5.6)	34 (12.6)	67 (24.8)	110 (40.7)	3.68	15 (5.6)	117 (43.3)	98 (36.3)	34 (12.6)	6 (2.2)	2.63
Having discipline problems such as keeping long hair &french-cut beard,and usingbracelet, earphone, etc.	32 (11.9)	39 (14.4)	61 (22.6)	60 (22.2)	78 (28.9)	3.42	8 (3.0)	193 (71.5)	37 (13.7)	15 (5.6)	17 (6.3)	2.41
Deliberately remaining absent & late for the classes.	13 (4.8)	4 (1.5)	20 (7.4)	61 (22.6)	172 (63.7)	4.39	11 (4.1)	124 (45.9)	106 (39.3)	24 (8.9)	5 (1.9)	2.59
Cramming in the study	42 (15.6)	17 (6.3)	37 (13.7)	63 23.3)	111 (41.1)	3.68	7 (2.6)	67 (24.8)	116 (43.0)	68 (25.2)	12 (4.4)	3.04

Note: Figures in the bracket indicate percentages to the total.   Source: Field Survey

Table 2 reveals the degree of ethics as believed by the sample university students on their activities in and outside the classroom. The weighted mean score as shown in Table 2, testifies that 'walking in and out of the classroom' and 'irritating teachers intentionally by asking irrelevant questions or raising irrelevant issues' during class time were believed as the most unethical behaviors by the sample students. No activity listed in the table is believed by the students as even slightly ethical activity. However, the students are somewhat indifferent whether keeping long hair & the french-cut beard and using the bracelet & earphone in the classroom is ethical or unethical. It is observed in their many practices that the students did not do the activities ever what they believed completely unethical (e,g. intentionally irritating teachers by asking irrelevant questions or raising irrelevant issues). Some students, however, admitted that they often talked about the teachers' ways of dressing in the class but not of all teachers. The weighted mean score of all items is more than 2.0, which indicates the unethical practices of all activities once or twice by some students. Around 70 percent of the surveyed students agreed that they used mobile phones in the class at least once during class time what they believed unethical. Sixty-five percent of students confessed that they used mobile phones in the class as they felt no or low interest in their teachers' lectures.

Table 3: Ethical Beliefs and Practices on University Students' Exam Related and Other Behaviors

Students' Behaviors Related to Examination and Other Issues	Students' Ethical Beliefs (n=270)						Students' Ethical Practices(n=270)					
	Completely Ethical(1)	Slightly Ethical(2)	Not Sure(3)	Slightly Unethical(4)	Completely Unethical(5)	Weighted Mean Score	Forgotten(1)	Never(2)	Once or twice(3)	More than twice(4)	Always(5)	Weighted Mean Score
Requesting teachers for short suggestions before the examination.	69 (25.6)	35 (13.0)	20 (7.4)	83 (30.7)	63 (23.3)	3.13	10 (3.7)	59 (21.9)	131 (48.5)	47 (17.4)	23 (8.5)	3.05
Cheating on a homework assignment and in the examination.	7 (2.6)	3 (1.1)	2 (0.7)	5 (1.9)	253 (93.7)	4.83	7 (2.6)	213 (78.9)	45 (16.7)	1 (.4)	4 (1.5)	2.19
Making misbehavior with the invigilators & hall staff.	1 (.4)	5 (1.9)	3 (1.1)	9 (3.3)	252 (93.3)	4.87	9 (3.3)	250 (92.6)	10 (3.7)	1 (.4)	0 (0.0)	2.01
Writing name on the answer script.	7 (2.6)	4 (1.5)	19 (7.0)	31 (11.5)	209 (77.4)	4.60	13 (4.8)	231 (85.6)	19 (7.0)	1 (0.4)	6 (2.2)	2.10
Going bathroom frequently during the examination.	27 (10.0)	8 (3.0)	37 (13.7)	87 (32.2)	111 (41.1)	3.91	17 (6.3)	186 (68.9)	54 (20.0)	10 (3.7)	3 (1.1)	2.24
Using mobile phones in the examination hall.	9 (3.3)	3 (1.1)	9 (3.3)	34 (12.6)	215 79.6)	4.64	6 (2.2)	227 (84.1)	27 (10.0)	7 (2.6)	3 (1.1)	2.16

Submitting Assignments or Internship Reports that were copied from the internet or other students.	28 (10.4)	8 (3.0)	20 (7.4)	76 (28.1)	138 (51.1)	4.07	8 (3.0)	129 (47.8)	98 (36.3)	23 (8.5)	12 (4.4)	2.64
Making phone calls to course teachers after the examination in their favor.	13 (4.8)	4 (1.5)	9 (3.3)	44 (16.3)	200 (74.1)	4.53	8 (3.0)	232 (85.9)	26 (9.6)	2 (.7)	2 (0.7)	2.10
Not paying respect to the departmental & other teachers.	3 (1.1)	5 (1.9)	1 (.4)	17 (6.3)	244 (90.4)	4.83	8 (3.0)	243 (90.0)	14 (5.2)	4 (1.5)	1 (.40)	2.06
Showing interest to do course teachers' personal work.	67 (24.8)	46 (17.0)	47 (17.4)	45 (16.7)	65 (24.1)	2.98	21 (7.8)	146 (54.1)	79 (29.3)	17 (6.3)	7 (2.6)	2.42
Visiting the course teachers' residence frequently.	30 (11.1)	8 (3.0)	56 (26.7)	71 (26.3)	105 (38.9)	3.79	15 (5.6)	209 (77.4)	39 (14.4)	4 (1.5)	3 (1.1)	2.15
Giving gifts to the course teachers in ca ses of failure in the examination.	77 (28.5)	50 (18.5)	48 (17.4)	38 (14.1)	57 (21.1)	2.81	10 (3.7)	145 (53.7)	91 (33.7)	18 (6.7)	6 (2.2)	2.5
Smoking or taking illegal drugs with friends on university grounds.	7 (2.6)	3 (1.1)	9 (3.3)	28 (10.4)	223 (82.6)	4.69	8 (3.0)	225 (83.3)	20 (7.4)	8 (3.0)	9 (3.3)	2.20
Willfully damaging university property.	3 (1.1)	3 (1.1)	5 (1.9)	18 (6.7)	241 (89.3)	4.82	8 (3.0)	233 (86.3)	25 (9.3)	4 (1.5)	0 (0.0)	2.09
Acting as a proxy for another student during the admission test.	7 (2.6)	0 (0.0)	3 (1.1)	21 (7.8)	239 (88.5)	4.80	8 (3.0)	238 (88.1)	20 (7.4)	3 (1.1)	1 (0.4)	2.08
Exerting political influence on teachers, staff, & other students.	8 (3.0)	2 (0.7)	9 (3.3)	13 (4.8)	238 (88.1)	4.74	8 (3.0)	241 (89.3)	15 (5.6)	5 (1.9)	1 (0.4)	2.07

Note: Figures in the bracket indicate percentages to the total.
Source: Field Survey

Table 3 shows the students' ethical beliefs on their behaviors related to examination and other issues and also the frequencies of practices or occurrences of these behaviors or activities by themselves. The results reveal that almost all students (93.7 percent) believed 'cheating on a homework assignment and in the examination hall' completely unethical. Among the examination related behaviors, the next completely unethical behaviors as believed by the students are 'making misbehaviors with the invigilators and hall staff (93.3 percent)', 'not paying respect to the departmental and other teachers (90.4 percent)', 'willfully damaging university property (89.3 percent)' and 'acting as a proxy for another student during admission test (88.5 percent)'. The highest weighted mean score of students' ethical practices is more than 3, which indicates that students requested their

teachers for short suggestions before their examinations as they believed them as not so unethical. The majority of the students did never misbehave with invigilators and staff in their examination hall because they believed these behaviors as completely unethical. Regarding political pressure on teachers, staff, and other students, more than 90 percent of students did not do as they believed this behavior was unethical. One-half of the selected students admitted saying that they submitted their assignments or internship reports copying at least once from the internet or other students though four-fifth of the sample believed this activity unethical. The least weighted mean score (2.81) belongs to the behavior of giving gifts to the course teachers in case of failure in examination that they (47 percent) believed as ethical. Thus, the higher weighted mean score in ethical beliefs and the lower score in ethical practices demonstrate the commitment of students' ethical activities as per their ethical beliefs.

Conclusion & Recommendations

The preceding findings and discussions on the male, Muslim, and business studies dominated sample university students' beliefs and behaviors on their activities in and out of the classroom reveal that intentional irritating of the course teachers and walking in and out of the classroom during the class hours are believed as the most unethical issues and their engagements in these unethical issues occurred never or once or twice. So, on these points, it can be generalized that students' ratings on their beliefs and behaviors on ethical issues are congruent. What activities they believe as completely unethical are rarely performed by them. However, many students consider some activities like keeping long hair

& french-cut beard and using bracelets, earphones, etc. as ethical but not all of them practice those activities. Regarding the ethical beliefs and behaviors on their examination related and other activities, the results help to conclude that students' misbehavior with invigilators, cheating, disrespect with teachers, willful destruction of university property, acting as a proxy, etc. are rated as the most unethical issues in the university, the practices of which activities by the sample students are made seldom. Therefore, it can be concluded that the students who believe and are aware that one behavior is unethical will probably be practiced less.

The intentional disagreement of some students on their engagements in unethical activities warrants rigorous monitoring of the university teachers, guardians, and others that will help fulfill their expectations of students' honesty, academic integrity, patriotism, fairness, sincerity, attentiveness, etc. Each course teacher with conscious and deliberate effort should create such an ethical climate that will reduce the occurrence of his or her students' unethical behaviors. It is also an ethical responsibility of the university authority to take necessary steps including active proctoring in the examination hall, motivating students towards ethical activities, setting creative questions, using anti-plagiarism software, etc. for the prevention of students' cheating, plagiarism, misbehavior, and other forms of unethical activities, especially compatible with the advancement of technology and changing environment. The code of ethics for teachers and students is to be introduced, circulated, and maintained in the universities. Above all, there must be frequent reinforcement including punishment.

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Effect of Age and Teaching Experience over Stress: A Comparative Enquiry on Teachers from Liberal and Professional Education System

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ABSTRACT

Authors of this comparative study sought to examine the effect of age and span of teaching experience over stress of teachers working in liberal and professional education system. The sample of the study constitute 270 members of faculty consisting 135 members, each from liberal and professional education system. From Liberal Education System, sample deduced from 35 general degree colleges and 10 public universities; from professional education system, sample collected from 15 Teachers' Training Institutes, including institutions, managed by the government (Central as also the state), philanthropic as well as private Institutions from West Bengal. A double-staged sampling technique was adopted for the study viz., cluster sampling technique in terms of clusters like area-Rural, Urban, Suburban and Institutes with management structure, i.e., Govt., Private and Philanthropic organizations. Stratified random sampling technique was further implied to draw the sample from the clusters and stratification was done in terms of age Group (Lower, Middle, Higher) and Teaching Experience (Low, Middle, High). Data were pulled by adopting one set of standardized scale dedicated for target-group of this study. The results of the study revealed that age is not been having any significant impact over perceived stress of teachers working in liberal and professional educational system. But so far the span of teaching experience is concerned, study revealed to have significant effect over stress of teachers among the lower, middle and higher age-groups, working in both liberal and professional education system.

Key words: Teachers' Stress, Liberal Education System, Professional Education system

Introduction

After conducting several surveys on the topic of stress and illness, the World Health Organization (2002) came with the conclusion that stress is hitting a fever pitch in every nation. Shieves (1990) suggested that stress accounts for a considerable low productivity at work. He holds that about twenty-five percent of all absenteeism at workplaces

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leading to low productivity is caused by stress related problems. Furthermore, about eighty to ninety percent of all industrial accidents are related to emotional stress. In view of this, there is a growing concern in the nature, causes, effects and management of stress in the teaching profession. Teaching which was once considered a rather routine job has within the last decade become an increasingly complex profession. In recent years, our educational system has become the target of widespread scrutiny and criticism, while at the same time the rewards of teaching are often obscured by the difficult working conditions that are prevalent in many of the Institutions. Against this backdrop of heightened job-pressure and reduced professional satisfaction, it is not surprising that alarming statements have been issued repeatedly in the educational literature about the growing prevalence of teacher's stress and burnout (Borg, 1990; Cox & Brockley, 1984; Farber, 1984, 1991; Hodge, Jupp, & Taylor, 1994; Holt, Fine, & Tollefson, 1987). Teacher's profession as a component of coadjutant professions belongs to those that impose significant requirements on the person performing them from emotional, cognitive, social and also physical side. In the context stated by Kyriacou (1996), he used the term 'teacher's stress', which he further defines as situations, in which teachers feel angry, aggrieved, nervous, disappointed, when they feel tension or anxiety as a result of some fact, which is related to their pedagogical activity. Kyriacou (2001) states that teacher's stress represents a complex of interactions between coping mechanisms, personal features and environment, which are in a mutual relationship.

Liberal education is an approach to undergraduate education that promotes integration of learning across the curriculum and co curriculum, and between academic and experiential learning, in order to develop specific learning outcomes that are essential for work, citizenship, and life. Whereas, Professional education is a formalized approach to specialized training in a professional institution through which participants acquire content knowledge and learn to apply techniques. Although content is what the participant is expected to learn by attending professional institution, such an education also helps the participant acquire the competencies needed for proper practice and behaviour. Some common goals of professional education include incorporating the knowledge and values basic to a professional discipline; understanding the central concepts, principles, and techniques applied in practice; attaining a level of competence necessary for responsible entry into professional practice; and accepting responsibility for the continued development of competence. It is designed to produce responsible professionals and then to ensure their continuing competence in the profession by helping them recognize and understand the significance of advancing professional knowledge and improving standards of practice. It involves the translation of learning to practice and is intended to prevent occupations and professionals from becoming obsolete.

Review of Related Literature

Teachers' stress has been reportedly greater than that for the general population (Tuettemann & Punch, 1992). Mushroom growth of self-financing educational institutions

has changed the organizational climate at the institutions (Devi and Velayudham, 2003). Reddy and Poornima (2012), have shown that majority (74%) of the university teachers are experiencing moderate and high level of stress and 86% of teachers have professional burnout. They also found that there is a positive relationship between the occupational stress and professional burnout among the university teachers. Inadequate salary is the primary factor causing stress followed by inadequate resource and facilities, and problems with superiors and peers (Jagadeesh, 2013). Wong, R. (2020) conducted a study to find out the main stressors are and whether gender and teaching experiences will make a difference on how teachers perceive job-related stress. Accordingly, ANOVA results revealed that years of teaching experience was significant predictor of Job Stress. Teachers with more than 30 years of teaching experience received highest level of stress from 'demands from job' and 'work-life balance' among other groups of teachers. Teachers with 11-20 years of experience had highest level of stress from 'control over work' and 'psychosocial work environment'. While teachers with 6-10 years of experience suffered highest level of stress from 'health and well-being', 'future and change', 'relations at work', and 'physical environment'. Shafaghat et al. (2018) examined factors affecting occupational stress and strategies for coping with it among 190 nurses at Shahid Rajaee Hospital. Using Pearson correlation coefficient tests, Mann-Whitney tests, and t-tests, the results found that occupational stress was rated as moderate among the studied nurses. Also, significant positive correlations were found between occupational stress level and less effective coping method, occupational stress level and work experience level, and ineffective coping methods and age. Moreover, a significant difference was seen between men and women in terms of emotion-focused coping. Ageyemang, C. et al. (2013) wanted to examine the influence of demographic factors on job stress and job satisfaction among custom officials in Ghana. The results reported that officers in preventive services were found to have experienced greater job stress and lesser job satisfaction compared to officers in custom and excise services. In terms of gender, males and females did not differ on job stress and job satisfaction. Similarly, job rank had no impact on job stress and job satisfaction of custom officials from the Ghanaian setting. Bharati, T. (2013) wanted to assess the association between job stress and demographic factors and coping strategies adopted by primary school teachers. The findings of the study revealed that no significant association was found between the sources of job stress and selected variables like age, marital status, family type, family size, income, educational qualifications and teaching experience. Roy, R. et al. (2010) carried out studies over 'Professional Stress' as Psychopedagogical attributes and examined the effect of teaching experience, age over Professional Stress and studies revealed that there was positive, direct effect of age and teaching experience over Professional Stress. Kaur, R. et al. (2013) aimed to explore the effect of demographic factors viz. age, income, length of service, and hierarchical level on various dimensions of occupational stressors. The findings of the study revealed that respondents belonging to the age group of above 29 years experienced more stress than

other age groups and the respondents who earned monthly income above 50,000 experienced more stress compared to others. Further, the respondents with more than 5 years length of service and higher hierarchical level predicted high level of stress as compared to other groups. Mahmood, D. et al. (2013) aimed to explore the impact of age and level of experience on occupational stress of academic managers at higher education level. The findings of the study reported that significant negative relationship was found in responses of academic managers regarding impact of age and management experience on occupational stress. Klassen, R. M. (2010) wanted to examine relationship between different demographic variables and Teacher Self-efficacy, Job Stress. The study revealed that teacher's years of experience showed nonlinear relationship with self-efficacy factors with greater workload pressure. Antoniou et al. (2006) conducted a study to find out the effect of gender and age differences in occupational stress and professional burnout of teachers between primary and high school teachers in Greece. The results of the study revealed that younger teachers experienced higher levels of burnout, specifically in terms of emotional exhaustion and disengagement from the profession, while older teachers experienced higher levels of stress in terms of the support, they feel they receive from the government.

Defining the Key Attributes

The key attributes on which the present study hinges on, are: Teachers Stress, Liberal Education System, Professional Education System. Here, the researchers initiated the study, titled as Effect of age and span of

teaching experience over Teachers' stress: A comparative enquiry over teachers in Liberal and Professional Education System.

'Teachers' Stress'

Claxton (1989) indicated that teaching is an occupation which is always demanding and changing. On the other hand, stress possesses physical and emotional effects on us and can create positive and negative feelings. As a positive influence (eustress), stress can help and compel us to act; it can result in a new awareness and an exciting new perspective. As a negative influence (distress), it can result in feelings of distrust, rejection, anger and depression. Occupational stress is defined as the perception of a discrepancy between environmental demands (stressors) and individual capacities to full fill these demands (Topper 2007).

Occupational stress in context of the present investigation will denote' teachers' Stress', which occurs when teacher subjectively experiences an incompatibility between himself or herself and his or her work environment, and feels unable to cope, adapt or function effectively as a result of which s/he endures poor mental or physical health or engages in dysfunctional and even counterproductive behaviours.

'Liberal Education System'

According to Association of American Colleges & Universities -A voice and A call for Liberal Education defined as 'Liberal education is an approach to learning that empowers individuals and prepares them to deal with complexity, diversity, and change. It provides students with broad knowledge of the wider world (e.g., science, culture, and society)

as well as in-depth study in a specific area of interest. A liberal education helps students develop a sense of social responsibility as well as strong and transferable intellectual and practical skills such as communication, analytical and problem-solving skills, and a demonstrated ability to apply knowledge and skills in real-world setting'. Liberal Education strives to deliver an academic experience that disseminate intellectual curiosity, a critical thought process, self-reflection, leadership and teamwork skills, a sense of commitment and professionalism and a heightened sensitivity to one's socio-cultural environment.

Here the researchers rightly pointed out the liberal education as hard-core general education discipline as B.A (Education) & M.A. (Education) level at undergraduate and post graduate level.

'Professional Education System'

Professional education system conceptualized as the formal training program where the student-teacher uses to gain expertise and skill on strategies and tactics of deliberation of content knowledge whatever one learns from curriculum. Teacher educators as a specialized professional group within education create their own specific identity and have their own specific professional developmental needs. Professional education is available over a wider sphere such as biomedical, medical, optometry, hospitality, management, mass media communication, tourism, engineering and so on. In India teacher education comes under professional educational system for preparing a strong set of man power of dynamic knowledge and skill, to apply techniques in practical field.

Here in this present research, professional education system implies education at B.Ed. and M.Ed. level, mostly thrives to Teacher Education for making a cadre of skill based man power in teaching learning community.

'Age Groups'

The sample of the present study has been collected and classified in three broad categories in terms of Age groups i.e., lower age group, middle age group, higher age group.

Lower Age Group: The group of respondents of sample has been falling in the age limit between 21 to 35 years.

Middle Age Group: The group of respondents of sample has been falling in the age limit between 35+ to 50 years.

Higher Age Group: The group of respondents of sample has been falling in the age limit between 50+ to 65 years.

'Experience Groups': The sample for the present investigation was classified in three broad categories, based on their span of teaching experience viz. lower experience group, middle experience group and higher experience group.

Lower Experience Group: The group of respondents of sample were fallen in the lower experience span, possessing less than five (< 5 Years) years of teaching experience in their profession.

Middle Experience Group: The group of respondents of sample was fallen in the middle experience span, possessing the teaching experience in the concerned cadre, ranging from minimum of five years in the lower end and maximum of fifteen years in the upper end.

Higher Experience Group: The minimum span of experience considered under the category was more than fifteen years. Maximum service length of the category was up to thirty-five years, as found in the sample.

Objectives of the Study

The objectives of the present study were as follows:

1. To explore the level of stress of teachers belonging to liberal and professional education system and to compare their stress level.

2. To find out the effect of age over the stress level of teachers working in liberal and professional education system.

3. To find out the effect of span of teaching experience over stress level of teachers working in liberal and professional education system.

Methodology of the study

Methodology, following which the present study was conducted are as follows:

Sample

The sample of this present investigation comprised of 270 members of faculty consisting 135 members each from liberal and professional education system. In Liberal Education System, sample deduced from 35 general degree colleges and 10 government universities, whereas in professional education system, sample was collected from 15 Teachers' Training Institutes which accords institutions managed by the government [Central as also the state], philanthropic as well as Private Institutions from West Bengal.

In this investigation, a double-staged sampling was adopted for the study. Firstly, cluster sampling technique was adopted to draw sample in terms of clusters like areas - Rural, Urban, Suburban and Institutes with management structure, i.e., Govt., Private and Philanthropic organizations.

Stratified random sampling technique was further implied to draw the sample from the clusters and stratification was done in terms of following strata:

a. age group (lower, middle, higher), and

b. teaching experience (low, middle, high).

Tools

To measure the level of teachers' stress of the respondents as sample of the study, the TSS, validated and standardized scale was administered over the sample of the concerned study. The scale was developed in questioning cum statement pattern including 23 items with a scale range from 23 to 69 with a midpoint is 46. This scale is three-point Likert scale. All the items scored as: Often-3, Sometimes-2, Rarely-1, developed by the Psychology Research Unit of Indian Statistical Institute [ISI], Kolkata.

Data

Data were collected from the respondents by administering the scales. By nature, collected data were quantitative; and were analysed through descriptive statistics, correlation, 't' test and ANOVA.

Findings

Findings of the present investigation are as follows:
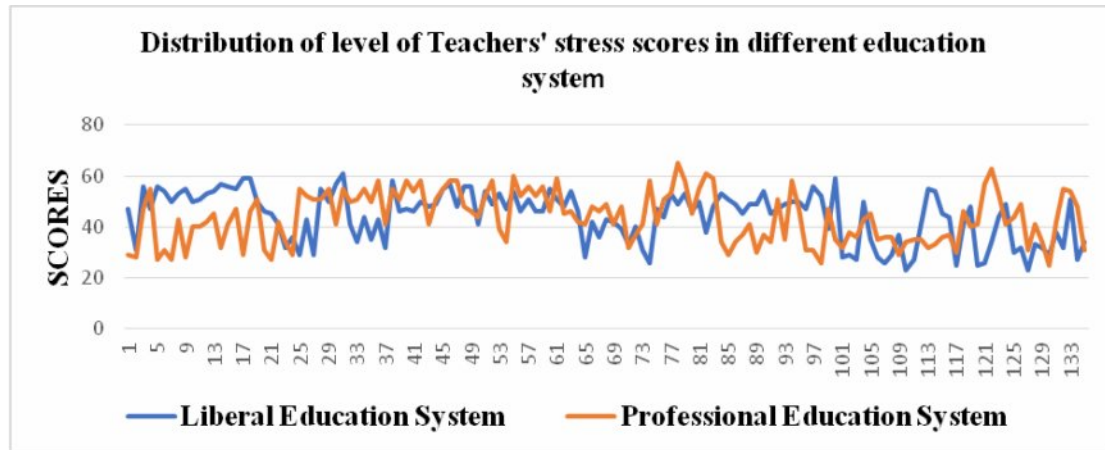
Figure 1: Distribution of stress score of respondents in different education system (N=135 of each education system)

Table 1: Observation of stress score of total sets of respondents in terms of M and σ

Observation (N=270)	Liberal Education System (N=135)		Professional Education System (N=135)	
	B.A.	**M.A.**	**B.Ed.**	**M.Ed.**
Mean (M)	47.35	35.17	44.96	39.91
SD (σ)	7.92	9.98	10.11	8.83
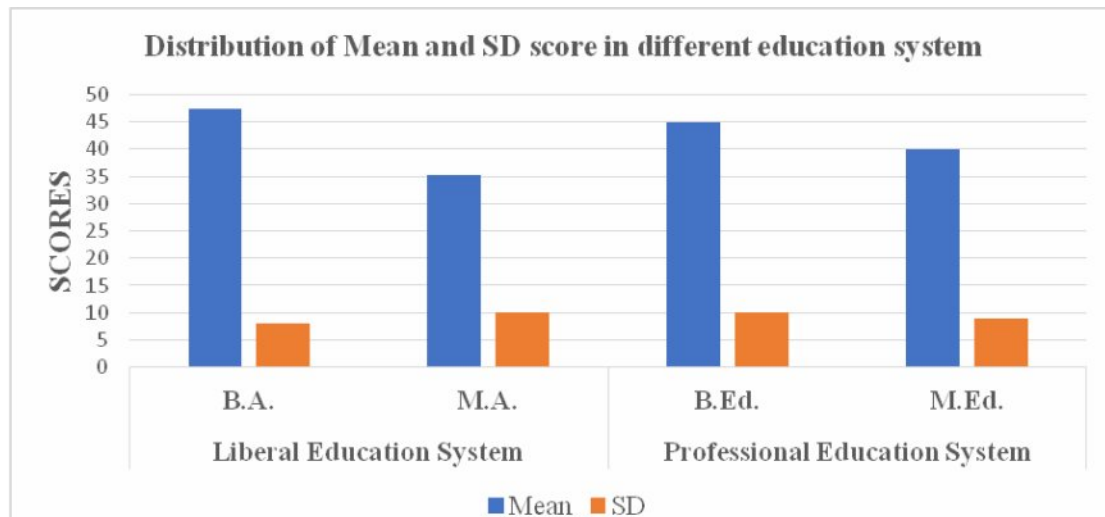
Figure 2: Distribution of Mean (M) and Standard Deviation of Stress Score of teachers working in Liberal and Professional Education System (N=270)

Analysis of the data over the above group of respondents (N=270) of two education system viz. liberal and professional, reveals that

(i) So far as the teachers' stress was concerned, the group of respondents, teaching at UG liberal education system [belongs to B.A. (Education) level] possess moderately higher level of Stress (M=47.35, ?=7.92, Midpoint=46) in the teachers' stress scale.

(ii) The group of respondents teaching at PG liberal education system [belongs to M.A. (Education)] possess very low level of stress (M=35.17, ?=9.48, Midpoint=46)

in Teachers' Stress Scale.

(iii) The group of respondents engaged in teaching at UG level in professional education system [belonging to B.Ed. level] possess slightly moderate level of stress (M=44.96, ?=10.11, Midpoint=46) over the teachers' stress scale.

(iv) As per variable defined as Teachers' Stress, the group of respondents engaged in teaching at PG level [belonging to M.Ed. level] of Professional Education System reported lower level of stress (M=39.91, ?=8.83, Midpoint=46) in Teachers' Stress Scale.

Table 2: Comparison of Teacher's stress based on overall stress score between liberal and professional education system

Level of Education system	Factor	N	Mean (M)	Standard Error	Standard Deviation(σ)	df	't'-value	P Value	LoS (0.05)
Liberal	Teacher's Stress	135	44.19	0.851	9.893	268	0.446	0.629	Not Significant
Professional		135	43.65	0.862	10.013				

Comparative analysis outcomes reported in Table 2 revealed that the respondents as teachers working in liberal and professional education system, exhibit no significant difference of perceived stress level, since here P value is greater than that of 0.05 level of significance.

Table 3: Level of teachers' Stress among age-groups (lower, middle and higher) in Liberal Education System

Source	Sum of Square (SS)	df	Mean Sum of Square	F value	P value
Between Groups	107.05	2	53.52	0.543	0.582
Within Groups	13007.94	132	98.54		

The ANOVA Table 3 revealed that respondents belonging to lower, middle and higher age groups from liberal education system did not differ in terms of Teachers' Stress level as calculated P value is greater than that of 0.05 levels and their stress score difference is not significant at any standard level of measurement.

Table 4: Level of Teachers' Stress in connection with age-groups (lower and middle) in Liberal Education System

Groups Under comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation (σ)	df	't' value	P Value	LoS (0.05)
Lower Age Group	Teacher's Stress	53	43.51	1.28	9.34	118	0.854	0.361	NS
Middle Age Group		67	45.06	1.25	10.27				

Table 4 depicted that the respondents belong to lower-age -group didn't differ significantly in terms of Teachers' Stress while compared to the respondents belonging to middle-age-group. Here, though the respondents belonging to middle-age-group possess comparatively higher level of stress in contrast to the respondents belonging to lower-age-group, however the difference was not significant at any standard level.

Table 5: Level of Teachers' Stress in connection with age-groups (lower and higher) in Liberal Education System

Groups Under comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation (σ)	df	't' value	P Value	LoS (0.05)
Lower Age Group	Teacher's Stress	53	43.51	1.28	9.34	66	0.277	0.410	NS
Higher Age Group		15	42.73	2.67	10.36				

As per comparative analysis of data of Teachers' stress attribute based on age group, Table 5 revealed that respondents belonging to lower age group didn't differ significantly in terms of stress level from respondent belonging to higher age Group (at 0.05 level of significance, since calculated P value is greater than 0.05). Respondents belonging to lower-age-group possess slightly higher level of stress compared to its counter respondent-group, belonging to the higher-age-group.

Table 6: Level of Teachers' Stress in connection with Age Group (middle and higher) in Liberal Education System

Groups Under comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation (σ)	df	't' value	P Value	LoS (0.05)
Middle Age Group	Teacher's Stress	67	45.06	1.25	10.27	80	0.79	0.829	NS
Higher Age Group		15	42.73	2.67	10.36				

In contrast to previous findings, Table 6 depicted that the respondent teachers from liberal education system belonging to middle-age-group and higher-age-group didn't differ significantly, so far as their level of stress is concerned. Data reveals that the respondents belonging to higher-age-group experienced lower level of stress compared to the

respondents belonging to middle-age-group; they exhibited comparatively higher level of stress and the difference was not significant at any standard level.
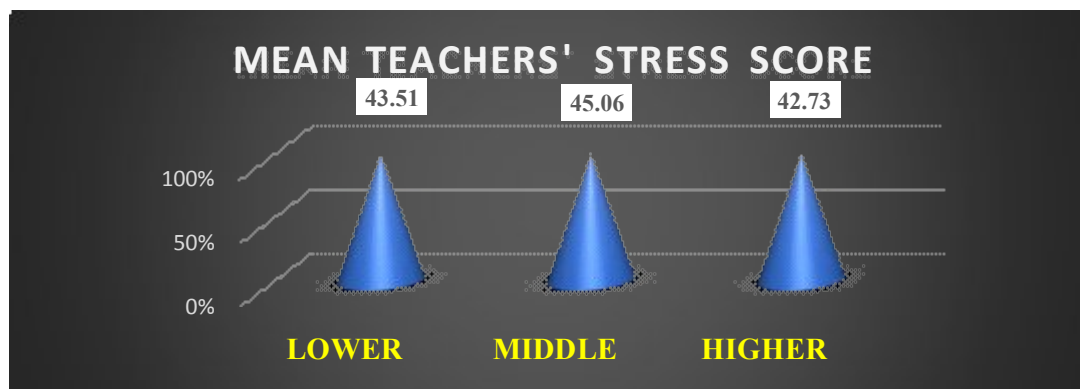

Figure 3: Mean Teachers' Stress Score in differing Age Group (Lower, Middle and Higher) in Liberal Education System (N=135)

So far as the preceded findings from the above analysis are concerned, it is evident that the age didn't have any significant effect over experiencing stress by the teachers belonging to liberal education system.

Table 7: Level of Stress among the age-groups (lower, middle and Higher) in Professional Education System

Source	Sum of Square (SS)	df	Mean Sum of Square	F value	P value
Between Groups	325.561	2	162.780	1.639	0.198
Within Groups	13109.076	132	99.311		

The ANOVA Table 7 depicted that the respondents belonging to lower, middle and higher age group didn't differ in terms of Stress level from professional education system, as calculated P value was greater than that of 0.05 level of significance and their stress-score-difference was not significant at any standard level of measurement.

Table 8: Level of Stress in connection with age-group (Lower and Middle) in Professional Education System

Groups Under comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation (σ)	df	't' value	P Value	LoS (0.05)
Lower Age Group	Teacher's Stress	73	43.78	1.187	10.14	131	.078	0.396	NS
Middle Age Group		60	43.92	1.267	9.81				

Table 8 revealed that the respondents belong to lower-age-group didn't differ significantly in terms of Stress in comparison to respondent belonging to middle-age-group, since the calculated P value is greater than 0.05 level of measurement.

Table 9: Level of Stress in connection with age-groups (Lower and Higher) from Professional Education System

Groups Under comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation(σ)	df	't'-value	P Value	LoS (0.05)
Lower Age Group	Teacher's Stress	73	43.78	1.187	10.144	73	1.76	0.090	Significant
Higher Age Group		2	31.00	3.000	4.243				

It is apparent from Table 9 that respondents belong to lower-age-group statistically did not differ significantly in terms of perceived stress-level when compared to the respondents belonging to higher-age-group but in respect to p value, it can be opined that there exists slightly significant difference between lower and higher age-groups.

Table 10: Level of Stress in connection with age-groups (Middle and Higher) from Professional Education System

Groups Under comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation(σ)	df	't' value	P Value	LoS (0.05)
Middle Age Group	Teacher's Stress	60	43.92	1.26	9.814	60	1.84	0.189	NS
Higher Age Group		2	31.00	3.00	4.243				

Table 10 revealed that respondents belonging to middle-age-group didn't differ significantly in terms of stress level from respondent belonging to higher-age-group (at 5 % level of significance), since the obtained P value is greater than 0.05.

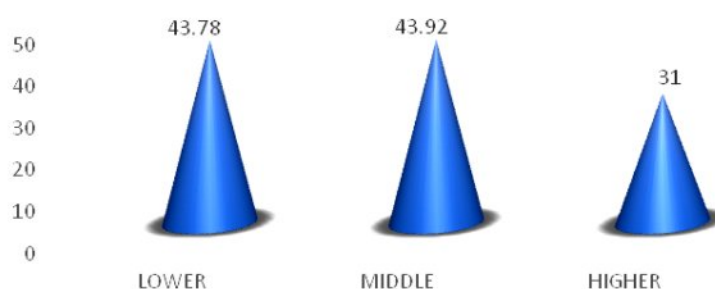**Figure 4: Mean Teachers' Stress Score in differing Age Group (Lower, Middle and Higher) in Professional Education System (N=135)**

So far as the teachers' stress is concerned, it was evident (from above three findings collectively clubbed in graphical presentation in Figure 4) that the age of teachers didn't have any significant influence over the respondents, belonging to different age-groups. The findings revealed that much stress was found among the respondents belonging to lower and middle age groups, whereas respondents belonging to higher age group experienced comparatively minimum stress and they were the high-stress-absorber.

Table 11: Level of Stress in connection with Teaching Experience among Lower, Middle and Higher Experience Groups in Liberal Education System

Source	Sum of Square (SS)	df	Mean Sum of Square	F value	P value
Between Groups	1745.228	2	872.614	10.13	0.0001
Within Groups	11369.765	132	86.13		

The ANOVA Table 11 revealed that the respondents belonging to lower, middle and higher experience groups differ significantly in terms of stress level in liberal education system as calculated P value was less than 0.05 and their stress-score difference was significant at standard level of measurement.

Table 12: Level of Stress in connection with Span of Teaching Experience (Lower and Middle) in Liberal Education System

Groups Under comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation(σ)	df	't' value	P Value	LoS (0.05)
Lower Exp. Group	Teacher's Stress	54	42.89	1.310	9.628	114	2.74	0.141	NS
Middle Exp. Group		62	47.52	1.086	8.548				

It is apparent from Table 12 that respondents belonging to Lower experience group didn't differ significantly in terms of their experienced stress level in contrast to their counterparts belonging to Middle experienced group as calculated P value was greater than 0.05 at 5 % level of significance. Respondents belonging to Middle experience group exhibits marginally higher level of stress compared to respondents, belonging to Lower experience group.

Table 13: Level of Stress in connection with Span of Teaching Experience (Lower and Higher) in Liberal Education System

Groups Under comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation(σ)	df	't' value	P Value	LoS (0.05)
Lower Exp. Group	Teacher's Stress	54	42.89	1.310	9.628	71	2.21	0.33	NS
Higher Exp. Group		19	37.05	2.418	10.53				

Table 13 revealed that there was no significant difference between the respondents belonging to Lower experience group and Higher experienced group. Respondents belonging to Lower experience group possess moderately higher level of stress in contrast to its counterpart respondent group, belonging to Higher experience group.

Table 14: Level of Stress in connection with Span of Teaching Experience (Middle and Higher) in Liberal Education System

Groups Under comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation(σ)	df	't' value	P Value	LoS (0.05)
Middle Exp. Group	Teacher's Stress	62	47.52	1.086	8.54	79	4.41	0.046	Sign.
Higher Exp. Group		19	37.05	2.418	10.53				

In contrast to previous findings, Table 14 depicts that the respondents belonging to Middle experience group differs significantly compared to its counter respondents belonging to Higher experience group so far stress level was concerned which was measured at 95% confidence interval. Respondents belonging to Middle experience group experienced higher level of stress, compared to respondents belonging to Higher experience group.
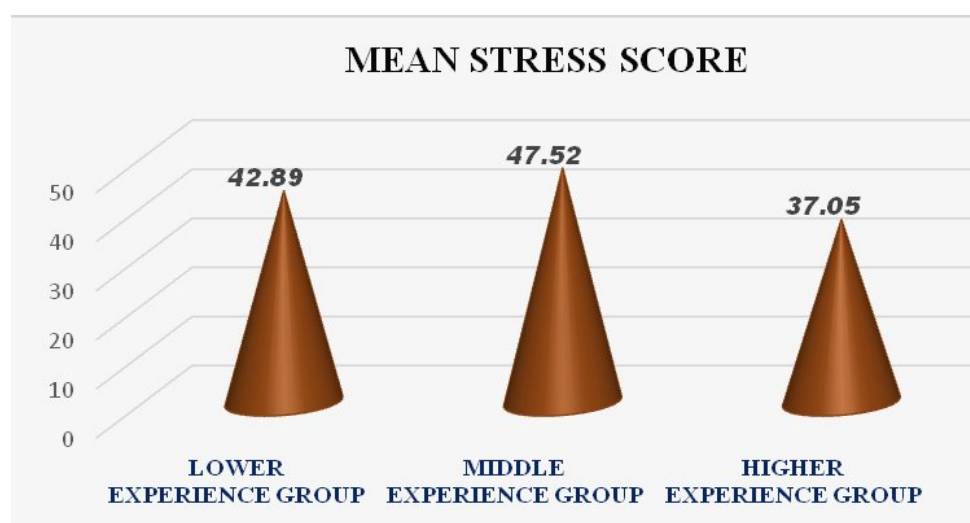
Figure 5: Mean Stress Score in differing experience group (Lower, Middle and Higher) in Liberal Education System (N=135)

From the Figure 5, it is visible that span of teaching experience was found to be significant predictor to perceive varied level of stress of respondents belongs to lower, middle and higher experience groups in liberal education system. The study observed that higher experience group experienced lesser stress compared to lower experience group and the rate of enhancement of stress was maximum in case of the middle experience group. The findings deduced a clear picture

that increase of stress value did not follow any correlated pattern in consonance with the enhanced teaching experience, but the middle experience group appeared to be as maximum stress absorber among these three respondent categories.

Table 15: Level of Stress of Teachers in connection with Teaching Experience among Lower, Middle and Higher Experience Group in Professional Education System

Source	Sum of Square (SS)	df	Mean Sum of Square	F value	P value
Between Groups	859.163	2	429.582	4.509	0.013
Within Groups	12575.474	132	95.26		

The ANOVA Table 15 revealed that the respondents belonging to lower, middle and higher experience group differs significantly in terms of Stress level in professional education system as calculated P value was less than 0.05 and their stress score difference is significant at standard level of measurement.

Table 16: Level of Stress in connection with Span of Teaching Experience (Lower and Middle) in Professional Education System

Groups Under comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation(σ)	df	't' value	P Value	LoS (0.05)
Lower Exp. Group	Teacher's Stress	74	45.61	1.131	9.732	126	2.043	0.96	NS
Middle Exp. Group		54	41.98	1.385	10.175				

It is apparent from Table 16 that respondents belonging to Lower and Middle experience Group didn't differ significantly so far, their stress-level was concerned. Respondents belonging to Lower experience group possess moderately higher level of stress value, compared to the respondents belonging to Middle experience group as calculated P value was lower than 0.05 at 5% level of significance.

Table 17: Level of Stress in connection with Span of Teaching Experience (Lower and Higher) in Professional Education System

Groups Under comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation(σ)	df	't' value	P Value	LoS (0.05)
Lower Exp. Group	Teacher's Stress	74	45.61	1.131	9.732	79	2.60	0.027	Sig.
Higher Exp. Group		7	35.86	2.040	5.398				

Table 17 revealed that respondents belonging to Lower and Higher experience group differed significantly so far, their level of stress was concerned. Respondents belonging to Lower experience group exhibits

marginally higher level of stress in contrast to its counterparts belonging to Higher experience group, which face a very low amount of stress level.

Table 18: Level of Stress in connection with Span of Teaching Experience (Middle and Higher) in Professional Education System

Groups Under comparison	Factor	N	Mean (M)	Standard Error	Standard Deviation(σ)	df	't' value	P Value	LoS (0.05)
Middle Exp. Group	Teacher's Stress	54	41.98	1.385	10.175	59	1.55	0.05	Sig.
Higher Exp. Group		7	35.86	2.040	5.398				

The comparative analysis of data reported in Table 18 depicted that the respondents belonging to Middle and Higher experience group differ significantly, so far as their level of stress was concerned. Respondents belonging to middle experience group possess marginally higher level of stress compared to their counterparts belonging to Higher experience group.
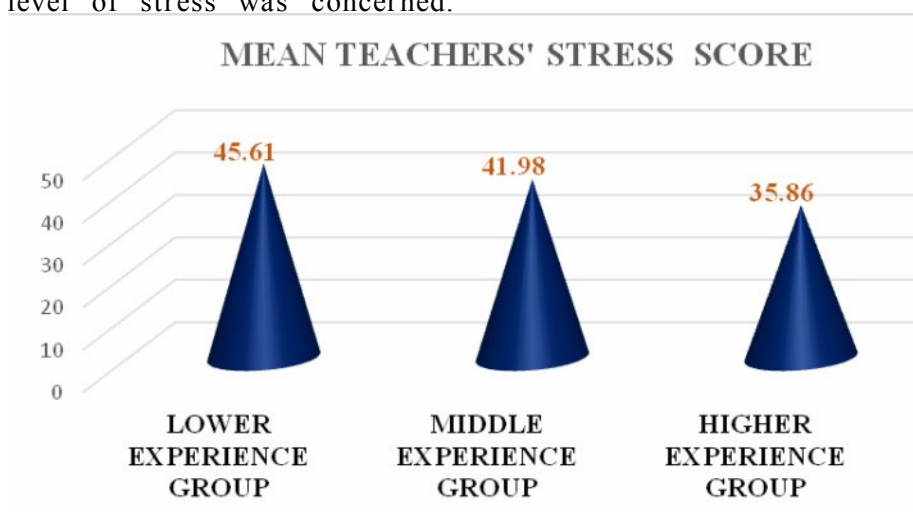

Figure 6: Mean Stress Score in differing experience group (Lower, Middle and Higher) in Liberal Education System (N=135)

From the above three findings, as well as from the Figure 6, it may be apparent that span of teaching experience of the teachers possesses significant impact over their level of experienced stress in professional education system. The study observed that Teachers' Stress reduces in consonance with enhancing span of teaching experience.

Discussion and Conclusion

The very first objective of the study was framed to explore the level of stress of teachers and to compare their stress-level, belonging to liberal and professional education system. The results of the descriptive statistics reported that respondent-group teaching at UG liberal Education [teaching at B.A.

(Education) level] and UG Professional Education [teaching at B.Ed. level] exhibit moderate level of stress whereas respondent-group engaged in PG liberal education [teaching at M.A. (Education)] and PG Professional Education [teaching at M.Ed. level] reported lower level of stress.

The second objective of the study was to find out the effect of age over the stress level of teachers working in liberal and professional education system. The results of the study revealed that differing age has no significant role to define variability of stress-score among different respondents belonging to different age-groups in liberal and professional education system. These findings go in consonance with studies, earlier carried out by Bharati, T. (2013) and Halpin et al. (1985) who also found that effect of gender or age don't contribute to promote Teachers' Stress; however, Kaur R. et al. (2013), and Roy et al. (2010) in their studies found that age of teachers possess positive and direct effect of over Professional Stress.

The third objective of the study was to find out the effect of span of teaching experience over the stress-level of teachers working in liberal and professional education system. The result of the study revealed that span of teaching experience was found to be significant predictor of perceived level of stress of respondents belongs to lower, middle and higher experience group in liberal and

professional education system. The study observed that in liberal education system, respondents from higher-experience-group experienced lesser stress compared to those from lower-experience-group and the rate of enhancement of stress was maximum in case of the middle experience group.

The findings establish a clear picture that increased value of stress didn't follow any correlated pattern in consonance with the enhanced teaching-experience, but the middle-experience-group appeared as maximum stress-absorber among these three respondent categories whereas in professional education system, the variability of stress-score depicted a definite pattern that teachers' stress reduces in consonance with enhanced span of teaching experience.

However, this finding is in contrast with the findings of the studies, carried out by Klassen, R.M. (2010) who stated that teachers' year of experience shows nonlinear relationship with stress. This may be due to the fact that the study carried out by Klassen was conducted more than a decade ago over a different group of respondents belonging to a different segment of education.

The very finding may be utilized by the educational managers and planners in the process of recruitment of teachers in such a way that the institution may benefit by its newly recruited teachers.

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Integrating Academic Research Activities in Education into Real Life Problem Solving: Bolstering 21ˢᵗ Century Skills in Young India

Shilpa Raghuvanshi Chauhan*

ABSTRACT

Innovations should ideally solve real-life problems of society. Designing innovative projects tends to train young minds to explore the unaddressed obstacles of society and resolve the problems through scientific and technical aptitude. No institution is more important for developing a culture of creativity and innovation than a school. Countries worldwide have realized that the main sources of job growth would come through innovation and entrepreneurship. For instance, China introduced various reforms that supported innovation and entrepreneurship amongst students and revamped its education system which helped it to bag 17th position among 130 contesting countries in the Global Innovation Index (GII)-2019 (Ku, 2009)(Renaud, 2008)(Tsui, 2002). Therefore, there is an urgent need to inculcate 21st-century skills and create a culture of innovation cum entrepreneurialism amongst students at the right age (Stephanie, 2010).

Key words: Innovation, real life problems, 21st century skills, scientific aptitude

Initiatives by the Indian Government

To increase scientific inclination and create a problem-solving mindset across schools in India, the government has launched multiple programs so that the young generation is groomed towards scientific research work.

1. Jigyasa is a Student-Scientist connect program wherein >3 lakhs students across the country are exposed to science and technology. It will stimulate their scientific thinking and temperament among school students at the right age.

2. Atal Tinkering LABS (ATL) is an approach of the Indian government to create an environment conducive to developing scientific temperament and creativity amongst Indian students. ATL-lab would teach students essential 21st-century skills which will help them to sharpen their professional and personal skills.

a) On January 11, 2021, the Department of Space and Atal Innovation Mission, NITI Aayog announced that ISRO will be adopting 100 Atal Tinkering Labs (ATLs) across the country.

b) On 9 April 2021, CSIR with its 36 labs have adopted 295 ATLs and their students across the country.

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These initiatives are going to be a path-breaking opportunity for young innovators across India to learn from the best minds and scientists of the nation.

3. Knowledge and Awareness Mapping Platform "KAMP" is an international intellect E-based assessment platform to evaluate cognizance of 21st-century skills, thinking skills, critical reading, awareness, and knowledge of Science, Technology & Humanities among students. It is an Initiative of CSIR-National Institute of Science Technology and Development Studies (NISTADS).

4. Rashtriya Avishkar Abhiyan "RAA": To connect school-based knowledge to life outside the school, to bring focus on innovation and use of technology; the Ministry of Human Resource Development launched this program.

5. National Level Programmes & Competitions: National Children's Science Congress (NCSC), Innovation in Science Pursuit for Inspired Research (INSPIRE), Million Minds Augmenting National Aspirations and Knowledge (MANAK), and Initiative for Research and Innovation in Science (IRIS) help students showcase their innovations.

6. Programme for International Student Assessment (PISA): The Indian government has decided to join the Programme for International Student Assessment (PISA) in 2021(now delayed to 2021) as a step forward in joining the international education community. PISA will help assess how well students can analyze, apply, and communicate what they learn in school to real-life situations and measure literacy in terms of knowledge, skills, and competencies.

7. The New Education Policy (NEP) 2020: NEP insists on absorbing and assimilating world-class foreign resources and institutions into the Indian mainstream. Such partnerships will transform institutions into intellectual hubs with innovation and research as focus.

Our Innovations

Project-based learning has been used for ages to induce an environment for better learning and stimulating critical thinking (Knoll, 1997). Students were trained to identify the unaddressed obstacles (in society) facing far-reaching reform and work on them while collaborating with research centres to offer innovative solutions that resolve the problems through their scientific and technical aptitude.

Engineering larvaecidal cakes from waste cigarette-butt

Engineered cakes had nicotine extracted from waste cigarette butts is lethal to mosquitoes & larvae. It produced CO_2 due to ongoing fermentation in the cake once immersed in stagnant water which acted as bait and attracted mosquitoes. It not only killed breeding larvae but also the mosquitoes by attracting them The left remnant of the cake is processed and used to enrich the soil in nitrogen content (Table1) (Fig. 1 &2).

Table 1: Area visited to identify unresolved problems and recognition received from the government for an innovative solution

AREA VISITED	PROBLEMS FACED BY THE LOCAL PEOPLE	AWARDS WON
Prahladgarhi village	1. Cigarette butt littering 2. Mosquito borne illness 3. Unemployment 4. Poor nitrogen content of the soil 5. Available anti mosquito spray or creams unaffordable	1. National award in ATL marathon 2018 2. CBSE regional award 2017-18 3. Runner up declared by Department of Environment-Government of NCT of Delhi awarded 4. Gold Medal by DOE zonal exhibition 2019-20

COLLECTING LITTERED CIGARETTE BUTTS

EXTRACTING ITS CONTENT

ADDING CONTENT THAT FOSTERS FERMENTATION ON BEING MOISTENED

LARVAECIDAL CAKE

Fig.1 Larvaecidal cake

Research At NIMR, ICMR:

TESTING LARVAECIDAL ACTIVITY OF CAKE IN RESEARCH LABORATORY

LARVAECIDAL CAKE
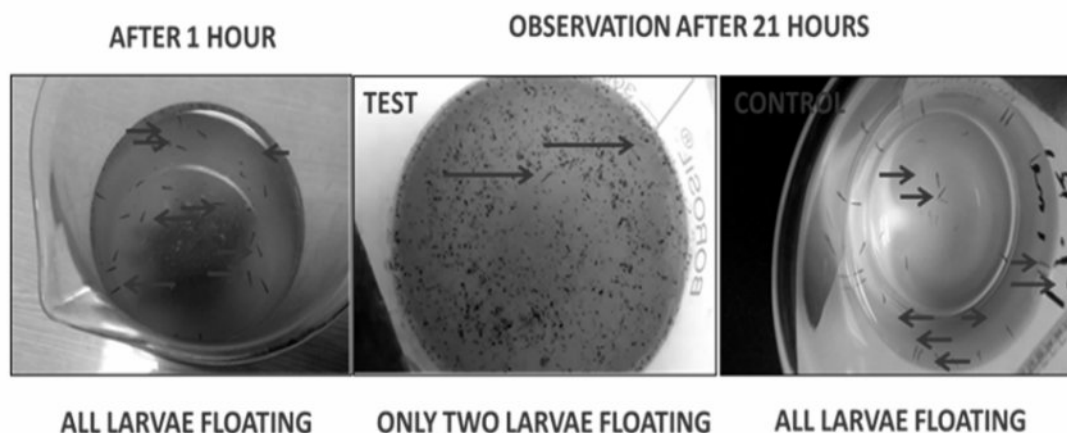
TEST   CONTROL
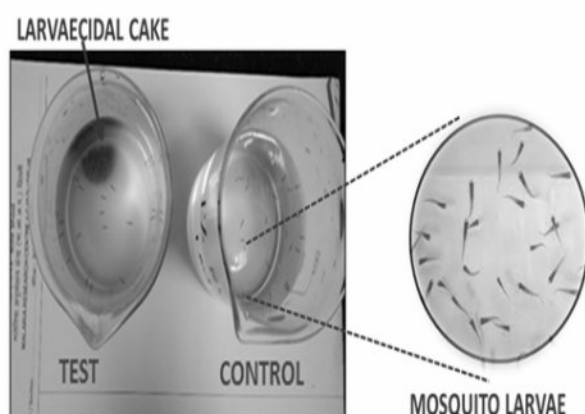
MOSQUITO LARVAE

Fig.2 Research showing that within 21 hours 18/20 mosquito larvae were killed in presence of cake

Plastoscope

Microscope made from a waste plastic bottle that can also be integrated into the laptop for mass education. It reused waste plastic bottles reducing plastic pollution and provided microscopes for students studying in lab-less schools that cannot afford expensive microscopes boosting the interest of young minds towards science (Table. 2) (Fig. 3).

Table 2: Area visited to identify unresolved problems and recognition received from the government for an innovative solution

| AREA VISITED	PROBLEMS FACED BY THE LOCAL PEOPLE	AWARDS WON
Mahalpa village	1. Plastic littering 2. Lab less schools in villages 3. Decline in students' interest in science	1. Awarded by Vice President Shri M. Venkaiah Naidu 2. National award INSPIRE MANAK 2019 3. Pradhan Mantri Innovative Learning Programme-DHRUV 4. CBSE regional award 2018-19 5. Showcased at IISc, Bangalore and IIT Delhi 6. Gold Medal by DOE zonal exhibition 2019-20
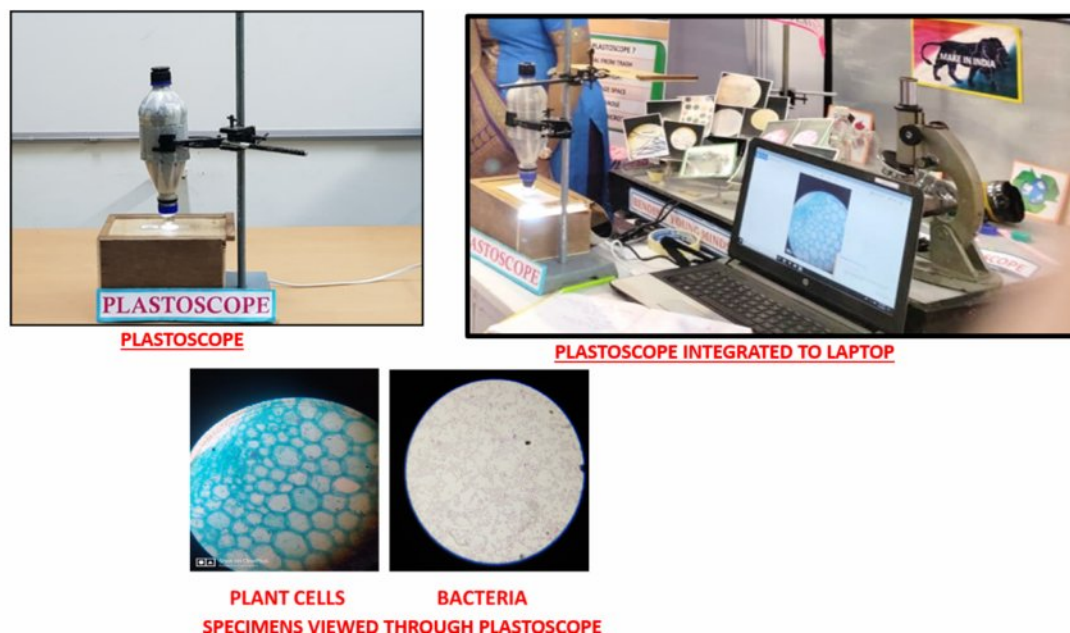
Fig.3 Image of plastoscope, its integration with laptop and specimen viewed through it

ECODOS-Biological radiation tracker

We developed the first of its kind in the world, wearable, disposable, quick, user-friendly, and cheap bio-hybrid biosensor dosimeter called "ECODOS". In this gadget living, bacterial cells were used to estimate the intensity of the radiation which is otherwise invisible unlike plastic, water, and air pollution. Hence this gadget helps to sensitize the presence of invisible harmful radiations around us and take precautionary measures (Table. 3) (Fig. 4 &5).

Table 3: Area visited to identify unresolved problems and recognition received from the government for an innovative solution

AREA VISITED	PROBLEMS FACED BY THE LOCAL PEOPLE	AWARDS WON
Mayapuri scrap market	1. Carcinogenic nature of some radiations 2. Radiation pollution 3. Radiation borne diseases	1. Cleared pre national level of "IRIS" 2. ATL state award winner 2019-20 3. CBSE regional 2018-19 4. IDEATE FOR INDIA 2019-north zone winners (Ministry of Electronics & Information Technology-GOI)

Fig. 4 Image of the gadget, its working principle and standard graphs plotted after research to estimate intensity of radiation

Fig. 5 Research showing decrease in bacterial count (CFU) with increase in intensity of radiation

Conclusion

Government Initiatives not only provided a platform to showcase students' creativity and innovation but also helped them realize that education should ideally solve unaddressed solutions of the society. Designing innovative projects in collaboration with research labs trained students right from exploring problems, inculcating new ideas, their conceptualization, and the making of a successful prototype. It significantly improved students' critical thinking and scientific aptitude bolstering initiatives like Make in India, Skilled India, and Swacch Bharat.

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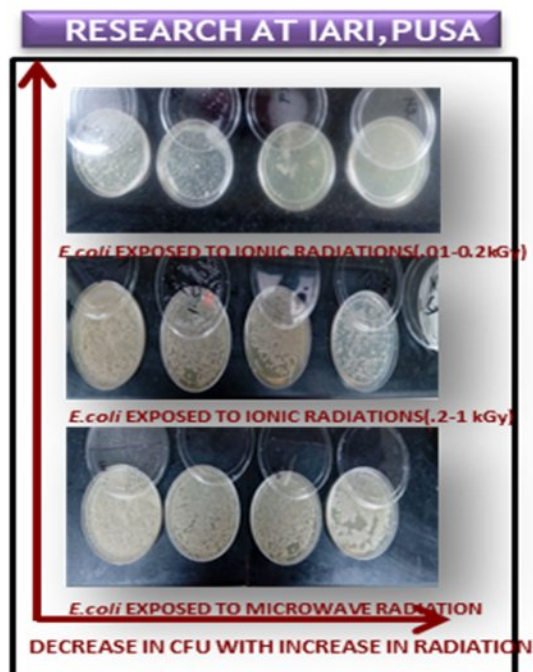
Teaching Interdisciplinary Courses Adapting Learning Driven by Technology

Bindu Salim*

ABSTRACT

Education needs to be identified as one of the key trends that drive the modern society since education is closely related to the trends in the industry growth. There is a close correlation between Industrial revolution 4.0, which is also referred to as the digital revolution demanding the transformation in education. One of the building blocks in IR 4.0 is "industrial success skills" which demands deep interdisciplinary knowledge and capacity to apply them and is a challenge while training students in the college. The skills to be fostered are problem solving, time management, soft skills to maintain discipline, industrial standards, data handling and analysis etc. Putting together all these, results in an interdisciplinary program for the students to get trained during their graduation. Holding these requirements in one hand and the curriculum structure on the other, we need to find a solution to build the skills required for the graduates to conquer the challenge of tomorrow.

The organization of teaching a course is always built from a previous experience. Unless changes are incorporated in the teaching and learning process, the opportunities of today's or tomorrow's students are narrowed. Changes are easily possible by adapting the advanced technologies which are in place for teaching and learning. The study here is exploring the effectiveness of online tools and peer support for slow learners. The undergraduate class of mechanical engineering consisting of 17 students learning electrical engineering course and the master's students of Nanotechnology consisting of 10 students learning polymer electronics form the sample. Students were categorized based on their learning capabilities, and personalized way of assignments and exercises were tried for effective learning. Peer support was also experimented by way of engaging the fast learners providing support and motivating the slow learners. All these were possible through online interactive tools like google classroom and WhatsApp group.

Key words: Engineering education, technology driven learning, online teachinge

Introduction

The day-to-day activities around the globe started making a transformation with the spread of a pandemic, the COVID 19. This has created disruption in the education system more than anything else in the history and learning from the home has become an

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inevitable situation. Online education though established with adequate infrastructure facilities in India, there remained an inertia to start learning from remote location. The rural India still needs upgradation of infrastructure to adapt to complete online teaching and learning at higher education effectively. While the rural technology infrastructure itself remaining a challenge, preparing the engineering graduates to face the challenges put forward by IR 4.0 need to be addressed much more seriously. Education Research is experimenting on many methodologies towards transforming pedagogy in engineering. Improving the cost effectiveness of teaching resources adding an international dimension to the education experience is one of the key advantages of online teaching. Peer teaching and learning always remained a foundation incorporating seniors teaching juniors, fast learners helping slow learners etc.. Student centric learning practices are also extremely attractive, and these practices are more effective by virtual interaction with teachers by way of synchronous means as well as asynchronous means. In the recent past, online monitoring tools are matured enough which allows superior quality teaching and learning by way of more involvement of the students doing projects, problem solving, and discussions compared to the involvement of students in learning only during contact hours. Here, an experiment on teaching an interdisciplinary subject with more involvement of the students through adapting technology is presented. This experiment has developed much confidence not only in the students but also in the teacher. Online resources like Zoom, Google classroom, Canvas, WhatsApp group, online quizzes, peer teaching and discussions were attempted. Learning by the students and meeting the course objectives were far above the conventional method.

Literature Review

Online education was referred to as distant education some time ago which has evolved into a new dimension added with the growth of technology in communication. Further, the development of learning management systems in place has dramatically changed the concept of learning to "anywhere anytime".While we define the pedagogy, it is especially important to assess how much these are helping to reduce the gap between academia and industry, which is one of the key parameters for evaluation by any of the accreditation agencies. This is appropriate because industry readiness of the graduating engineers should be assured in a global environment resulting from IR 4.0. Focus must be on developing interdisciplinary skills in engineering graduates. Transformational skills are more essential than just knowledge to integrate knowledge and resources to develop and deploy new solutions to global challenges. Societal changes are calling for a new type of engineers equipped with interdisciplinary skills. The need for scientific knowledge to be directly integrated with societal needs, the rationale for collaboration, nurturing alumni-alma mater relationship and further a SWOT analysis was also reported about Indian Technical education. Some of the weaknesses pointed out are worth mentioning here, such as shortage of qualified and competent faculty, lack of industry-institute interaction, mismatch between education and training received by the graduates for industry readiness, against one of the threats of competition from international players. The role of technology and technology education for national development and

prosperity was shown as the opportunities. In this scenario, project-based learning in engineering is much appreciated to eliminate the weaknesses pointed out above with an approach to cultivate socio-cultural constructivism. Educational technologies are proposed even for pre-engineering schools to put a better foundation for Science, Technology, Engineering and Mathematics (STEM). The pre-college training is proposed to enable engineering students to successfully do industry relevant projects, but the challenge lies in creating the necessary implements and competence in faculty in pre-college. To be successful, peer review of teaching methods, team teaching, forming teaching circles, preparing teaching portfolios etc. could be used[4]. Above all, the most important is that teaching also should be taken up like any other peer reviewed research activity so that innovations and creative ideas are dynamically applied for the benefit of the graduating students.

Defining the course objectives

Effective teaching and learning of interdisciplinary subjects seldom turn to competency development in the subject. The reasons are not that justifiable but still there exists a lack of interest from the students' part. A teacher from a different department interacting with the students just for one course, the students assuming that this one subject is not going to make any difference in their career and hence just a pass in the subject alone will do to complete the course. The difficulty in learning an interdisciplinary subject without sufficient prerequisites etc. add to the ineffective learning process. Hence, innovative and time buying plans to be incorporated while teaching interdisciplinary courses.

The objectives of each of the modules were defined based on Bloom's Taxonomy, where the objectives for remembering, understanding, applying, analyzing, evaluating and creating were clearly indicated. A sample module objective is given in Table 1. The course delivery was planned to meet these objectives. As was mentioned earlier, the mechanical engineering students look at the electrical engineering subject as an alien one which is tough too. The first task is to create interest by correlating the need of electrical engineering knowledge in mechanical engineering applications. Assignments and tutorials were designed to address all the levels of cognitive taxonomy. The usage of technology has facilitated exercising all the levels of assignments. Simple tasks were shared through WhatsApp group and discussions were encouraged, which were extremely helpful in creating interest in the subject. In addition to this, peer teaching was adapted to help slow learners. Much more opportunities were given to the students to express themselves, which always remained exceedingly difficult with contact teaching, and has developed lots of confidence in the slow learners. This aspect was introduced by making the students explain the problem solution to the class, to fall in line with the affective domain of Bloom's taxonomy. Every student was given the opportunity to do this. Also, the assignment and test papers were evaluated by the peers to make them understand how their answers are evaluated by a third person. This was an exceptionally good exercise for the students to understand problem solution.

Table 1: A Sample Module objectives

Module 1: DC Circuits Objectives:
To Remember • the basic elements in electric networks • the terminology of Current, Voltage, Power, Energy, circuit elements, DC circuit • Definition of node, loop and mesh in a network
To understand • Ohm's Law- series and parallel circuits • Kirchhoff's law • Shortcomings in solving using KCL, KVL, Ohm's law • Node and mesh analysis • Network Theorems • Application of laws and theorems to solve circuits.
To solve Electric circuits using • Ohms Law Ohm's Law- series and parallel circuits • Kirchhoff's law • Node and mesh analysis • Network theorems Applications
To Apply the concept to design small electrical circuits
To Develop confidence in presenting a solution to the classmates. • Group activities

Method of Evaluation

A class of size 17 was the targeted group of Mechanical Engineering students to learn Electrical and Electronics Engineering during their second year, adapting technology driven teaching and learning, named as group A. The previous batch of students had taken up the same subject, and the classes were conducted in the conventional way via classroom teaching without any online or technology driven interaction or guidance, named as group B. Both the classes were taught by the same teacher. The assignments, tutorials and the class delivery content remained the same. A questionnaire was prepared using google forms to assess the efficacy of the method in terms of faculty access, sufficiency of content shared, presentation methods, assignments and tutorials, comparison with conventional class and online class and general feel about online classes. A similar study was conducted on 10 of the master's students in Nanotechnology, who come from different disciplines of undergraduate programs, teaching a course on Polymer Electronics. In both the cases, the control group is the previous year students who were taught by means of conventional classroom teaching. The teaching was done using google classroom/ canvas and interaction/communication with the students using WhatsApp group. In addition to this, peer teaching was adapted to help the slow learners. Much more opportunities were given to the students to express themselves, which was exceedingly difficult with contact teaching, and has developed lots of confidence in the slow learners. This aspect was introduced by making the students explain the problem solution to the class. Every student was given the opportunity to do this.

Comparison of the performance of the students in the final assessment was done to evaluate the effectiveness in learning process through technology aided teaching. Google forms were used to get feedback from the students regularly. The final goal of meeting the course objectives was also evaluated based on feedback from the students using google forms.

Discussion

Based on the students' feedback, it was observed that peer teaching, teacher availability

outside classroom, assignments/ tutorial using technology have helped them to achieve the course objectives effectively. Discussion of the assignments/ tutorials in the class, students explaining the solutions in the class and the opportunity to evaluate peers' work were the other activities which helped them learn the modules more thoroughly. The opinion poll on peer teaching is presented in Figure 1 for M.Tech and BS classes, on a scale of 1-5, 1 being the lowest and 5 being the highest. 44% have given the highest rating of 5, 39% rated 4 and 17%, rated 3 with none voting for 2 or 1. No student had a negative opinion about peer teaching. This shows that the performers and the weak ones are feeling happy about peer teaching. The one who solves the problem first in the class used to be given the opportunity to explain for the rest of the class. This was also an encouragement to the performers. The listeners were also encouraged to question the method followed. Similarly, 91% has rated the teacher availability beyond class hours as >4 as shown in Figure 2 and this was possible by using technology aids.

Figure 2 Teacher availability after class hours with technology aids

Though only 26.1% had voted for online classes being advantageous, the performance of the students proved otherwise. The low percentage voting for online classes was due to the difficulties they faced with the network connectivity in remote locations. All the classes were recorded and shared with the students which also virtually ensured 100% attendance for the teaching. The online tools support to maintain the deadlines for assignments and tutorials, which have assured that students do their work on time. Figure 3 shows the response on usage of online tools for assignment/ tutorials.

Figure 1: Opinion poll on peer teaching on a scale 1-5

Figure 3 Poll on Online tools for Assignment/Tutorial

From Figure 3, it is clear that the students found it more interesting to do the assignments and tutorial exercises when enabled with technology. Evaluation and maintaining the records, sending responses to students were also much easier with google classroom and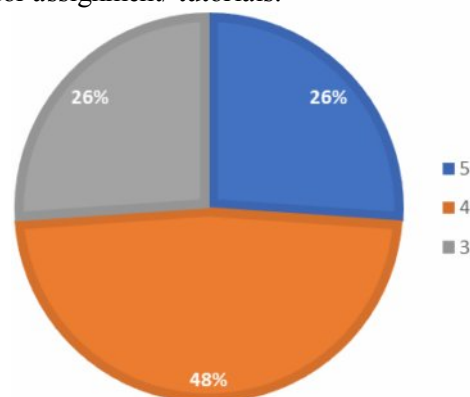 Canvas. The practices followed in this study was in line with Bloom's Taxonomy categorization as cognitive, affective and psychomotor to certain extent. Finally, a comparison of the outcome of the course is presented which is evaluated based on the academic results as shown in Figures 4 and 5. While all the students could fetch grades above 71% with online interaction and monitoring, the classroom.
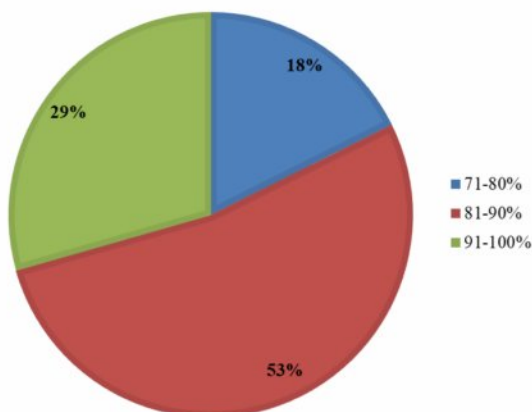

Figure 4: Mechanical Engg, Group A - Electrical Engineering results 2020- Online teaching learning.
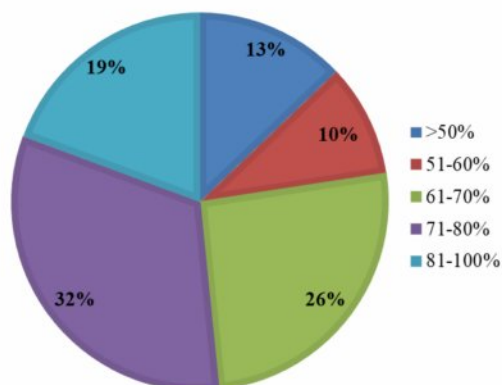
Figure 5: Mechanical Engg, Group B - Electrical Engineering results 2019- classroom teaching.

Teaching could make only 51% score grades above 71%. The final results of M.Tech class -Group A will be available only by November end, hence could not be presented here, and the continuous assessment marks are compared with group B as shown in Figure 6, where learning process made a drastic change.
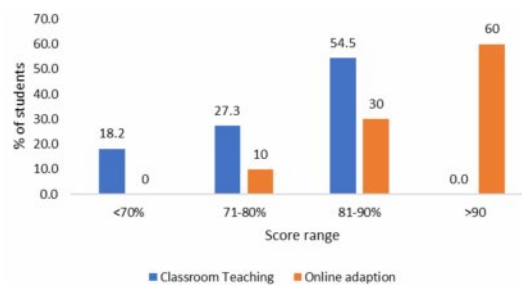
Figure 6: Comparison of Assessment marks Masters' program

Conclusion

Based on this experiment, it is concluded that while teaching an interdisciplinary subject, it is essential to encourage, create interest and motivate all the category of students equally. To achieve this goal, much of student centric activities need to be included while teaching. Contact hours allocated in the curriculum are not sufficient to incorporate all these and hence the technology driven tools should be drawn to our pedagogy. Curriculum is revised to meet the demand of job providers and the existing trend by incorporating interdisciplinary subjects, but the necessary means are to be adopted to train the students to develop interdisciplinary skills adapting technology aids. There is the need for preparation time for the fresh teachers in comparison to experienced

teachers. Induction programs are in place for new recruitment by way of faculty development activities, which are to be conducted as real workshops with demonstration opportunity given to the participants to impart transformational skill to the engineering graduates to take the challenges in a global platform.

Note: The data used in this paper is available in the controller's office and Institutes google classroom.

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India Higher Education Quality- Need of Reforms

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ABSTRACT

It's undeniably true that Exploration assumes a significant part in the monetary development of a country. Exploration alludes to an imaginative work which is embraced to in a precise way to build one's supply of information. With regards to instruction, it would allude to taking care of instructive issues in a logical and precise manner. The examination scene in India is a checkered one, while the renowned establishments and foundations of public significance are dominating in research, the fair and helpless ones are inadequate in the equivalent. The Indian Government has found a way various ways to advance examination. The meaning of exploration emerges from its advancement of innovative reasoning; discovering answers for looming issues in a deliberate, logical and all around resolved way; advancing further investigations in the space of revenue and staying informed concerning the most recent improvements in the chose field of study. Indian arrangement of instruction is portrayed by various limitations and exploration is one of the primary ones. Completing Exploration in India has various difficulties like shortfall of scholarly incitement, accentuation on repetition learning, absence of logical hypothesis and base, deficient information, absence of logical information, and preparing in Exploration Procedure. In the globalized world have information driven development controlled by advancement. Various advances could be executed to cultivate examination, for example, industry-the scholarly community coordinated effort, improvement of professional abilities, arrangement of more assets and consideration of exploration as a rule for personnel advancement. India has an all around acclaimed Mental ability and advancement Exploration will just assistance India climb the worldwide scholarly stepping stool..

Key words: Advanced education, Quality and Changes

Introduction

Examination accepts a fundamental occupation in the monetary improvement of any country. As a general rule, inventive work shapes the reason of future force of an economy. Unfortunately, research in India is seeming diving design. In this Paper an undertaking has been made to discuss research, break down the meaning of exploration, to address the assessment scene in India, examine the challenges and attempt to predict what's to come.

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Idea of Exploration

Exploration insinuates creative work which is endeavored purposely, to assemble the heap of data of individuals, culture and society and further utilize this stock to devise new applications. In the wide sense, it covers party of any data, information and convictions for the movement of learning. Improvement can be considered as the vital participant of financial turn of events and coming about upgrade in the idea of living. In this century, there is no vulnerability about the way that India has the capacity of starting overall headway, yet the unavoidable issue that ascents is will Indian high level training support this potential? The entire issue warrants an attentive talk. Examination in guidance insinuates dealing with educational issues in an orderly and sensible manner and besides to fathom, explain and anticipate human direct in a continuously figured out manner.

Examination in India

Preparing and instruction is a central player of the overall population. In order to decidedly utilize our measurement potential, the idea of guidance along with access and worth aggregates centrality. India has the third greatest game plan of high level training. The overall circumstance is that, quality doesn't organize the overall rules and there is extended expansion and criticalness for improving the idea of our country's educational establishments. The investigation circumstance in India portrays a checkered picture. While some driving top notch associations like the IITs and the IIMs are achieving what was especially organized in their objections others portray a dreary picture similar to quality and measure of exploration. The essential Head administrator of free India, Shri Jawaharlal Nehru, put confidence in the meaning of science and guidance which would empower a method of progressions, which in this manner would help during the time spent improvement. Generally India has fostered a significant number of astounding assessment foundations which would give productive appeal to the game plan makers. The institutional framework for creative work can be detached into 2 general classes: opposition and non military staff.

The five zenith bodies which are answerable for innovative work are :

a) Indian Committee of Clinical Exploration; It is the pinnacle body for the plan, coordination and advancement of bio clinical examination.

b) Indian Chamber of Farming Exploration; a self-governing body which directions directs and oversees examination and training in agribusiness including cultivation, fisheries and animal sciences.

c) Indian Committee for Sociology Exploration; It was set up in 1969 by the Public authority of India to advance examination in sociologies.

d) Gathering of Logical and Modern Exploration; It was set up in 1942 as a self-sufficient body and India's biggest Innovative work association. Its exercises incorporate different fields like air - space designing, primary designing, life sciences, climate and so on

e) Goodbye Organization of Principal Exploration. It is an Exploration organization in Mumbai devoted to essential examination in Arithmetic and sciences.

Significance of Exploration

The significance of examination can be rattled off as follows :

a. Our insight is restricted and various issues should be settled in various fields of study. All the time we distinguish a vacuum in our insight and attempt to address it by posing related inquiries. Examination through efficient investigation makes accessible an assortment of techniques which help in discovering arrangements.

b. Research is viewed as a goal, orderly, very much resolved logical technique for examination. Through research a supply of the flow situation can be taken and this will direct the associations in their choice taking of things to come.

c. We complete our commonplace day by day assignments based on our sound judgment. Notwithstanding, this may not be the right methodology. We should discover what is the awesome the flow circumstances and exploration serves this undertaking the best.

d. Another point of exploration is that it assists with social event data. The discoveries can be recorded and afterward broke down to pass judgment on the legitimacy of the data.

e. Research is a precise agent into and investigation of materials and sources. It assists with pursuing your inclinations, discover some new information, sharpen your critical thinking abilities and come out with results that can add to improvement of information.

f. Practice of exploration adds profundity to investigate papers as understdies are stayed up to date with the most recent data. Through gaining from genuine contextual investigations and by looking for the direction of employees assist understudies with getting date data. In this universe of Data and Correspondence Innovation absence of framework and low quality of advanced substance are justification for concern. For making a sound ICT climate, digitized PhD postulation, e-diaries, research diaries, digital books and so on must be created.

g. It is crucial that instructive foundations build up an Exploration Consultancy culture including staff, understudies, experts and industry to chip away at a couple of advances and work with disclosure. Examination ought to be the center region instrumental for between face between the scholarly and corporate world.

It should give a hypothetical system that empowers reassessment and refinement of current practices and thinking. It enables the personnel with inside and out information and imparts a feeling of interest among them. Furthermore it further develops the consultancy capacities of the personnel.

Difficulties to Research in India

The Indian plan of high level training has been going up against different troubles. It requires genuine theories to make HR productive, by coupling the more settled general controls of humanities, social sciences, trademark sciences and exchange, with their applications in the new economy and having good field base agreement to redesign learning with aptitudes and make reasonable outlooks. There are a couple of fundamental issues facing Indian high level training as of now .

They join lacking infrastructural workplaces; staff crunch; low enrolment extent; pressed study halls; in all cases geological compensation, sex and ethnic unbalanced attributes, etc. India has a low base of investigators and the academic part offers under 14% of the hard and fast number of researchers. The brief need in this setting would be, to help industry-the insightful local area joint endeavors, advance facilitated endeavors between the universities and individuals in everyday experts as also between the governing body and Innovative work labs and moreover increase the number and nature of doctoral understudies. The Indian guidance system propels redundancy learning and understudies simply use embraced materials . This example continues despite while pursuing high level training. The assessments are more a preliminary of memory control instead of imagination. Exactly when the stage comes to pursue further assessments and present examination papers, they portray a grim picture hampering the investigation strategy related with high level training. As the understudies are denied of insightful instigation empowered by research, they come up short with respect to valuable data and capacities which are essential in their callings just as in various regular issues. Undoubtedly, even the amount of understudies pursuing exploration is compelled by need of time, and backing. The result being them ending up terrified, overwhelmed and perplexed. One of the central hindrances is nonappearance of consistent speculation. An enormous number of the experts are unequipped for accomplishing sound exploratory work; data is habitually missing and despite when available not profited of; what's more the issue of administrative inertness is consistently torturing

the structure. Consistently there is nonappearance of coherent data and getting ready in Exploration System. Countless our researchers and helpers are not adequately prepared to accomplish sound definite work.

The accompanying components can be supposed to be empowering acceptable exploration:

1. A favorable climate of the organizations/ colleges;

2. An all around loaded library and Reference area covering books, digital books, diaries, online library and so on;

3. Arrangement of satisfactory infrastructural office;

4. Presence of Exploration research facilities having the most recent supplies;

5. Accessibility of satisfactory money for acquisition of assets;

6. Joining educating and research related action in the work profile of the Educators;

7. Ingraining a sensation of pride and intentionality among educators that their significant assignment is to change of the economy.

Eventual Fate of Exploration in India

In the unquestionably engaged overall economy, have learning driven improvement constrained by headways. The best approach to continued with progress for India is creating of a high level training system which is unmatched in quality and which supports investigate. Constantly, it is the business which is the beneficiary of a couple of examination attempts and appropriately relationship among industry and exploration establishments is basic. In the recurring pattern age where issues

of exploration are routinely of overall nature dynamic coordinated effort with all inclusive establishments of reputation should be stimulated. Proficient aptitudes should be highlighted. Proficient getting ready will accept a fundamental occupation setting up the labor force to be gainfully used to push the improvement system of the economy. There are creating energy for interfacing aptitudes and high level training portion. While making an enabling area, note should be made of decreasing the appearance hours, more critical cash related assistance and offering admittance to better structure. Giving of co-tasks and engaging industry facilitated endeavors will propel research. Exploration can be progressed by keeping certain guidelines, for instance, fuse of examination as a model for faculty with the ultimate objective of headway, (a system set some place close to UGC and is as of now been followed by related schools and universities); establishment of respects for perceived experts with liberal cash related spurring powers; period of more vital financing; improvement of establishment; and possible diminishing of preparing hours so extra time can be given to investigate. India has all the ability of being an

investigation community point given her long show of instructing and renowned Mental aptitude. The obstructions need to took care of to straightforward the best approach to monetary prospering.

Conclusion

Exploration as we have seen accepts a basic occupation in the money related improvement of a country, even more so if there ought to emerge an event of a making country like India. We stand up to different constraints, as not all around stacked libraries, nonappearance of particularly pre-arranged examination communities, nonattendance of acceptable asset, government intervention, etc. In context of the way that we have an overall perceived Mental aptitude, the need critical is for improvements and manifestations. India exceptionally regards making Nobel Laureates of Indian origin. The innate capacities of our examiners should be upheld and developed to make a check in the overall field. This calls for more significant money related assistance, right game plan join with working on finding answers for the debilitating issues torturing the Indian culture, if we should be seen as a vital part in the overall world.

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New Education Policy 2020 Major Challenges in Telangana State

Kandi Kamala*

ABSTRACT

The coverage that has stood out for introducing sweeping modifications in school and higher education is a boon for Telangana wherein it will improve getting to know effects, in particular for socially and economically prone college students. it is important to understand the overall performance of Telangana in training. The overall performance grading index utilized by the ministry of education ranks Telangana at 17 out of the 37 states and Union territories in 2018-19. The huge-based totally metrics protected learning effects and high-quality, get entry to, equity, infrastructure and centers, and governance approaches. Telangana become ranked 30th in infrastructure and centers and 20th in access. it is for that reason vital for Telangana, that is financially properly endowed, to put in force the NEP. The NEP is familiar with the critical importance of exact exceptional childhood care and education (ECCE). specialists accept as true with that over 85 in line with cent of infant's cumulative mind development occurs prior to the age of six. through bringing ECCE to the centre of training with an explicit recognition on building foundational and numerical capabilities for every baby via give up of Grade 3, a quantum improvement in getting to know effects is anticipated. Telangana has at the least 10 districts with scheduled areas and kids belonging to Lambada, Koya, Gond, Yerukala, Chenchu and different groups will stand to gain. one of the motives for negative infrastructure and facilities of faculties is loss of budget with states. It also objectives to beautify get admission to by means of organising higher education institutes (HEI) in aspirational districts and unique schooling zones containing large numbers of social and economically deprived corporations. by way of 2030, the NEP targets to have at least one large multidisciplinary HEI in/close to every district. Aspirational districts in Telangana inclusive of Jayashankar Bhoopalpally, Kumarambheem Asifabad and Khammam will benefit. Telangana has a Gross Enrollment Ratio (GER) of 36.2 in keeping with cent. The NEP troubles a formidable name for boosting GER in higher training including vocational training to 50 according to cent via 2035.
Key words: NEP.GER.HEI.GDP, RTE, MERUs

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Introduction

The NEP also aims for a holistic, comprehensive education as it breaks down prevailing insularity by introducing the 5+3+4+4 system of school education. The NEP further strikes the right chord in terms of equity and access. Schools are often regarded as the second home in a child's life and this will thus, in turn, build an inclusive and empathetic society. In both domains of school and higher education, the NEP has opted for restructuring of the system in terms of curriculum, pedagogy and recreational opportunities to prevent any form of exclusion or isolation of disadvantaged communities. The NEP aims to provide food and nutrition in terms of breakfast and midday meals in government schools. This will encourage parents of children, who often have to make their child work for their next meal, to send them to school.

The NEP stipulates the Centre and states work together to increase public investment in the education sector to six per cent of GDP. The Telangana state government's budget allocations to education for the 2020-21 fiscal saw a reduction from previous allocations. This is of major concern given that data recorded by the 2011 census shows Telangana's literacy rate as 66.4 per cent, much below the national average of 74.4 per cent. Lastly, the NEP has proposed sea changes in higher education that will better align with the needs of a changing employment market.

Another striking example to improve equity is the attempt to include the mother tongue as the medium of both educational and vocational education. By including regional languages, in this case Telugu, as a medium of instruction, NEP 2020 strives to focus the child's energies on learning concepts rather than a new language. The NEP also acknowledges special mechanisms required to ensure that children belonging to tribal communities receive the benefits of these interventions. The decision to promote tribal languages will contribute to their educational empowerment.

Implementing NEP 2020 in Telangana State: Concerns and Challenges Implementing the NEP 2020 in Telangana involves ensuring the universal access to pre-primary to higher secondary education in the state. The new pedagogical and curricular structure of NEP 2020 has underscored the critical aspect of pre-primary education (for 3.6 years of age children) which has been undermined in the country for a long. Pre-primary and School Education Regarding this pre-primary education, universal provisioning of quality early childhood development, care and education is to be achieved by 2030. In this regard, more than 95 per cent of 3-6 years' age children (rural areas) in the Telangana state (as per the estimates of ASER 2018) are enrolled either in ICDS/Anganwadi centres (AWCs), in institutions for pre schooling or in any formal primary schools (govt. or private). But what percentage of them and to what extent they are imparted with pre-school curriculum (education) in these centres especially AWCs is a matter of concern. There are more than 35000 Anganwadi Centres across villages and habitations in the state and they are meant for providing all the ICDS or Anganwadi services. Although pre-school education (informal) is one among the six component package of ICDS/Anganwadi services, it appears that pre-school component is little neglected across ICDS centres not only in Telangana state but also all over the country. Around 70 per cent of children of 3-years age,

50 per cent of 4-years age and 20 per cent of 5- years age are enrolled in Anganwadi Centres.

If these centres are not able to provide comprehensive pre-school education for the holistic development of children, they would be deprived of it. Therefore, the mandate for the government of Telangana in implementing NEP 2020 is ensuring all the children in the age of 3 to 6 years not only access to pre-primary education but also to make them attend the same. It involves the implementation of National Curricular and Pedagogical Framework for Early Childhood Care and Education (NCPF-ECCE) Curriculum Framework across all the institutions (private and government including Anganwadi Centres) involving in imparting pre-primary education. Ensuring delivery of the services of pre-primary education for children in all these institutions with trained teachers and following norms would be a challenge. As a large chunk of children of pre-school age are enrolled in Anganwadi centres, training and capacity building of Anganwadi teachers along with equipping the centres with required materials is critical. Mobilisation of resources for these additional costs is another challenge for the state government. Further, the convergence across associated departments is also a major challenge as the planning and implementation of ECCE has to be carried out jointly by Ministries of Education, Health, Women & Child Development, and Tribal Affairs. School Education Telangana state is close to constitutional mandate of ensuring all the children of 6-14 years of age attend schools. Further, education is now a fundamental right of every child under Right to Education (RTE) Act 2009. Around 98 per cent of children in 6-14 years in the state are attending school.

Yet there is a gap, two per cent of children in this age-group are still remained out of school. The state government has a greater responsibility to ensure that right of every child in the state is realized by not only ensuring universal access itself but also attaining universal enrolment and attendance. Among the secondary school-age children (15-17 years of age) the attendance rates in the state are more than 90 per cent. It is higher than national average and perhaps many other states. The mandate for the government of Telangana in implementing NEP 2020 is not only ensuring access to schooling along with attendance of all the children but also ensuring the delivery of quality education with improved learning-outcome to match with the expected outcome. First of all, in spite of high attendance rates the over-age and under-age children in different levels of education and in different grades / classes of school education (primary to higher secondary) is more prevalent in the state. As a result, the performance of Telangana state in the all India context in respect of net enrolment ratio (NER) by levels of school education (primary, middle, secondary and higher secondary) is little lagging behind when compared to its performance in respect of attendance rate among the children in the age group of 6-17 years which is appropriate for whole of school education. In this regard, streamlining enrolment and attendance of children in the state into the age-appropriate levels of education and age appropriate classes should be the major concern.

Most importantly integrating the whole of the school education system in the state is the need of the hour. Telangana and Andhra Pradesh are among the very few states in India maintaining separate administrative

structures for both school educations up to low secondary and higher secondary (junior colleges) under collegiate education. Although the Telangana state has adopted the national strategy for school education i.e. Samagra Shiksha, it is yet to integrate junior colleges with school education. As NEP 2020 is concerned with the Foundational Literacy and Numeracy (FLN), it is definitely an urgent and necessary prerequisite to learning in the state as well as at the national level. Quality of education is cause of concern in the country and in Telangana state (see Reddy, 2019). ASER and NAS reports have shown the learning deficit or learning poverty (in World Bank terminology) in the school education. Primary education is an indispensable foundation for next levels of education and lifelong learning. In this stage, child acquires basic skills in numeracy and the necessary ability to read and write. As the surveys indicate many children are not able to demonstrate expected levels of learning outcomes / grade level competencies. In this regard, while implementing the NEP 2020, the Govt. of India is going to launch National Initiative for Proficiency in Reading with Understanding and Numeracy (NIP RUN) in a mission mode. It is important to identify and understand the extent of learning gaps and associated factors and to devise various strategies keeping in view the circumstances and diversities across districts in the state. Filling vacancies with qualified teachers is a part of the solution but beyond that the teachers' accountability and their training in accordance with requirement is critical in filling the gaps while attaining the expected learning outcomes.

Two examples one can cite is the performance in this respect is the schools under TSWREIS in Telangana state and also the public schools in Delhi. Scaling up the model performance and achievement of TSWREIS in Telangana, covering all the public institutions, is a challenging task for the government but not impossible. Initiatives with no major budget implications like active involvement of various stakeholders especially the school management committees (SMCs), parents and community which is critical in monitoring and tracking the students' progress in achieving expected learning-outcomes, and the required training and awareness drives are noteworthy in this context. To keep a regular check on education system, Govt. of India proposed in NEP 2020 to setup national assessment centre: Performance, Assessment, Review and Analysis of Knowledge for Holistic Development (PARAKH). Also the World Bank is initiating a project for the purpose: Strengthening Teaching-Learning and Results for States (STARS). To tackle the learning losses due to school closures (like in the present Covid-19) or any emergency situation, the STARS project include a component: Contingency Emergency Response Component (CERC). The government of Telangana can take lead in this respect with developing its own strategies for improving the quality of education. Higher Education: General, Vocational, Technical and Professional as the NEP 2020 aims, implementing the policy in the state involves achieving the target 50% GER by 2035 with institutional restructuring and consolidation (a minimum of 3000 enrolments in each HEI), and transforming the state higher education system into a new and forward looking one with quality universities and colleges during the period of next 15 years.

The GER for higher education in

Telangana state at present is 36% which is ten percentage points higher than national average. It appears to be that the Telangana state has an advantage of easily achieving the NEP 2020 target of 50% GER earlier than other states. However, increasing privatization of higher education, as it is seen, in the state has imperative for increasing private expenditure which has implications for affordability that may slow down the growth in enrolment and GER. In a study such a deceleration in growth of enrolment at the national. Consolidating the higher education institutions is a very big challenge not only in Telangana state but also across the country. There are almost 2000 HEIs along with more than 500 standalone institutions (such as polytechnics, teacher training institutes, diploma course level pharmacy and nursing colleges etc.,) in Telangana state. Keeping existing HEIs as they are and expanding their size to larger institutions, as envisaged in the policy, is not possible in near future. Many HEIs are sub-optimal in size and most of them do not have any prospects to grow large in size and the resources required.

Further, almost 80% of HEIs in the state are under private management, in most of the cases each entity (institution) has different individuals, trusts or organisations that are managing them. Bringing them together is also a difficult task. Although the acquisition and merger of the individual HEIs (in terms of their management) is facilitated and made possible, most of them (HEIs) are functioning in different locations. A large proportion of HEIs in the state are concentrated in and around capital city of Hyderabad or other major cities and district headquarters, but they are not located in geographical proximity. Geographical compactness of each of large HEIs is the underlying principle of consolidation proposed in the NEP 2020. Hence, making each of consolidated institutions (by management) as a single large HEI in one place (geographical location), is not possible through this acquisition and/or merger. One strategy could be facilitating expansion of selected potential institutions by consolidation while withdrawing/ closing down altogether the other institutions. Resources and catchment of closed institutions have to be diverted to those continue to exist.

Here the geographical distribution of HEIs in the state would be another major concern in the process. As NEP 2020 envisages consolidation is also involving with restructuring of the HEIs running a single programme, course or discipline institutions into multi-disciplinary ones along with restructuring of all these multi-disciplinary HEIs into universities of teaching and/or research and autonomous colleges. Except universities and some general education institutions (degree colleges) most of technical and professional HEIs in the state are specialized ones running single programmes. There are around 200 engineering colleges, 300 colleges for management courses, 200 B.Ed. colleges and 100 pharmacy colleges in the state. It may be said that nearly half of the HEIs in the state are of this nature (not of multi-disciplinary ones). Around 1050 are the degree colleges in the state, most of which run under-graduation programme with multiple courses in different disciplines (Science, Arts, Humanities and Computes). Most of colleges (HEIs) in the state are of affiliated nature. First of all, the government of Telangana has to mull its efforts streaming the B.Ed. programme into four years programme and making it as a part of university system, as envisaged in the NEP

2020. It means that all the individual B.Ed. colleges in the state may have to be closed down and ensuring a smooth transition from the present two-year course into a four-year one during the next couple of years. A thread connecting to the above is the setting up model Multidisciplinary Education and Research Universities (MERUs) at least one for each district (as envisaged in the NEP 2020) and resource mobilization for the same is a great challenge in the state.

There are 33 districts in the state and hence that many model MERUs are to be setup in principle. But how it is dealt with, whether the existing institutions/universities in a district would be converted into model MERU for the district or altogether a new one would be set-up is an issue to be thought over. Again in the process of conversion issues like the required resource mobilization, management of public sector or private, or in public-private partnership (PPP) mode would crop up. Leaving it to any private initiatives have repercussions for growing private expenditure on education and affecting affordability especially in backward districts and for students belonging to economically backward classes in accessing educational opportunity in such premier institutions. Establishing so many model MERUs under public system would be burdensome for the state budget. Already existing higher education institutions under the public sector have been affected by financial crunch in state's higher education budget. Financing Education as the report of Analysis of Budgeted Expenditure on Education that compiled by Ministry of Education (MoE), Government of India, shows the expenditure on education in Telangana state comprises nearly 19.5 per cent of total budgeted expenditure of the state (Revenue Account) and 2.8 per cent of its Gross State Domestic Product (GSDP), for the year 2017-18. One must herein note that the report that is compiled by MoE (Govt. of India) covers more comprehensively all the expenditure on education across departments and ministries beyond the education department (see Motkuri and Revathi, Sep 2020). To compare with the other south Indian states, Kerala (4.2% of GSDP, 23.6% of State Budget) and Tamil Nadu (3% of GSDP, 25% of state Budget) along with Maharashtra (30% and 3% respectively) appears to have a better resource allocation for education than that of Telangana.

When budgets all the states are combined/aggregated (excluding Union Budget), the expenditure on education turns out to be 22.8% of total budget and 3.4% of GDP. Whereas at the national level, Centre (Union Govt.) and all the state governments together have spent 16% of the total budgeted expenditure of the country and 4.2% of GDP on education (see Motkuri and Revathi, Sep 2020). The government of Telangana needs to increase its resources allocation for educational development in the state. The Kothari Commission recommendation of 6% of GDP to be spent on education is applicable at the national as well at state level. The achievement of Government of Telangana is short of even the half-way mark in reaching goal of 6%. In this regard, as a short-term strategy it may have to increase the expenditure on education to at least 4% of GDP.

Conclusion

The new education policy has a laudable vision, but its influence will depend on whether it is able to effectively merge with the government's other policy initiatives Digital

India, Skill India and the New Industrial Policy to name a few in order to effect a coherent reconstruction. For instance, policy linkages can ensure that education policy speaks to and learns from Skill India's experience in engaging more dynamically with the private sector to shape vocational education curricula in order to make it a success. This paper while analyzing the status of educational development in the Telangana state, critically examined the recent National Education Policy (2020) in general and its implementation process and challenges in the state of Telangana. The analysis brings out certain contradictions in the policy, issues and challenges in realizing aim of the policy. Overall, NEP 2020 although gauged to a greater extent the problems, issues, and challenges with respect educational development in the country, its approach and policy in addressing them would turns out to be challenging especially financial allocation. The analysis also brings out the certain issues in different aspects of across levels of education system (pre-primary, school and higher education) and challenges while implementation of the policy (NEP 2020) in the Telanagana state. It is observed that the consolidation and restructuring of HEIs in the state along with setting of model MERUs would be a challenge in the state. More importantly, the financial resources allocated to the education found to short of requirement and hence to be increased. It also brings forth the imperative to strengthening of public education system.

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A Study of Male and Female Students of Secondary Schools in terms of Creativity

Harendra Singh*

ABSTRACT

The Present paper focused on the comparison of the creativity of male and female students. The main objectives of the study were (i) to compare the creativity of male and female students of secondary schools, (ii) to compare the fluency of male and female students of secondary schools, (iii) to compare the flexibility of male and female students of secondary schools, and (iv) to compare the originality of male and female students of secondary schools. For this study, 100 students were selected as a sample. A Creativity Test (Hindi Version) developed by Dr. Narendra Singh Chauhan was administered to the sample. Raw data were statistically treated with Mean, Standard deviation, and t-test. The finding of the study revealed that (i) male students studying in secondary schools are more creative than female students studying in secondary schools, (ii) male students studying in secondary schools excel in fluency, a dimension of creativity from female students,(iii) male and female students studying in secondary schools were more similar concerning their flexibility, a dimension of creativity, and (iv) female students studying in secondary schools have more originality, a dimension of creativity than the male students.
Key words: Creativity, Fluency, flexibility, Originality

Introduction

Education plays a significant role in promoting social and national integration, which is crucial to the creation of a strong and united nation. Education should earnestly strive to deepen national consciousness and to inculcate proper pride in our cultural heritage and faith and confidence in the great future, which we can forge for ourselves. The quality of life and pace of development of any nation depend on the ideological climate, the widespread perceptions of history, culture, tradition, and values; and the feeling of confidence in human capability to overcome material, social and spiritual problems of living.

Secondary education constitutes an important stage of education. Secondary education should aim at self-expression, good human relations, and increases in social efficiency and civic responsibility. Secondary education begins to expose students to the differentiated roles of science, the humanities, and social sciences. This is also an appropriate state to provide children with opportunities to understand their constitutional duties and rights as citizens.

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The education after the VIII Class and before higher education is termed secondary education. Secondary education is education meant for those who have not yet proceeded to university. It is the education that is suited to the requirements of all pupils who have completed primary education and have not qualified for admission to a certificate, diploma, or degree course instituted by the university or by the government. As per the national system of education suggested in the previous National Policy of Education, Secondary education should be of four years. In the 10+2+3 pattern, the 9th,10th, 11th, and 12th classes are called secondary education and termed secondary and higher secondary classes. Higher Secondary Education should be taken as school education and should be outside of the preview of higher education.

The main aim of education is to provide equal opportunities for the development of potentialities of individuals to contribute to the development of the nation. But having so many individual differences among the students of a normal classroom, it is very difficult to attain the particular aim of education. Creativity is very important in education as it helps in the emotional development of an individual. A wave of emotion can also help facilitate creative expression in a child, a student, and even in an adult.

According to Alder (2002); Jensen et al (2010), creativity helps to orient students' future careers and is the basis for teachers to change teaching methods to suit each group of subjects, improving creativity for learners. In Vietnam, according to Tran Thi Bich Lieu (2016), teachers still have limited understanding and teaching about creativity. They focus more on creativity when it is required by policies and curricula and often use familiar and convenient creative tools.

Creativity allows us to view and solve problems more openly and with innovation. Creativity opens the mind. A society that has lost touch with its creative side is an imprisoned society, in that generations of people may be closed-minded. It broadens our perspectives and can help us overcome prejudices.

Creativity is an essential element when it comes to the overall development of students. Classrooms are one ideal places where teachers get to inspire kids to use their imagination when it comes to learning. The right mix of creativity along with curriculum helps students innovate and also encourages them to learn new things easily. Creative classrooms can really transform the way students grasp knowledge and influence how they apply it in their real life. In fact, creative expression plays a key role in a student's emotional development. It makes them good communicators and improves their emotional and social skills.

Education is the only instrument by which a nation transforms itself from what it is into what it hopes to be. From a layman's point of view, there is not much difference in the achievement level of the male and female students. But it is striking to mention here that the final board examination declared by various state boards or CBSE or ICSE reveals that quite a good number of female students are in the top ten lists. So far as the best scholars of secondary schools are concerned male students lag behind female students. This phenomenon inspires the present researcher to concentrate on possible factors that are responsible for such differences in achievement levels among male and female students.

Terms Used in the Study

The following terms used in the study:

Creativity

A Process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on, identifying the difficulty, searching for solutions, making guesses or formulating hypotheses and possibly modifying and retesting them, and finally communicating the results. (Torrance, 1966)

Verbal Fluency

This score is an indication of an individual's ability to produce a large number of ideas with words.

Verbal Flexibility

This score is an indication of an individual's ability to produce a variety of ideas with words.

Verbal Originality

This score is an indication of an individual's ability to produce unusual ideas with words.

Figural Fluency

A score reflects the test taker's ability to generate a large number of ideas figurately.

Figural Flexibility

A score that represents the test taker's ability to produce a variety of ideas figurately which may be classified into qualitatively different categories, to sift from one approach to another or employ different strategies.

Figural Originality

This score indicates the test takers' ability to produce ideas, represented figurately which differ from the normatively dominant responses to the rest of stimuli, and novel responses displaying imagination and divergence from the commonplace.

Statement of the Problem

The statement of the problem has been stated as, "A Study of Male and Female Students of Secondary Schools in terms of Creativity".

Objectives of the Study

Every research work is written with some objectives, goals, or purpose. The present research study has also certain objectives as has been outlined below. The specific objectives of the study were:

(i) To Compare the Creativity of Male and Female Students of Secondary Schools.

(ii) To Compare the Fluency of Male and Female Students of Secondary Schools.

(iii) To Compare the Flexibility of Male and Female Students of Secondary Schools.

(iv) To Compare the Originality of Male and Female Students of Secondary Schools.

Hypotheses of the Study

To achieve the objectives the following non-directional hypotheses were formulated for the present research-

(i) There is no significant difference between the Creativity of Male and Female Students of Secondary Schools.

(ii) There is no significant difference between the Fluency of Male and Female Students of Secondary Schools.

(iii) There is no significant difference between the Flexibility of Male and Female Students of Secondary Schools.

(iv) There is no significant difference between the Originality of Male and Female Students of Secondary Schools.

Delimitations of the Study

The study was delimited to the creativity factors of 50 male and 50 female students of secondary school students studying in class IX of the Meerut district public schools.

Method Used in the Study

The study was interested to know the present status of the creativity of male and female students. Therefore, the survey method of the research was used by the researcher in the study.

Population and Sample of the Study

The subjects who participated in the study were chosen from the class IX students of the Meerut District. The population was of students studying in class IX, which is affiliated with C.B.S.E. Delhi. This is the western area of Uttar Pradesh. Sample of the Study In the present study 50 Male and 50 Female students were selected for the sample studying in the secondary schools situated in the Meerut district.

Sampling Technique Used in the study

A simple random sampling method was applied in selecting the sample of the study. The sample was done on two groups of students i.e., male students and female students of IX class. Both groups were selected randomly.

Tool Used in the study

The tool used in the present study is the Creativity Test (Hindi Version). It is developed by Dr. Narendra Singh Chauhan.

Statistical Techniques used in the Study

For the present study, the Mean, Standard deviation, and t-test, etc. statistical techniques were used for the analysis of data.

Analysis and Interpretation of Data

Table-1: Comparison of the Creativity of Male and Female Students of Secondary Schools

Groups	N	M	SD	't' Value	Level of Significance
Male Students	50	114.16	12.48	3.67	Significant at .01
Female Students	50	105.50	11.04		

df = 98, (Table Value: .05= 1.98 and .01= 2.63)

Interpretation & Discussion: Table 1, shows that obtained 't' value of 3.67 is significant at a .01 level of confidence for df. of 98. Obtained 't' value is more than the minimum significant t value of 2.63 at the .01 level. The significant 't' value shows that the creativity of male students differs significantly from the creativity of female students. The mean value of creativity of male students shows their superiority over the mean value of creativity of female students. On the basis of the finding, it can be said that male students in secondary schools are more creative than female students of secondary schools.

Table-2: Comparison of the Creativity of Male and Female Students of Secondary Schools in Terms of Fluency

Groups	N	M	SD	't' Value	Level of Significance
Male Students	50	50.5	5.127	2.978	Significant at .01
Female Students	50	47.36	5.410		

df = 98, (Table Value: .05= 1.98 and .01= 2.63)

Interpretation & Discussion: Table 2, shows that obtained 't' value of 2.97 is significant at a .01 level of confidence for df. of 98. The obtained t value is more than the minimum significant 't' value of 2.63 at the .01 level. Significant 't' value shows that the creativity of male students differs significantly from the creativity of female students in terms of fluency. The mean value of creativity (in terms of fluency) of male students shows their superiority over the mean value of creativity of female students. On the basis of the finding, it can be said that male students of secondary schools are more creative than female students of secondary schools in terms of fluency.

Table-3: Comparison of the Creativity of Male and Female Students of Secondary Schools in Terms of Flexibility

Groups	N	M	SD	't' Value	Level of Significance
Male Students	50	17.54	3.75	0.081	Not Significant
Female Students	50	17.48	3.57		

df = 98, (Table Value: .05= 1.98 and .01= 2.63)

Interpretation & Discussion: Table 3, shows that obtained t value 0.081 is insignificant even at a .05 level of confidence for df. of 98. The minimum required significant 't' value is 1.98 at a .05 level of confidence. Obtained 't' value is less, which means two groups namely male students of secondary schools and female students of secondary schools do not differ significantly on their scores of creativity in terms of flexibility. The observed difference in the mean scores of the two groups is not a real one. It is due to sampling error.

Table-4: Comparison of the Creativity of Male and Female Students of Secondary Schools in Terms of Originality

Groups	N	M	SD	't' Value	Level of Significance
Male Students	50	13.9	3.71	3.62	Significant at .01
Female Students	50	16.26	2.72		

df = 98, (Table Value: .05= 1.98 and .01= 2.63)

Interpretation & Discussion: Table 4, shows that obtained 't' value of 3.62 is significant at a .01 level of confidence for df. of 98. Obtained 't' value is more than the minimum significant 't' value of 2.63 at the .01 level. Significant 't' value shows that the creativity of male students differs significantly from the creativity of female students in terms of originality. The mean value of creativity (in terms of originality) of male students shows their superiority over the mean value of creativity of female students. On the basis of the finding, it can be said that male students of secondary schools are more creative than female students of secondary schools in terms of originality.

Validation of Hypotheses

Hypothesis No. 1- States that, there is no significant difference between the Creativity of Male and Female Students of Secondary Schools. With regard to hypothesis No. 1, the 't' value is 3.67, which is significant at a .01 level of significance. It indicates that male and female students studying in secondary schools differ significantly in their creativity. Thus, null hypothesis no. 1 is rejected.

Hypothesis No. 2- States that, there is no significant difference between the Fluency of Male and Female Students of Secondary Schools. The obtained 't' value regarding hypothesis No. 2 is 2.97, which is significant at a .01 level of significance. It indicates that male and female students studying in secondary schools differ significantly in their creativity in terms of fluency. Thus hypothesis No. 2 is rejected

Hypothesis No. 3- States that, there is no significant difference between the Flexibility of Male and Female Students of Secondary Schools. The obtained 't' value regarding hypothesis No. 3 is 0.081, which is insignificant at both levels of significance. It indicates that male and female students studying in secondary schools do not differ significantly in their creativity in terms of flexibility. Thus hypothesis No. 3 is accepted.

Hypothesis No. 4- States that, there is no significant difference between the Originality of Male and Female Students of Secondary Schools. The obtained 't' value regarding hypothesis No. 4 is 3.62, which is significant at a .01 level of significance. It indicates that male and female students studying in secondary schools differ significantly in their creativity in terms of originality. Thus hypothesis No. 4 is rejected

Conclusions

On the basis of the findings following conclusions have been drawn-

1. The study revealed that male students studying in secondary schools are more creative than female students studying in secondary schools.

2. The male students studying in secondary schools excel in fluency, a dimension of creativity from female students.

3. The male and female students studying in secondary schools were more similar in relation to their flexibility, a dimension of creativity.

4. Female students studying in secondary schools have more originality, a dimension of creativity than male students.

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* Malik, A.P. (1998) Education Policy and Perspective. New Delhi: Allied.

* Majumdar, Ramesh (1997) "The Role of the Society", Journal of Educational Views, 1 (3 & 4), July-October, pp. 1-11.

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