CONSTRUCTION, VALIDATION AND STANDARDIZATION OF GENERAL SELF-CONFIDENCE SCALE

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ABSTRACT

The main aim of this study was to construct and validate General Self-confidence Scale. The scale consists of total 16 (8 positive and 8 negative) Likert type items namely Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree. The preliminary instrument consists of 20 Likert type items was tested on 260 students. After the refinement of items using different procedures, only 16 items were selected. The construction and development of the test was done by expert review, preliminary draft, item analysis, selection of items, preparation of final test, norms, validity and reliability of the test. The Cronbach's (α) and split-half reliability of the test as found 0.866& 0.862 respectively. The intrinsic and criterion validity of the test was found to be 0.930& 0.770.Thus, scale is highly reliable and valid for measurement of self-confidence among students.

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Keywords: Construction, Reliability, Self-confidence, Standardization and Validity.

Introduction

Confidence is a belief in oneself, the conviction that one has the ability to meet life's challenges and to succeed—and the willingness to act accordingly. Being confident requires a realistic sense of one's capabilities and feeling secure in that knowledge. It,is the greatest gift that we can give to the other individuals or students. The students with physical disabilities, learning difficulties and motor skills difficulties face a lack of confidence in the class. The students with a high confidence can achieve success in their life. It is a tool that helps individuals or students to manage their problems, challenges, fears and maintains a positive attitude. A confident individual is happy and fruitful and can face every problem that comes in his life. The extent to which an individual is confident of his abilities also seems to be an important factor in conformity to social pressures persons who have confidence in their own judgments are more resistant to pressures to conform than those who do not have this confidence Intelligence and confidence in one's own abilities determine the extent of conformity.

'Self-concept' might not be a term you're generally familiar with, but it's one that's well worth knowing about. It essentially refers to the way we think about ourselves, evaluate our appearance, thoughts, and behaviors, and perceive ourselves both as individuals and in comparison, to others. It's also linked to concepts of self-awareness, self-esteem, and self-image.

Basically, it is a psychological and social phenomenon in which an individual evaluates him/ herself according to some values which may result in different emotional states, and which become developmentally stable, but are still open to variation depending on personal circumstance. Self-confidence is a positive attitude of oneself towards one's self-concept. It is an attribute of perceived self. Self Confidence refers to a person's perceived ability to tackle situations successfully without leaning on others and to have a positive self-evaluation. A self-confident person perceives himself to be socially competent, emotionally mature, intellectually adequate, successful, satisfied, decisive, optimistic, independent, self-reliant, self-assured, forward moving, fairly assertive and having leadership qualities. Self-Confidence is a state of mind which permits people to have constructive yet sensible perspective of themselves and their circumstances. Self-Confident individuals believe their own particular capacities, have a general feeling of control in their lives, and trust that, inside reason, they will have the capacity to do what they wish, arrange and anticipate. Having confidence does not imply that people will have the capacity to do everything. Self-Confident individuals have desires that are practical (Ampadu, E. 2009). Notwithstanding when some of their desires are not met, they keep on being sure and to

acknowledge themselves. The term Self-confidence is utilized to allude to individual's judgments about themselves. Youngsters with over all high self-ideas are certain about their capacities to fulfill their objectives, scholastic skill and association with guardians and companions. Youngsters with low confidence tend to be worried about voicing disliked or uncommon thoughts and abstain from drawing in consideration. The fate of understudies depends for the most part on their Self-Confidence (Asghari, F., Sadeghi, A. &Aslani, K. 2013). Self-confidence is the fundamental variable of identity. On the quality of Self-Confidence, the understudies can explain the challenges in individual, scholarly, social and instructive fields. Self- confidence makes them mindful of their self and enhances their scholarly and scholastic accomplishment. Individuals who are not Self-confident depend exorbitantly on the endorsement of others keeping in mind the end goal to like them. They tend to abstain from going for broke in light of the fact that they fear disappointment. They for the most part don't hope to be effective. They regularly put themselves down and tend to rebate or overlook compliments paid to them. By difference, fearless individuals will chance the dissatisfaction with others to in light of the fact that they for the most part trust their own particular capacities. They tend to acknowledge themselves; they don't need to affirm keeping in mind the end goal to be acknowledged (Dhall, S. &Thukral, P. 2009).Self-confidence as faith in one's own abilities (Good, 19873). Self-Confidence is a phenomenological construct. It is a characteristic (or) an aspect of Self -Concept. Simply it is an attribute of perceived self. In general terms Self-Confidence refers to an individual perceived ability to act effectively in a situation to overcome obstacles and get things go alright (Basavana). Self -Confidence is considered as one of the motivators and regulators of behaviour in individuals' everyday life. self Confidence is a positive attitude of one self towards one' s Self - Concept (Bandura).

To conclude Self-confidence is an attitude which allows us to have a positive and realistic perception of ourselves and our abilities. It is not a general characteristic which pervades all aspect of one's life. The people who are self-confident have a general sense of control in their lives and have their own abilities and believe that, within reason they can do what they wish, plan and expect.

Studies Supporting Self confidence

Basavanna (1975) Manual for Self-confidence Inventory. It is an inventory of 100 items (68 negative and 32 positive), to be answered either true or false.Positive items are scored as 1 for true and 0 for false, at the same time negativeitems are scored as 0 for true and 1 for false.Item validities for all the items are above 0.90 and the reliability of the scale is 0.91.

Agnihotry (1987) Manual for Agnihotri's self-confidence inventory. The Agnihotri's self-confidence inventory (ASCI) has been designed in Hindi to assess the level of self-confidence among adolescents and adults.The inventory contains 56 items which can be easily scored by hand. A score of 1 is awarded for a response indicative of lack of confidence for making cross (X) to wrong response to item number 2, 7, 23, 31, 40, 41, 43, 44, 45, 53, 54, 55 and for making cross (X) to right response to the rest of items. Hence the lower the score, the higher would be the level of self-confidence and vice-versa.The validity coefficient is .82 and reliability coefficient for teat-retest is 0.78 and index of reliability is 0.88.

Garant et. al (1995) Development and Validation of a Self-Confidence Scale. The purpose of this study was to construct and validate an 18-item self-confidence scale. A sample of 191 white undergraduate students from University du Québec à Trois-Rivières (44 men and 147 women) participated. The reliability of the test on Internal consistency (Cronbach α) was .84. Intercorrelations with other related measures (.23 to .69) were significant and in the expected direction.

Stolz (1999) studied the importance of self confidence in performance among students. The results showed that the students who received the negative encouragement and the poor grade on the questionnaire did more poorly than the students that received positive encouragement and good grades on the questionnaire. The results showed that there

was a significant effect of self-confidence and self-efficacy in performance.

Nurmi, et. al (2003) carried out research on pupil's self-confidence in mathematics –A gender comparison. The sample consisted of more than 300 fifth graders and seventh graders. Furthermore 40 pupils participated in a qualitative follow up study (interview and observations). Result indicated that the fifth graders have high self-confidence than seventh graders. Additionally, boys in both the grades had remarkably higher self-confidence in mathematics than girls.

Thirumoothi andIndumati (2005) conducted a study on self-confidence in relation to competitive anxiety among basketball players. The result revealed no significance difference between males and females with reference to self-confidence. There was no relationship found between self-confidence and competitive anxiety among males. Self-confidence was negatively correlated with competitive anxiety in females and also somatic anxiety in males. There was slight significant relationship between self-confidence and somatic anxiety among females.

Geeta and Laxmi (2006) conducted a study to know the impact of emotional maturity on stress and self-confidence of adolescents. The findings revealed that the adolescents with high emotional maturity have significantly high stress and self-confidence as compared to those with low emotional maturity. Adolescents with a greater number of siblings have shown significantly higher level of self-confidence than their counterparts. It was also found that educational level of father has significantly influence the stress of their adolescent children. Adolescent boys have significantly higher stress than girls and girls have significantly higher self-confidence.

Pandey(2007) Manual of Self-Confidence Inventory for school students (PSCI).The revised scale is developed by Pandey DD in Hindi to measure self-confidence of students of tenth grade. It consists of 60 items with two response categories 'Yes' or 'No'. This has 9 dimensions viz, 1. Social and Emotional maturation 2. Intellectual adequateness 3. Satisfaction 4. optimism ness 5. Independence 6. Self-assuredness 7. self-19 feeling ness 8. Evaluation about the self-9. Decisiveness. In

this inventory high score means, low self-confidence, low score means high self-confidence. This has test-retest reliability co-efficient equivalent to 0.88 and split half reliability equivalent to 0.89.

Aleem and Rastogi (2007) studied school environment, school adjustment and self-confidence of high school adolescent in the age group thirteen to fifteen years. Results of the study revealed that larger number of girls scored high category in certain stimulation, cognitive encouragement, acceptance and permissiveness while average is rejected. Boys scored in average category all the size dimensions. Majority of boys and girls scored in average category on school adjustment and self Confidence. Girls scored significantly higher on cognitive encouragement as compared to boys. School environment was negatively co-related with self-confidence.

Ampadu (2009) conducted a study on beliefs, attitudes and self-confidence in learning mathematics among basic school students in the central region of Ghana. Five hundred (500) grade nine students in the central region of Ghana were selected as a study. The results revealed that the students have positive attitude towards mathematics. However, majority of students were of the view that a more positive attitude could be formed if their mathematics teacher shows more positive attitude and high self-confidence in mathematics and encourage them to develop interest in this subject. The study also revealed that there was need for teachers, school authorities and Ghana Education Services (GES) to offer guidance and counseling services for students to help them in their selection of academic programme at senior school level and career aspirants.

Sar et. al (2010) Analyzing undergraduate students 'self confidence levels in terms of some variables. The sample, of the study was 168 students studying at Aksaray University. Data were collected via a scale measuring Self confidence levels of students. In data analyses, descriptive analyses, t-test and ANOVA were used. Results of the study showed that there was significant difference in terms of gender and departments.

Mishra and Singh (2012) conducted a comparative study of self-concept and self-confidence of sighted and visually impaired

children. A sample of 200 students consisted of 100 sighted and 100 visually impaired children were taken. The study revealed that visually impaired students were found to have low self-confidence and sighted students have high self-confidence and also there was a significant difference in self-concept of visually impaired and non- challenged students.

Asghari, et. al (2013) analyzed a comparative study of the financial independence, self-confidence and decision-making power, awareness of the social resources and mental health in the women. The present study has been carried out to assess the interaction effect of sex, locality and self-confidence on emotional intelligence on a sample of 100 prospective teachers both male and female belonging to urban and rural localities. It has been revealed that the main effects of sex and self-confidence were found to be significant whereas the main effects of locality as well as the various interactions were found to be non-significant.

Greenacre, et. al (2014) Conducted a study on 'Self Confidence and the Ability to Influence. The results demonstrate that greater levels of social self-confidence lead a person to act as a de-facto leader, with peers following their purchasing behaviour as a consequence of the influence they exert.

Manikandan (2015) Construction and Standardization of Self-confidence Scale in Malayalam. This is a 13-item scale. The data collected using this scale was analyzed using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). The Confirmatory Factor Analysis (CFA) fit statistics indicated high fit with normed chi-square value of (CMIN/DF) 1.742; CFI value of 0.952; GFI value of 0.951; RMR value of 0.046; IFI value of 0.953 and RMSEA value of 0.048.

Verma and Kumari (2016) Conducted a study on Effect of Self-Confidence on Academic Achievement of Children at Elementary Stage. Findings of the study revealed that significant relationship exists between self-confidence and academic achievement of elementary school students. No significant difference was found in the self-confidence of male and female elementary school students. It was also, found that there exists difference in the academic achievement of elementary school students with high and low self-confidence.

Verma (2017) Explored Self-confidence among university students: An empirical study. The findings of the study revealed that there was significant difference in self-confidence of university students in relation to their streams.

Stuhlmiller andTolchard(2018) conducted a study onGlobal Health Competency Self-Confidence Scale: Tool Development and Validation. In total, 126 graduate students from a university in New York State participated in the validation process of the Global Health Competency Self-Confidence (22-item). The scale has excellent internal consistency (Cronbach's alpha=0.92) and test-retest reliability (reliability (r)=0.455.

Kunhertanti and Santosha(2018) Examined the Influence of Students' Self Confidence on Mathematics Learning Achievement. The results of hypothesis testing show that there is no significant relationship between students 'self-confidence with students' achievement. However, the magnitude of the correlation shows 0.098956, meaning that students' self-confidence contributes 0.98% to the mathematics learning achievement.

Verma, et. al (2019) StudiedEffect of Psychological Interventions for Improving Self-Confidence of University Students. After, conducting the pre-test and post-test, the scoring indicating the self confidence level of the sample was matched. According to the results, t value is -3.33 and p value is 0.004 which reflects that there is a significant difference in pretest and the posttest conditions. The results indicate a certain amount of effectiveness in the post test condition.

Akbari and Sahibzada(2020) Examined Students' Self-Confidence and Its Impacts on Their Learning Process. The findings revealed only some of the students were low self-confident and most students were highly self-confident. In addition, students' self-confidence effected their learning in areas of students' participation, in seeking goal, developing interest in lessons, in decreasing students' anxiety, they are being comfortable with their instructors and classmates and also in sharing their opinions related to lessons in class.

From the above literature it is clear that in order to achieve success in every sphere of

life self-confidence is needed. A self-confident individual faces every challenge in life bodily. Confidence is a tool that helps the student to manage their problems, challenges, fears, and maintains a positive attitude. A confident student is a happy and fruitful and can face every problem that comes in his life.

Construction of General Self-confidence Scale

Self-confidence is believing in yourself, feeling comfortable in your true-self, knowing you have worth. If you are confident, people believe you, confidence is attractive, brings success, helps to connect well with others and you generally feel happier.

The Item Pool

The researcher has adopted Likert type of items in the present scale as these types of items aremostly used in psychological testing. For the purpose of item pool, initially a list of 26 statements relatedto self-confidence were prepared. Then, the draft items were given to a group of 5 selected experts in the field of psychology, education and scale construction, with a request to review the statements and evaluate their content accuracy and coverage, their repetition, editorial quality with suggestions for additions, deletions and modifications of items.Based on 80% unanimity of the experts, 20 statements were included in the 'try-out form' of the scale.

Draft Scale

General self-confidence scale was standardized on students studying in High schools and in Higher Secondary institutes of Jammu and Kashmir. The scale comprised 20 items with 5-point Likert type responses viz., Strongly Agree, Agree, Neutral Dis-agree, Strongly Disagree.For self-reliance (positive) statements,Strongly Agree '5' was given and whereas,Strongly Disagree '1' marks were given. For self-skepticism (negative) statements same pattern of responses in reverse order, '1' and '5'were added to get the total score respectively.This scale was administered to a representative sample of 300 male and female students.

Item analysis

For item analysis, scores of all the 260 students were arranged in ascending order. From this arrangement 27 percent of the subjects from upper and 27 percent subjects from lower group were selected for item analysis. Each group contains 70 students. Discriminative Power was calculated for each item. The value of the Discriminative power is a measure of extent to which a given statement differentiates between low and high groups on that variable.

After scoring the items of each testee, the scores were arranged in descending order (highest scoring to the lowest). Two separate groups, one of 27% from the highest scoring and other of 27% from the lowest scoring were made. Inter correlation matrix was examined in order to overcome existence of multicollinearity and singularity in the scale. After analysis, 4 items having the multicollinearity and singularity were rejected and the final draft of the scale comprised of 16 items. Table 1 showing dimensions and number of items in respective dimensions.

Table: 1 Showing dimensions and number of items in respective dimensions

S.No.	Dimensions	Item No.	Total
1	Self-reliance (Positive)	GSC7, GSC9, GSC11, GSC12, GSC13, GSC14, GSC15, GSC16	8
2	Self-skepticism (Negative)	GSC1, GSC2, GSC3, GSC4, GSC5, GSC6, GSC8, GSC10	8

Standardization of General Self-Confidence Scale

The final manuscript with 16 items was administered to a representative sample of 810 secondary school students. The total score of the scale varied from 16 to 80 and can be inferred as higher the score higher the self-confidence and vice-versa.The mean age of the students participated in the development of scale was 14 years with 13.9 years as minimum and 18 years as maximum.

Reliability

The consideration of reliability of a scale viewed as essential elements for determining the quality of any standardized test. Cronbach's

alpha was used for determining the internal consistency reliability of the scale.

Table 2: Reliability Statistics

Descriptive statistics of Items, Scale and Cronbach's Alpha

S. No.	Descriptive statistics for item					Descriptive statistics for scale		
	Range	Mean	Variance	S. D	N	Scale Means if item Deleted	*Corrected Item-Correlation	Cronbach's Alpha if Item Deleted
1	4	2.95	1.55	1.24	810	41.23	.313	.866
2	4	2.73	1.43	1.19	810	41.45	.581	.854
3	4	2.65	1.70	1.30	810	41.53	.528	.856
4	4	2.63	1.37	1.17	810	41.55	.538	.856
5	4	2.91	1.38	1.17	810	41.27	.526	.857
6	4	2.68	1.28	1.13	810	41.51	.468	.859
7	4	2.84	1.67	1.29	810	41.35	.566	.854
8	4	2.81	1.15	1.07	810	41.37	.455	.860
9	4	2.86	1.30	1.14	810	41.32	.444	.860
10	4	2.71	1.54	1.24	810	41.47	.607	.853
11	4	2.77	1.39	1.18	810	41.42	.514	.857
12	4	2.60	1.31	1.14	810	41.59	.420	.861
13	4	2.74	1.63	1.28	810	41.45	.492	.858
14	4	2.55	1.39	1.18	810	41.63	.467	.859
15	4	2.76	1.76	1.32	810	41.43	.555	.855
16	4	2.94	1.84	1.35	810	41.25	.474	.859

* r=0.29 (p<0.001) two tail

Table 3: Descriptive statistics of General Self-confidence Scale

Mean	Variance	N	S. D	No. of Items
44.19	126.25	810	11.23	16

Validity

The concept of validity was formulated by Kelly (1927, p. 14) who stated that a test is valid if it measures what it claims to measure.

Content (Face and logical) Validity

The content (Face and logical) validity of the scale was verified by number of experts and academicians. There are various methods to establish content validity of the tool. Data screening was carried out in order to overcome existence of multicollinearity and singularity in the scale. For testing multicollinearity and singularity 'Determinant' of the R-matrix was estimated and it was greater than in both cases 0.00001. Sampling adequacy was also carried out and found to be greater than 0.50 as required.

Intrinsic Validity

The formula used to determine the intrinsic validity is the square root to its reliability.

Thus, the intrinsic validity of this test is

$$V=\sqrt{R} \quad V=\sqrt{0.866} \quad V=0.930$$

Criterion (Concurrent) Validity

The criterion (concurrent) validity of General self-confidence scale was examined by using Pearson Product Moment Correlation (zero order) with the self-confidence scale designed by (Joe Cardot with N= 100) and was found to be 0.770 (p<0.001) two tailed. It confirms that the construct validity of the self-confidence test is excellent.

Norms

The standard score (more commonly referred to as Z-Score) is very useful statistics, as it enables us to compare scores that are from

normal distribution. Standard Scores (Z- score) were calculated by using the descriptive statistics (**Mean = 44.19, SD=11.23, N=810**).

Z= (X— μ) ÷σ

Where X is the raw score of mathematical anxiety scale, μ is the mean and σ is the standard deviation. On the basis of descriptive statistics, the Z - score norms have been prepared which are valid for secondary school students shown in Table 4.

Table4: Z-Score Norms for the General self-confidence Scale
Mean = 44.19   S. D = 11.23   N = 810

Raw Score	Z-score	Raw Score	Z-score	Raw Score	Z-score
16	-2.51	35	-0.81	54	0.87
17	-2.42	36	-0.72	55	0.96
18	-2.33	37	-0.64	56	1.05
19	-2.24	38	-0.55	57	1.14
20	-2.15	39	-0.46	58	1.22
21	-2.06	40	-0.37	59	1.31
22	-1.97	41	-0.28	60	1.40
23	-1.88	42	-0.19	61	1.49
24	-1.79	43	-0.10	62	1.58
25	-1.70	44	-0.01	63	1.67
26	-1.61	45	0.07	64	1.76
27	-1.53	46	0.16	65	1.85
28	-1.44	47	0.25	66	1.94
29	-1.35	48	0.33	67	2.03
30	-1.26	49	0.42	68	2.12
31	-1.17	50	0.51	69	2.20
32	-1.08	51	0.60	70	2.29
33	-0.99	52	0.69	71	2.38
34	-0.90	53	0.78	72	2.47

Table5: Classification of Norms for Interpretation
of the General Self-confidence Scale on the basis of Z-score

S. No.	Range	Category	Self-confidence Level
1	+1.50 & Above	A	Extremely High
3	+0.51 to + to +1.49	B	High (Positive)
4	-0.50 to +0.50	C	Average/Moderate (Neutral)
5	-1.49 to -0.51	D	Low (Negative)
7	-1.50 & Below	E	Extremely Low

Summary

The General Self-confidence Scale or test has excellent internal consistency, split-half reliability (Guttman) and followed by the use of Spearman-Brown prophecy formula. The face, content, intrinsic and criterion validities were also high and are in acceptable range. Thus, it can be concluded that the scale is highly reliable and valid for measurement of Self-confidence of 13-18 years of age group.

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PSYCHOLOGICAL PERSONA OF FAMILIES, EMOTIONAL EXHAUSTION, CARING FOR RELATIVES LEADING TO MENTAL ILLNESSES FOR MARRIED WORKING WOMEN

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ABSTRACT

Psychologists have been studying stress and stressors and its impact on psychological states and health for several decades. Initially researchers focused on stressful events themselves, called stressors. In today's society, since more and more women are working outside their houses, it has led them to perform multiple role job related stress, anxiety, role conflict, overload etc. The effects of these is seen on health when her resources will probably be sufficient to deal with the event, she feels moderate amount of stress. But when her resources are not sufficient to cope up with stress or stressful events, then she experiences a great deal of stress. The main objective of this paper is to find out the level of mental stress the married working women in facing while impressing family folks, caring for the relatives around and keeping her professional front also in mind. Also made an attempt to find out the strategies which could help her in relieving a little pressure.

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Keywords: *Married working women, stressors, Caring, Psychological persona and mental illness/stress*

Introduction

Women in India have come a long way after independence. From just a skilled homemaker, women today have acquired skills and capabilities of not just being a homemaker but being at par with their male counterparts. This is the new generation of women, who wants to pursue their dream career. But this life is not a bed of roses for all. More problems arise with the working mother as she has to fulfil the duties at work as well as home. In today's scenario, it is required for the husband and wife both to work towards fulfilling the financial needs of the family. Hence a common conflict among married working women is that though they work for balancing the family financially, unlike their counterparts they have to play the role of a homemaker also. As societies become more advanced technologically, women depend increasingly on their individual talent and inventiveness for their progress and development. The dual roles of the working women can lead to additional stress in their lives Stress is the psychological and physiological reaction that takes place when one perceives an imbalance in the level of demand placed on the capacity to meet that demand on individuals. Women all over the world specifically working women have a whole set of problems involving both family and professional lives. Women have to play their role as a wife, a mother and an earner. They have to manage their career while maintaining traditional roles. That means for

working women it is two sets of overlapping responsibilities. Therefore, in addition to their traditional roles, professional roles seem to be one of the major sources of stress that working women have to face.

Definition of Stress

Stress is the reactions of people which have excessive pressures or other types of demand placed on them. Work stress is explained as the adverse physical and mental reactions that appear when the job demands do not match and balancing between social and personal requirements. Moreover, the conflict of women will be all the more intense if her employer, as well as her family members held unreasonable expectations from her. Women's involvement in multiple role had a deleterious effect on their mental as well as their physical health. Due to this a woman is constantly under stress either at home or at workplace.

We live in stressful times. We are holding down two or more jobs. We are putting up with heavy job loads and unreasonable demands. We are swallowing outrage and frustration with unfair situations and irrational superiors because we cannot afford to be laid off or fired. Or we have already been laid off and we are struggling to find another job. Or we have given up and are coping with unemployment. Outside strains like these are called stressors. Stressors are the barely-tolerable pressures that bring us unhappiness and, eventually, disease. Some people hardly seem to be affected by

stressors. They maintain a sense of perspective and a sense of humour. They remain calm in the midst of adversity and catastrophe. Other people are overwhelmed by a lesser number and intensity of stressors and slide downhill, losing relationships, jobs, and eventually their mental and physical health. The physiological and psychological responses to situations or events that disturb the equilibrium of an organism constitute stress. While there is little consensus among psychologists about the exact definition of stress, it is agreed that stress results when demands placed on an organism cause unusual physical, psychological, or emotional responses. In humans, stress originates from a multitude of sources and causes a wide variety of responses, both positive and negative. All the way around working on a single leg in office, pushing herself to achieve heights and when she resumes home no body is there to look her after. Despite expecting from her to fulfil their requirements, doing kids school work, preparing the next day schedule and all other stuff. The women gets huffed and puffed in this routine.

Objectives

1. What is Stress and who are stressors?
2. Remedies to remove the mental illness/stress.

Literature Review

Zenani. P. (2019), made an attempt to find in his study about the Stress and how it is the psychological and physiological response that takes position when one perceives an imbalance in the degree of demand placed on the capacity to fulfil that demand on contributors. The following goals of the gain knowledge of are (1) To learn the style and level of stress confronted by means of working women within the learn discipline (2) To identify the sources of stress of working women (3) To identify the have an impact on of stress of working women (4) To establish the physical reaction faced by means of the working women because of excessive degree of stress. At last his research concluded that the know-how science supported and rapid developing work atmosphere, stress is an inevitable one. Working women populace has

additionally in the development stage. Working women face stress in managing their individual life with work existence.

Shukla Jaiswal et al (2017), suggested through their research study that Women's in modern global world have to play a dual role as housewife and career builder. The present investigation was conducted to examine the stress among the working and non-working women's. It was hypothesized that the working women's has more stress than the non-working women's. This study has found out that working women's have significantly higher level of stress than non-working women.

Masunga. I et al (2016), revealed in their study about the stress faced by mental phenomena of the care takers. Mental illness may cause a variety of psychosocial problems such as decreased quality of life of the patient's family members as well as increased social distance for the patient and the family caring for the patient. Psychosocial challenges are enhanced by the stigma attached to mental illness, which is a problem affecting not only the patient but also the family as a whole. Financial constraints, lack of social support, disruption of family functioning, stigma, discrimination, and patients' disruptive behaviour emerged as the main themes in this study.

Swathi and Reddy (2016), suggested in their research study that women are playing a vital role in the economic and social development of the nations all over the world. Working women have a whole set of problems involving both family and professional lives. Women have to play their role as a wife, a mother and an earner. They have to manage their career while maintaining traditional roles. That means for working women it is two sets of overlapping responsibilities. Therefore, in addition to their traditional roles, professional roles seem to be one of the major sources of stress that working women have to face. They had made an attempt via this review of literature gives information about working women stress, factors in the working environment that cause stressful situations among working women.

Qureshi and Sajjad (2015), concluded through their research study about the the impact of emotional exhaustion amongst employees working in the Kingdom of Saudi Arabia. Furthermore, the study also aims to access the

relationship between emotional exhaustion & job performance and emotional exhaustion & job satisfaction. The current research points out, that the relationship of job performance and job satisfaction with emotional exhaustion is strong in the Kingdom of Saudi Arabia. The research paper is based on quantitative analysis and it explores how lesser emotional exhaustion can improve the performance and job satisfaction of an employee working in the Kingdom of Saudi Arabia. This study also provided concrete insights about employees' views on emotional exhaustion, job performance and job satisfaction.

Balaji. R (2014), revealed in his study that Family–work conflict and work–family conflict are more likely to exert negative influences in the family domain, resulting in lower life satisfaction and greater internal conflict within the family. Variables such as the size of family, the age of children, the work hours and the level of social support impact the experience of Work family conflict and Family work conflict. It is also significant to note the success level gained by women in career and family in spite of all the stress they undergo at work place. It is also important to consider the consequences these variables have on psychological distress and wellbeing of the working women. It is clear from the current study that married women employees indeed experience WFC while attempting to balance their work and family lives. Thus, organizations need to formulate guidelines for the management of WFCs since they are related to job satisfaction and performance of the employees.

Tripathi and Bhattacharya (2012), in their research study said besides, changing roles of working women, they have maintained the traditional work ethos of household. This research is devoted towards finding the root causes of the existing problems faced by the working women. It also aims at finding feasible solutions that have been practiced elsewhere and needs to be adopted at other social fronts. Reveal that our null hypothesis of Working Women feel more stress than working men stands true due to the highlighted facts from different sources.

Gyllensten and Palmer (2005), evaluated in their research the role of gender in the workplace stress. Also they aimed at various stressors for women. The results which their research indicated was that women reported higher degree of stress as compared to men due to multiple roles, lack of career progress, pressure from family elders for house hold chores, discrimination at work, stereotyping etc.

Remedial Solutions

1. Proper planning and efficient time management will lead to reduction in stress.
2. Mental preparation to stress in a positive way.
3. Procrastination steals your happiness. Never postpone a task which you can achieve today.
4. Do the activities like yoga, picnic, playing scrabbles, solving cross word puzzle, in newspaper, internet games, doing exercises, reading books listening to music, shopping, meditation, making new dishes, talking to the loved ones, Watching entertainment programmes.
5. Avoiding negative people
6. Enjoy your week end with your family.
7. Life is a gift of god, lead it with smile.
8. Be calm and patient.
9. The employer should motivate the employees. A pat on the back of the employee and recognition for his good work goes a long way in reducing stress.
10. Build up a competencies and capabilities which will strengthen you to survive in the stiff competition.
11. A cup of tea or coffee is good stress busters.
12. Prioritize your activities and give more importance to an activity which involves an urgency.
13. Be positive and optimistic.
14. Allocation of financial resources judiciously towards expenses like health entertainment and savings.
15. Eating healthy diet.
16. Getting addicted to alcohol and smoking is not a solution to overcome stress avoid it.
17. If your boss is continuously torturing you take the matter to the higher management.
18. Share your thoughts and feelings with your loved ones.
19. Manage time and conserve energy. Make time for hobbies, recreational and social

activities which will help divert attention away from problems.
20. Positive mood of the team leader promotes worker productivity and retention.
21. Simplify your life and encourage a healthy lifestyle. Take a regular sleep, have plenty of water, have healthy eating habits.
22. Speak out clearly.
23. Breaks of relaxation.
24. Plan a stringent time table.
25. Moreover find some time for reaping the positive energy from blogs that many people post on social media from their day to day life experience.
26. Turn ourselves to some spirituality.

Research Limitation

Stress is one of the notion which is not new and every folk in his or her life is facing at every footfall. Although an attempt is made to highlight the level of stress a married working women faces everyday still this research is lacking in experiences of respondents which could be gathered through in depth interview and other sources of fetching information. This review paper is entirely based on only literature review and research papers of eminent researchers.

Conclusion

To conclude we would say stress kills creativity. Safeguarding the mental health of employees is the basis for a peaceful nation. A woman's peace paves peacefulness in the family, then the whole community, and ultimately the whole nation. Do not remain pre-occupied with yourself. Turn your focus outwards. Help others. This will release some stress. Manage stress by learning how to take charge of your thoughts, emotions, environment, and the way you deal with problems. At the same time and the stress and work pressure is far more than others as a lot of time management, job management, kid management, house management everything is put under criteria. It is critical for work and family research to fully understand the conditions under which the married women employees experience conflict between their roles. There is a need to consider working environment, job satisfaction, family support and number of working hours in the future research. Longitudinal studies need to be conducted to examine how the stages of life (e.g., marriage, child birth, and child rearing) affect work and family concerns. It is clear from the current study that married women employees indeed experience more of the mental pressure and illness while attempting to balance their work and family lives.

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STUDY OF TSP, ACO, MULTI DEPOT VEHICLE ROUTING PROBLEM AND ROUTESOPTIMIZATION TECHNIQUES

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ABSTRACT

As everyone knows, there is an exceptional quantity of optimization issues on the planet. One of the quite difficult and high-level problems is the vehicle routing problem (VRP). Within the history of VRP, the easiest and most noted routing crisis is the traveling salesman problem (TSP): given a collection of city areas, a salesman must go to each city once and return to the initial commencing metropolis, to find out the shortest visiting routes. This quandary can also be solved most effectively by way of utilizing ant colony optimization procedure. This paper discusses about vehicle routing problem, its variants, travelling salesman problem, ant colony optimization and various research works done in previous years in this area.

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Keywords: Multi depot vehicle routing problem (MDVRP), travelling salesman problem (TSP), ant colony optimization (ACO), routing.

Introduction

Due to visitor's administration, site visitor's volume, site visitor's accident and rush hour, visiting pace of the vehicle vary depending on time. In exclusive occasions, price of vehicle crossing the identical stretch of avenue community is correspondingly alternate, which ultimately differ the whole transportation cost. But in lots of other cases, transportation price between any two elements is quite often viewed as depending on the distance. The road community is viewed as a static mannequin. The drawback of solving logistics distribution problems with static street community mannequin is that autos are also slowed down or jammed in actual occasions, which leads to the giant deviation between computing outcome and the actual outcome. In actual lifestyles, it expenditures another way when driving under one-of-a-kind avenue stipulations, even as delivery time generally influences the client pleasure measure for distribution offerings. So automobile routing concern with soft time home windows and road situation component is of functional significance [7].

The travelling routing problem (VRP) has been greatly studied by way of operations researchers since 1959. Within the classical deterministic VRP, a number of automobiles are located at a single depot and have got to serve a quantity of geographically dispersed buyers. Every vehicle has a given potential and every purchaser has a given demand. The target is to reduce the complete travelling rate for servicing the shoppers. Every auto begins at the depot and collects (supplies) items from (to) a subset of the patrons, thoroughly enjoyable the demand of every purchaser it visits, and then returns to the depot. The route that every car is assigned have to satisfy a quantity of constraints, such as cars potential, time windows, driver's maximum working time and many others. The VRP is a complex combinatorial optimization drawback [1].

Vehicle Routing Problem

In VRP a number of cities ought to be visited by using an automobile which have got to return to the identical metropolis the place it started. In fixing the obstacle one tries to construct the route so that the total distance traveled is minimized. Each automobile begins from the identical city, referred to as depot and must return on the finish of its experience to this city once more. If n is the quantity of cities to be visited then (n-1)! Is the complete number of possible routes. As the quantity of input information raises the drawback raises in complexity, therefore the computational time needed renders this method impractical for all but a smaller number of cities. Instead than on account that all possible tours, heuristic algorithms for solving the VRP are able of significantly lowering the quantity of tours to be taken into consideration [2].

A generalization of the well-known car routing situation is a couple of auto routing challenge, which includes making a choice on a collection of routes for m cars. The m-VRP can mostly be outlined as follows: Given a set of nodes, let

there be m car placed at a single depot node. The remaining nodes (cities) which might be to be visited are called intermediate nodes. Then, the m-VRP contains discovering excursions for all m automobiles, which all start and finish on the depot, such that each and every intermediate node is visited precisely as soon as and the whole rate of travelling all nodes is minimized [2].

VRP is further extended in following types of problems [6]:

1. *MDVRP*
2. *A.1. MDVRPTW*
3. *A.2. MOGAVRP*
4. *A.3. MCDVRP*

VRP: The Vehicle Routing Problem (VRP) is a general identify given to a collection of issues wherein set of routes for a fleet of automobiles centered at one or a number of depots are to be fashioned for servicing the customers dispersed geographically. In the VRP, more than one auto depart from a single place (a "depot") and have got to return to that area after completing their assigned tours. The target of the VRP is to form a route with lowest cost to serve all customers. Mostly, distribution or collection of goods from shoppers to depot is known as VRP or automobile Scheduling situation. In unique, the solution of a VRP calls for the selection of a collection of routes, each performed by means of a single car that begins and ends at its own depot, such that the entire requirements of the purchasers are fulfilled, with some operational constraints and the global transportation fee is minimized. The operational constraints could be a car capacity, route size, precedence relation between buyers, and so on.

MDVRP: The Multi-Depot Vehicle Routing Problem (MDVRP) is a generalization of the Single-Depot Vehicle Routing Problem (SDVRP). In the Multi Depot Vehicle Routing Problem (MDVRP), multiple automobiles go away from a more than one depot and have to return to that depot, from the place they leave, after finishing their assigned tours. The target of the MDVRP is to kind a route with lowest fee to serve all purchasers from a couple of depots. Often, the objective of the MDVRP is to scale back the whole delivery distance or time spent in serving all shoppers. Lesser the

supply time, larger the purchaser pleasure. Fewer autos imply that the complete operation price is much less, consequently the objective may also be minimizing the number of vehicles. Although there is also a number of ambitions, the goal of MDVRP is to develop the effectivity of supply. MDVRP proposed heuristic system includes of two phases: route development and automobile dispatch. Routes are developed through applying the nearest Neighbor procedure (NNP) to cluster shoppers and opt for an appropriate depot, Sweeping and Reordering systems (SRP) to generate initial feasible routes, and Insertion system (IP) to enhance routing. All of the beforehand recounted extensions deal handiest with one single depot, consequently the field of VRP used to be enriched through the MDVRP classification, which makes a specialty of effective routing algorithms that may handle multiple depot setups.

MDVRPTW: Other variants of the VRP are the VRP with split deliveries (SVRP), the place client orders will also be applied utilizing more than one car. This makes a specialty of a couple of depot case with the addition of time windows (MDVRPTW), so that shoppers have to be serviced out of a few depots, underneath the identical constraints that practice for the VRPTW. Consequently the auto routes must be determined in a technique that:

a) Each route starts and ends at the same depot.
b) All customer requirements are met exactly once by a vehicle.
c) The time windows for both customers and the depots are respected.
d) The sum of all requirements satisfied by any vehicle does not exceed its Capacity.
e) The total cost is minimized.

MOGA-VRP: The Multi Objective Genetic Algorithm Vehicle Routing Problem offers rise to a set of finest solutions (mostly referred to as Pareto-most useful solutions), as an alternative of a single most excellent resolution. Within the absence of any extra expertise, this sort of Pareto-top-quality solutions cannot be mentioned to be higher than the other. This needs a person to search out as many Pareto-most excellent options as possible. Classical optimization approaches (including the multicriteria resolution-making ways) endorse converting the multi-objective optimization

obstacle to a single-purpose optimization main issue by means of emphasizing one exact Pareto-most reliable solution at a time. When one of these approaches is to be used for finding multiple solutions, it has to be utilized many times, hopefully discovering a further resolution at each simulation run. The nondominated sorting genetic algorithm (NSGA) was one of the most first such EAs. An improved version of NSGA, which we name NSGA-II, is first-class for finding the easier solution in MOGA-VRP.

Multi Capacitated Depot VRP: In Multi Capacitated Depot VRP (MCD-VRP), potential of all automobiles is viewed same. Every Depot on this hindrance has a specified ability. In this, at a given time a consumer can just only provide a product or pick up a product. The cost perform in this difficulty is watching for minimizing four forms of expenses: journeying charges, the constant bills of utilizing depots, the fixed rate of utilizing vehicles and ultimately the penalty price of passing the time window. The most important intention is minimizing the journeying charges.

MDVRP with pickup and delivery: It don't forget a multi depot automobile routing concern with pickup and delivery requests. In the crisis of curiosity, every area will have goods for both pickup and delivery with multiple delivery areas that might not be the depots. These characteristics are fairly fashioned in industrial apply. A partial swarm optimization algorithm with more than one social finding out structures are proposed for solving the functional case of multi depot automobile routing quandary with simultaneous pickup and delivery. A new decoding system is carried out making use of the PSO category offered within the ETLib object library. Computational experiments are carried out making use of the scan occasions for the pickup and supply hindrance with a newly generated example. The preliminary outcome show that the proposed algorithm is able to furnish just right way to many of the test problems [6].

Travelling Salesman Problem

Recently, visitor's congestion has come to be one of the most serious problems in developing nations as a result of the speedy development of economic system and population. Accordingly, the travelling salesman problem (TSP) which is famous quandary on discovering the shortest course has attracted quite a few curiosities in gain knowledge of optimization. A method for solving the TSP is the ant colony optimization algorithm (ACO). There are variants of ACO corresponding to Ant system (AS) [1], Ant Colony procedure (ACS) [2] which show the pleasant efficiency on the shortest path challenge. The ACS has three most important strategies together with tour building, global pheromone path update and nearby pheromone trail replace [2]. Finding the fine set of parameters for ACS is an interest approach. The efficiency of metaheuristics depends upon the settings of their parameters that's regularly well known. Discovering the suitable parameters for an algorithm is a nontrivial mission in observe. As a consequence, the variation techniques on parameters setting might be divided into offline and on-line systems. Offline method finds suitable parameter values earlier than their deployment, at the same time on-line process modifies them in solving challenge circumstances [5].

Ant Colony Optimization

Ant colony algorithm derived from the human's notion of the ants' swarm intelligence in nature. By means of the pheromone left by using its possess in direction, ants keep in touch and coordinate, and kind the positive suggestions of optimization, so that the ants in multiple paths steadily gathered to the shortest direction and acquire the target of optimization. This algorithm's applications in TSP main issue, quadratic undertaking predicament, Job-keep Scheduling situation, VRP situation have large concentration in academia and have made exceptional achievements. Successively regarded MMAS, Ant-Q procedure, ant colony algorithm with a Tabusearch process, multi-ant colony algorithm, the ant colony algorithm with mutation features, self-adaptive ant colony algorithm, and so on. Showing ant colony algorithm's advanced characteristics that is relevant in solving combinatorial optimization problems: discovering the optimization by way of positive feedback and dispensed collaboration [3].

The usual characteristic of optimizing logistics distribution routing quandary and TSP predicament is: finding the shortest course by means of the entire patron, but the obstacle of optimizing logistics distribution routing has more tricky constraints and optimization ambitions. Ln view of this feature, the paper researched an optimization algorithm situated on multi-ant colony, that, a complete of ant colony was once divided into a few sub ant colony and gave them distinct control parameters, each ant colony determined the top-quality resolution Independently and separately and used the max-min ant colony algorithm within the system of optimization. To beef up the worldwide optimization capability of algorithm, the replace mechanism of pheromone was once extended. Each and every sub-colony run independently, after some generations, by way of transferring the elite ants' pheromones, performed multi-ant colony's co-evolution, and bought the most excellent resolution, made it having a good functional result in the optimizing logistics distribution routing obstacle [3].

Related Work

In this section, several methods are briefly discussed.

Fan et al. proposed a heuristic algorithm for a couple of vehicles routing challenge with stochastic demand and the goal is to cut down the complete visiting price. Two-phase method is adopted to handle this difficulty. Within the first segment, an algorithm is proposed to partition shoppers into clusters, and the main project of the 2nd phase is to design a robust routing by way of each cluster of shoppers to scale down the total expected visiting price. Both the a priori technique and the preoptimizations process are used to acquire the optimal routing. The test results point out that this system can produce options of excellent and is an effective algorithm for the multiple automobiles routing drawback with stochastic demand [1].

Nallusamy et al. handled generating of an optimized route for a couple of vehicle routing issues (m-VRP). They used a strategy of clustering the given cities relying upon the number of vehicles and every cluster is dispensed to a car. Ok- method clustering algorithm has been used for handy clustering of the cities. On this means the m-VRP has been converted into VRP which is simple in computation in comparison with m-VRP. After clustering, an optimized route is generated for each and every auto in its distributed cluster. As soon as the clustering had been completed and after the cities were allotted to the various autos, each and every cluster/tour was taken as an person auto Routing obstacle and the steps of Genetic Algorithm were utilized to the cluster and iterated to acquire essentially the most best price of the space after convergence takes position. After the application of the more than a few heuristic strategies, it was found that the Genetic algorithm gave a greater influence and an extra most efficient tour for m-VRPs briefly computational time than different Algorithms because of the broad search and positive nature of the algorithm [2].

Li et al. awarded a mathematical logistic distribution mannequin with constraints was constructed, a multi-ant colony virtual parallel optimization algorithm to resolve the route optimization challenge of logistic distribution. To increase the self-adaptability of the ant colony algorithm and increase the converging price and international search ability, pheromone updating strategy used to be multiplied. Experimental outcome exhibit that the top-rated or nearly most desirable options to the logistic distribution routing can be swiftly acquired by way of the extended multi-ant colony virtual parallel optimization algorithm [3].

Jiao-ping et al. proposed the mathematical model of multi-manufacturer allied open vehicle routing concern (MEAOVRP) after which the coding and genetic operator situated on a two dimensional constitution are put forward. At final, the genetic algorithm is demonstrated to comfortably optimize the MEAOVRP with an instance [4].

Sangeeta et al. provided a multiple objective genetic algorithm for multi depot auto routing drawback with simultaneously pickup and delivery (MDVRP-MOGA). MDVRP-MOGA is a spread of VRP issues.MDVRP is a NP-difficult trouble which is extra effective than VRP. MD-VRP simultaneously determines the routes for a number of autos from a couple of depots to a set of patrons and then return to the

same depot. The target of this concern is to seek out the routes for automobiles to carrier all the buyers at a minimal fee which is in terms of quantity of routes and whole travel distance without violating the ability of the cars. A Multi objective Genetic Algorithm is offered to resolve the proposed trouble with new constraints [6].

Yu et al. presented a procedure for solving multi-depot auto routing challenge (MDVRP). First, a virtual valuable depot is delivered to switch MDVRP to the multi-depot vehicle routing challenge with the digital critical depot (V-MDVRP), which has similarities to a vehicle routing situation (VRP) with the virtual relevant depot as the beginning. An increased ant colony optimization with coarse-grain parallel process, ant-weight approach and mutation operation, is provided for the V-MDVRP. The computational outcome for 23 benchmark issues are said and compared to these of alternative ant colony optimizations [8].

Lee et al. regarded a multiple-auto routing hindrance with break up select-ups (m-VRPSP). This difficulty entails more than one supplier, a single depot, and a fleet of equal capacity vehicles liable for providing supplies from the suppliers to the depot. Any provider could also be visited by multiple truck, as a result permitting cut up opt for-ups. The crisis is to examine, for each truck, which suppliers to consult with and the size of hundreds to decide on up so to lessen the total transportation price for the fleet, which depends on the quantity of vehicles used and their routes. We enhance an essentially new mannequin for the m-VRPSP, a deterministic dynamic software (DP). Although the most natural DP formula outcome in a DP with uncountably-countless state and action spaces, an optimality-invariance we set up results in an similar DP with finite state and action spaces. This DP components results in a new detailed algorithm for fixing the m-VRPSP, headquartered on a shortest direction search algorithm, which is conceptually easy and convenient to enforce [9].

Cattaruzza et al. awarded a survey on the multi-shuttle auto routing difficulty (MTVRP) and on associated routing problems where autos are allowed to participate in a couple of journeys.

The first part of the paper makes a speciality of the MTVRP. It offers a unified view on mathematical formulations and surveys designated and heuristic techniques. The paper continues with editions of the MTVRP and other households of routing problems where multiple journeys are repeatedly allowed. For the latter, it especially insists on the motivations for having a couple of trips and the algorithmic penalties. The anticipated contribution of the survey is to provide a complete overview on a structural property of routing issues that has seen a strongly developing interest within the last few years and that has been investigated in very special areas of the routing literature [10].

Singh et al. studied all ant founded optimized routing algorithms to remedy routing issues. Routing algorithms are probably tricky to be formalized into mathematics, they're as an alternative established making use of wide simulation. Early work on unstable network environments experienced in mobile advert hoc networks (MANETs) is dependent specially on making use of the average techniques of routing in wired networks, comparable to distance vector or hyperlink state algorithms. Even as many optimizations to these algorithms exist, each of them is exceptionally worried with finding the minimal hop route from supply to vacation spot. A giant quantity of labor has also been done within the discipline of power efficient routing. This procedure attempts to maximize network lifetime by means of routing via paths, which use the least amount of vigor relative to each and every node [11].

Qi et al. utilized a two-section algorithm to handle CVRP. It takes the benefits of Simulated Annealing (SA) and ant colony optimization for fixing the capacitated car routing trouble. In the first section of proposed algorithm, simulated annealing supplies a just right preliminary solution for ant colony optimization. Within the 2nd section, Iterative regional Search (ILS) approach is employed to seeking the shut-to-optimum answer in regional scope founded on the potential of the auto. Experimental results show that the proposed algorithm is superior to original ant colony optimization and simulated annealing

separately stated on partial benchmark issues

Conclusion and future scope

In most experiences of VRP, researchers nearly define some normal information related to purchasers' areas and needs, on hand cars, and so forth, which might be fully recognized before conducting carrier. Nonetheless, in exact carrier techniques, VRP is dynamic; that is to claim, consumers' demands and preparations are altering regularly over time, despite the fact that part of buyers' needs is also recognized in advance before beginning provider. Hence, there is need for more effective algorithm to solve the vehicle routing problem.

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THE IMPACT OF SKILL DEVELOPMENT INITIATIVES IN THE EMPLOYMENT OF TRANS-GENDERS

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ABSTRACT

Aim and background: In this transformation era when a lot of things have changed as now women are empowered, trans-genders are being recognized as third gender. It was the need of the hour to start various skill development initiatives among trans-genders for their employment.The aim of this study is to find out the impact of skill development initiatives in the employment of trans-genders.

Materials and methods: Qualitative methods and tools were used for this study in order to seek the possible answers to the research question. The study was carried out in Delhi city of India on a sample size of 100 respondents. The respondents chosen were of the third gender i.e. the trans-genders. In the present study the four skill development schemes which are being undertaken for the employment of trans-genders are Sweekruti, GarimaGreh, NitiAayog and Umbrella Scheme.

Results: It can be found that most of the trans-genders are employed in embroidery as the embroidery training had the maximum positive effect on trans-genders. As 52% respondents agreed to the embroidery training, 27% remained neutral and 21% disagreed with it. After embroidery the respondents were employed in craft making as 44% of them agreed with its training, 47% remained neutral and 9% disagreed with it. The respondents who agreed with the training of beauty parlour and computer were 21% and 18% respectively.

Conclusion: The changing nature of society has brought many changes, but the transgender community remains faced with a number of employment challenges. In the workplace, there is a need for transgender-inclusive measures, including equal opportunity hiring, construction of third gender restrooms, combating harassment and misconduct, and providing insurance and benefits. In addition, we must treat them equally in our society to ensure that they are more inclusive.

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Keywords: Skill development, Employment, Trans-genders.

Introduction

Humankind has been inhabited by transgender people of every race, class, and society since recorded history began. Originally, the term 'transgender' was used by people who felt different from their gender in the mid-1990s (Valentine, D. (2007)). Many transgender advocates feel that there's still much to be done in the fight for equality, even though there has been a positive movement for LGBTQAI+ community in recent years. With the quality of life and social development among its people, Delhi is the most advanced state in India. However, the transgender people in Delhi is marginalized and have been facing social discrimination in every grounds like, education, health, employment opportunities, etc. Being unacceptable in the family and society, many of them have migrated to other states in search of social acceptance and livelihood opportunities. The trans-genders face physical abuse due to the social stigma. Since they are thrown out from the family, many of those who face gender dysphoria end up in begging and prostitution (Ahmad, M. (2018)). In order to uplift the trans-genders the government along with various NGOs has undertaken various schemes and initiatives for education and employing the trans-genders.

Transgender employment rates in India

National Human Rights Commission's first study on transgender rights provides an insight into the situation of transgender people in these parts. Transgender people are denied employment rights in the country by 92 percent, with even qualified trans-genders being denied jobs [Kidd et. al. (2008)].

Approximately 490,000 trans people live in India according to the 2011 census, and only a small number of them have gainful employment. Although there are an array of initiatives underway to change this narrative. One Chennai-based start-up, for example, is working to integrate the transgender community, though its 14-month existence has seen it place only 42 trans people. Trans employment is therefore a pressing issue at the workplace.

There were 23 transgender people employed by Kochi Metro Rail Limited in 2017, but eight of them quit within a month because landlords refused to provide housing to them. Having no legal obligation and no incentive to provide them with assistance in such cases, they were left with no option but to quit their jobs (Spencer, L. G. (2014)).Transgender are among those who have performed exemplary work in their field, for instance, JoyitaMondal has become the first transgender judge in the country or SubamSibal has become the first transgender police inspector in Tamil Nadu.

Skill development training to trans-genders

In general, an ally is a person who is aware, knowledgeable, and skilled about dealing with discrimination, addressing injustice, and advocating for social justice. There are 2 types of LGBTQ ally programs: (a) programs that seek to establish visible networks of LGBTQ affirming support staff, faculty, and students and (b) enabling individuals to develop their ally skills (Collins et. al. (2021)). A good ally learns about the experiences LGBTQ students (including how they are perpetuated) and has skills to act as a resource and advocate. A sticker or button will often be displayed by allies, regardless of program type, to indicate their commitment to promoting a safe environment.

We examined how current programming can be used to prepare individuals to embrace the ally role, as it is conceptualized in the literature, by studying programs with a training component, known as LGBTQ ally training programs (ATPs) (Reed, O. M. (2021)). In the literature, concerns have been raised that ally programs tend to offer support to LGBTQ people, rather than addressing issues at the group and institutional levels. However, they failed to distinguish between training programs that included training and those that did not, and their conclusions are therefore not based on empirical data.

The Government initiatives for mainstreaming trans-genders throughemployment opportunitie

The desire for jobs which have dignity and the mainstreaming of trans-gender identities through employment seek to remove the stigma

attached to them in Kerala in the contemporary times. In the past, trans-genders in Kerala have migrated to cities in other states and joined the hijra community for home and to live in their transgender identity (Ekstrand et. al. (2003)). The transgender survey held in Kerala points at the employability and opportunities of employment for trans-genders in the state who wish to come back. The initiations from the government and the political activism in contemporary Kerala necessitate the need for recognizing transgender identity in Kerala by giving them respectable job and livelihood, hence trans-genders in the state have offered to be placed in the Kochi Metro project. Around 23 trans-genders were hired by the Kochi metro (Kurian et. al. (2021)). As the move was widely publicized, the media applauded the organization and the Kerala government as socially conscious employers. However many of the transgender employees could not find life smoother with the assured income (10,000 a month for the ticketing staff, 9000 for the housekeeping staff). As reported by LiveMint, most of the trans-genders employed in the Kochi metro are still to be accepted in the family. The job could not bring significant life change in terms of income, and they struggle to live a normal life. Another government initiative, Gender Taxi, is designed to ensure equal rights and opportunities for trans-genders in Kerala (Tiwari, G. (2020)). Gender taxis are owned and operated by trans-genders. It is an "equality taxi" in which all travelers, irrespective of their gender can avail service. Aimed at elevating the status of transgender community by helping them to become self-employed and independent Kerala government started a "Trans Welfare Co-operative Society".

Methodology

As a way of exploring the possible answers to the research question, this study utilized qualitative methods and tools. Both primary and secondary data were collected for this study. This study employed a purposive sampling methodology (Etikan et. al. (2016)). Whenever a face-to-face interview or a KII (Key Informant Interview) is scheduled as a site activity, semi-structured questionnaire

guidelines are used. Additionally, field observations were used to collect primary data in the study. Through observation, the everyday lives and work of trans-genders have been observed. The study has been carried out in Delhi city of India on a sample size of 100 respondents. The respondents chosen were from the third gender i.e. the trans-genders. In the present study the four skill development schemes which are being undertaken for the employment of trans-genders are Sweekruti, GarimaGreh, NitiAayog and Umbrella Scheme as represented in below mentioned table 1.

Statistical Analysis

A thematic arrangement was made after coding and arranging the data. Narrative analysis was used to analyze the data (story, experience, opinion, memory). Using research objectives to answer the research questions, data was analyzed thematically following data collection.

Various skill development initiatives

In the present study the four skill development schemes which are being undertaken for the employment of trans-genders are Sweekruti, GarimaGreh, NitiAayog and Umbrella Scheme as represented in below mentioned table 1. Shelter facilities, food, clothing, recreation facilities, skill development programs, yoga and fitness facilities, legal services, technical advice on gender transition and surgeries, capacity building for organizations that support transgender people, and employment are some examples.

Table 1. Skill development scheme for trans-genders

Schemes	No. of Participants
Sweekruti	25
GarimaGreh	20
NITI Aayog	23
Umbrella Scheme	32
Total	100

Source: primary data

Graph 1. Skill development scheme for trans-genders
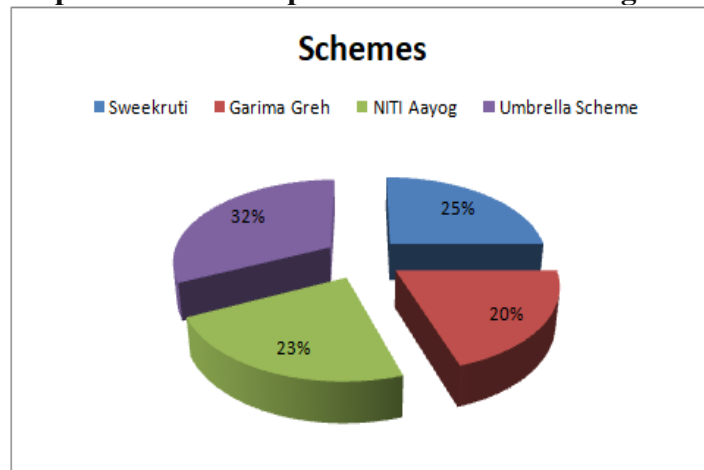
The below mentioned table 2. Represent the education status of trans-genders as education plays a crucial role in employment and skill development.

Table 2. Educational Status of trans-genders

Education	No. of Participants
Class 1 to 5	60
Class 6 to 10	18
Class 11 to 12	16
Graduate Degree	6
Total	100

Source: primary data

Among the total 100 participants of the trans-genders group from table 2. It could be seen that, 60 respondents have finished class 1-5, 18 have finished 6- 10th class, 16 finished the higher secondary school and 6 respondents have graduated.

There was a majority of respondents who reported not being able to complete their education. A hostile school environment, social stigma, and poverty forced them to leave educational institutions. The total number of transgender participants was somewhat higher than 60, who couldn't even complete class six.

Table 3. Represents the various skills which have been developed in the trans-genders through various schemes for their employment.

Table 3. Training Status of trans-genders

Training	No. of Participants
Computer	10
Craft	15
Embroidery	40
Beauty Parlour	12
Typing	23
Total	100

Source: primary data

The main training which are provided to the trans-genders for their employment are computer, craft, embroidery, beauty parlour and typing though they may be also engaging in other types of training as per table 3. It could be observed that the maximum number of respondents are engaged in embroidery.

The below mentioned table 4. Represents the impact of various training provided to the trans-genders. This table would assist in studying whether these training skills had either a positive or negative impact in the employment of trans-genders.

Table 4. Impact of training on trans-genders

Training	Agree	Neutral	Disagree
Computer	18%	42%	40%
Craft	44%	47%	9%
Embroidery	52%	27%	21%
Beauty Parlour	21%	32%	47%
Typing	5%	18%	77%

Source: primary data

Results

In the present study the four skill development schemes which are being undertaken for the employment of trans-genders are Sweekruti, GarimaGreh, NitiAayog and Umbrella Scheme as represented in below mentioned table 1. In addition to shelter facilities, food and clothing, recreational facilities, skills development opportunities, yoga and physical activities, library facilities, legal assistance, advice regarding gender transition and surgeries, and capacity building of trans-friendly organizations, these services are also available. The main training which are provided to the trans-genders for their employment are computer, craft, embroidery, beauty parlour and typing though they may be also engaging in other types of training as per table 3. Thus from table 4, it could be concluded that most of the trans-genders are employed in embroidery as the embroidery training had the maximum positive effect on trans-genders. As 52% respondents agreed to the embroidery training, 27% remained neutral and 21% disagreed with it. After embroidery the respondents were employed in craft making as 44% of them agreed with its training, 47% remained neutral and 9% disagreed with it. The respondents who agreed with the training of beauty parlour and computer were 21% and 18% respectively. Typing came in high on the list of most

disagreed training programs as most respondents could not finish their education with this program. Due to the adverse school environment, societal stigma, and poverty, these students had to leave educational institutions. Among the total number of transgender participants, 60 admit that they are unable to complete the sixth grade.

Discussion and conclusion

When transgender people are recognized legally, the work question arises. It is important for basic civil rights to have identification documents such as voting rights, education rights, inheritance rights, public health services, etc. There are biases in hiring, discrimination at work, wage inequalities, inaccessible documents, and lost benefits that hamper employment opportunities for trans people. Trans persons can lead a productive and healthy life by promoting equality in the workplace, as well as eliminating harassment at workplaces. Indian human rights activists continue to be concerned about the discrimination faced by transgender people. Due to the stigma that the trans community faces, they are systematically excluded from benefits and are exempt from acceptance. Among the consequences of this are harassment and inadequate school education. Thus, beggars and those who work in sex shops become the only means to earn a living. In addition to being subjected to the risk of sexually transmitted diseases, being compelled to perform sex work takes away their agency over their bodies and violates their fundamental rights. The transgender community continues to be marginalized in society. There are many challenges, particularly as it relates to inclusion.

Equal opportunities for education and livelihoods should be ensured. From schools, colleges to place of work, we need to prepare and sensitize ourselves to welcome transgendered persons, and to prevent discrimination against them. Children in the transgender community need the same types of education that are provided for EWS, girls, and physically disabled so that they can find employment without being discriminated against.

The changing nature of society has brought many changes, but the transgender community remains faced with a number of employment challenges. As a society, change has to begin at home. Transgender people are not less human than us. They have dreams and aspirations just like us. There are times when they lack the means to accomplish those dreams, and we can be a part of the journey. Treating them with respect is the least we can do.

The workplace must do more to accommodate transgender individuals. This includes hiring transgender people, providing bathrooms for the third gender, fighting misconduct and harassment, and providing insurance. In addition, we must treat them equally in our society to ensure that they are more inclusive.

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INTERNET OF MEDICAL THINGS (IoMT) IN HEALTHCARE: A SURVEY

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ABSTRACT

The Internet of Things (IoT) could be a wireless network interconnected and linked through smart devices, accumulating, transmitting, and storing data in a cloud while not requiring interaction between man to man or man to system. The Internet of Medical Things (IoMT) is a subset of the IoT framework that focuses on interaction via smart medical devices. Although the IoT interaction promotes as well as continues to support our daily operations activities. It's currently a lot more essential than ever to understand; however, developed and advanced IoMT technologies will facilitate tending suppliers to provide safe care. IoMT has several advantages, such as delivering digital health services by monitoring patients' health parameters from a distant area, delivering healthcare services to the aged, and monitoring a significant number of people in a country or region for identification and avoidance of outbreak. This perspective paper aims to understand recent IoMT technology in health care to highlight that IoMT devices are working to improve medical care delivery and to describe that IoMT technology will significantly impact and disrupt worldwide medical services in the upcoming years.

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Keywords: IoMT, Sensors, IoMT Applications, IoMT Services, Real-time, Remote Monitoring.

Introduction

In science, the Internet of Medical Things (IoMT) is among the most exciting fields. Sensor generated data can be processed, and decisions are taken accordingly in the device. These smart devices are incorporated with the software to manage various sections and activities in them. The IoMT is a modern technology that includes intelligent objects with keys devices such as sensors and actuators to detect the physical parameters of the individuals and take action depending on the data gathered [1]. Sensor generated data can be processed, and decisions are taken accordingly in the device.

The IoMT model incorporates the benefits of cloud networking, wifi, advanced technology, fog computing, autonomy computing, and sensors to build new possibilities and avenues in diverse fields [2]. As a result of the introduction of IoMT, people live longer and encourage themselves to rely for long periods upon and chronic treatment has now been prioritized.IoMT contributes significantly to the development of medical services toward intelligent healthcare. The following needs in smart medical care: (i) The needy patient should be given treatment at the appropriate time (ii) Physicians are allowed to diagnose and treat diseases correctly (iii) Facilitates the sharing and collaboration of information effectively for all stakeholders (iv) Warn patients to participate appropriately in their therapy, to allow for data availability at a readily available location. Real-time monitoring of patients' conditions by the healthcare provider enables advancement in wireless transmission of data and implementation of IoMT technology. (v) Make medical care available to remote areas due to its economic models [3]. Individual vital health conditions such as blood pressure, respiration rate and cardiac rate may be measured in a single contact using portable instruments. WLAN, artificial intelligence (AI), and cloud-based, remote health assessments are available to support the Cellular Body Area Networks. An early warning system is helpful to monitor the spread of infectious diseases by using the IoMT functional components such as the selection, storage, transmission and analysis of information [4].

Healthcare Services and Applications

IoMT-based healthcare systems have recently made real-time applications feasible in the healthcare field, unleashed full potentials in the healthcare sector for IoMT and excellent medical services supported by doctors. IoMT improved patient involvement and satisfaction because patient and doctor interactions became more effective and accessible. In general, remote monitoring prevents readmission and

also decreases the time spent in hospitals. Its results in an essential effect on healthcare costs and patient outcomes to be minimized and enhanced by these emerging innovations. IoMT enhances the health sector through the evolution and interaction of a new range of IoMT connected medical devices in the health systems; many more IoMT medical applications built to support patients, families, doctors, and hospitals [5]. To understand this broad area, we divide medical applications into two main fields, as shown in figure 1.

Figure 1: IoMT Healthcare Services and Applications
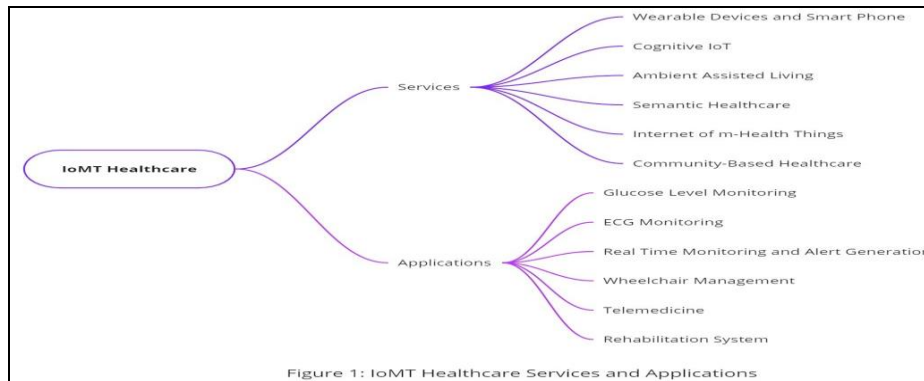
The first supports the concept with services that emerge when IoMT converge in healthcare, while the second focuses primarily on healthcare applications.

Healthcare Services

By providing various services to the research community, IoMT revolutionizes the medical system, and each service offers a new concept for healthcare applications. New services are continuously developing as health care systems are built, becoming key channels for health applications. The following parts emphasize some of IoMT's fundamental healthcare programmes.

(i) Wearable Devices and Smart Phone

Wearable devices minimize the expenses for healthcareproviders and patients, having various benefits. Numerous non-intrusivesensors, especially for WSN-based medical services, have been developed fordifferent healthcare applications such as caps, smartwatches, wristbands,headbands, etc. [6]. Many sensors embedded in these intelligent devices allowusers to collect their health parameters or surroundings data and upload theminto real-time processing. There is a range of desirable characteristics inwearable devices appropriate for the IoMT framework.

(i) Cognitive IoT (CIoT)

Cognitive computing means an intelligent computer capable of imitating the human brain while troubleshooting. CIoT promotes numerical data, displays trends in a large volume of data, and increases the sensor's capability to process and adapt automatically to the surroundings. Within a personalized CIoT system, all body sensors or sensors mounted in the environment need to interact and other intelligent devices to efficiently monitor the patient's health. IoMT is intelligent enough to make time-saving assessments based on accumulated information for a cognitive-driven medical system [7].

(ii) Ambient Assisted Living (AAL)

AAL is a relatively recent IT movement, which provides support and treatment for the elderly to live independently in their surroundings. An Artificial Intelligence IoMT platform that addresses the well-being of elderly and disabled people is called Ambient Assisted Living. AAL aims to expand the independent life of senior people in their living place comfortably and securely. AAL apps use cloud computing to handle data obtained from all these devices, evaluate and acknowledge the particular activities of an individual, so that remote monitoring is available in real-time and emergencies can respond to them [8].

(iii) Semantic Healthcare

Semantics and ontology use to conserve and treat an enormous volume of clinical data in medical systems. Semantics and ontology leading the IoMT framework allow for collecting information sharing between various

wearable devices in healthcare [9]. In addition, a semantic structure for the healthcare system introducing supports transmission among multiple IoMT devices and its rule engines used by IoMT-health applications to examine vast quantities of sensor data stored in the cloud [10]. In the case of medical services crisis, the data could be access from anywhere for collecting, integrating and informative to analysis for better treatment.

(iv) Internet of mHealth Things (IomHT)

IomHT was an influential area of medical services; cloud computing, sensors, and mobile computing use to track patients' health parameters in real-time and transfer data to a cloud computing system using Communication Technology. Healthcare providers should collect data for the efficient and timely observation, diagnosis and treatment of the patients. In future, it can be the basis for inventive IoMT in healthcare applications as it offers entirely interconnected through mobile features [11].

(v) Community-Based Healthcare (CH)

Public healthcare monitoring depends on the network that covers a region surrounding by local people. In a community-based healthcare system, interconnected networks form a collaborative structure, and multiple networks concentrate as a cooperative network structure. A specialized service called community healthcare (CH) can inevitably comply with collective technological needs as a bundle. There is a different system for authentication and authorization since it is a cooperative network [12]. A community medical network combines many WBANs for CH.

IoMT in Healthcare Applications

There are different medical applications launch for practicing the above facilities of IoMT services. This segment deals with wearable technology, healthcare sensors, portable and recent medical devices. Sensors enable health care providers to monitor a patient's condition in real-time and deliver an accurate diagnosis. To make use of sensors to monitor the data the user wants while working out or tracking the quality of sleep. Many forms of clinical sensors assess blood pressure, blood glucose, arterial oxygen, heart pulse etc. patients or doctors may be alerted when there are problems. In table 1, the applications of IoMT shows as:

Table 1: IoMT Applications in Healthcare

Conditions	Devices	Roles of IoMT and Connection
Diabetes	Glucose Sensor	The sensor data is transmitted to local storage and data processing, then for analysis sent to the cloud and notification to the responsible Doctors if emergencies occur.
Heart Disease	BP Sensor, ECG Sensor	The information is transferred by a wireless transmitter to a sensor and then forwarded to the servers via a relevant device portal.
Wheelchair management	Accelerometer, Camera Sensor, Force Sensor	The system incorporates sensors to wheelchair transmitters, manages irregularities, and transfers information to the web server via a suitable platform.
Rehabilitation	RFID Tracking Sensor	The device integrates the signals into the network processes and interacts with the remote device through wifi or a smartphone portal.
Blood Pressure Monitoring	BP Sensor, Oscillometer Sensor	A device for BP data collection and transmission through an IoMT network and stored in the cloud.
Oxygen Saturation Monitoring	Pulse-oximeter Sensor	The pulse oximeter embedded with the IoMT sensor helps to collect data for oxygen levels in the blood.
COVID - 19	Temperature Sensor, Glass Sensor, Head Sensor	Technology to receive reliable data analysis and processing used on or to improve patient medicare safety.

(i) Glucose Level Monitoring

Diabetes is one of the largest outbreaks and expensive healthcare disorders. Finger

pricking, accompanied by the estimate by glucose level with a blood glucose meter, is a commonly used way to draw a blood sample for diabetes diagnosis. However, it is an uncomfortable procedure to get blood from the hands of patients. A hazardous process such as infected devices may expose a patient to a blood-borne infection during finger pricking. Recently, wearable devices increasingly use to measure glucose levels due to the integration of IoMT in healthcare since they are more accessible, convenient and safer [13].

(ii) ECG Monitoring

ECG monitoring involves electrocardiogram assessment of the simple heart rate and determining the specific rhythm and diagnosis of irregular heartbeats, heart attack and more extended QT periods. The monitoring process carries out by electrical activity. Integrating IoMT into ECG monitoring is likely to alert users of heart failure, which is a crucial indicator of early detection of heart disease [14]. Recently emergence of smartwatches and HR monitors are essential features of these smart devices.

(iii) Real-Time Monitoring and Alert Generation

Children, seniors or critically ill people tend to investigate nearly every day, some of which go ignored before their health transmit into the critical process due to their vital role. In the provision of real-time healthcare, the constant monitoring of numerous health parameters such as blood pressure, heart beating and temperature occupies an essential part. The IoMT can be used to install sensors on a human body and calculate various health vital parameters that could be analyzed to show patients in emergencies medication they need for treatment [15].

(iv) Wheelchair Management

It plays an important role not only physically but also mentally to help people with disabilities. In the day-to-day work of disabled people, the use of smart wheelchairs makes it easier than ever to be more independent. As a result, an electric wheelchair address with an intelligent and simpler navigation device. Wheelchair control is establishing an IoMT-

based steering system with an intelligent wheelchair preventing process in real-time. Software embedded system that enables incapacitated person to communicate easily with wheelchair via a smartphone app which investigates sensor data and analyses by healthcare provider from a remote location [16].

(v) Telemedicine

It focuses on providing patients with remote healthcare through the use of ICT services. The medical staff's administrative expenses decreased, and the patient's condition effectiveness increased [17].

(vi) Rehabilitation System

It includes a series of processes that assist patients with disabled in maintaining and achieving optimal physical, mental and social skills. The orientation, ultrasound and strength sensors use in a walker-based remedial exercise system, and after using, the innovative walker in which movement measurements were constantly monitored and submitted to the cloud [18]. Information was then analyzed and uploaded in web and also mobile apps updated.

Conclusion

In many healthcare applications and facilities, IoMT has a wide range of healthcare applications as it progresses day after day. This paper, an overview of IoMT technology in the field of healthcare, are discussed. First, technologies such as sensors and WBANs are mentioned briefly for smart health care, for the popularity of IoMT based wearable sensors among people granted emphasis due to their noninvasive nature. Next, we discussed the wearable sensor for IoMT services in AAL, IomHT, Smartphone, Semantic Healthcare, CIoT and CH-based healthcare. Other vital components of its applications such as Real-Time Monitoring and Alert Generation, ECG Monitoring, Glucose Level Monitoring, Telemedicine, Wheelchair Management and Rehabilitation System were utilizing IoMT based technology. It offers healthcare services an opportunity for efficiently and effectively predicting medical problems, including diagnosing, treating and monitoring patients both inside and outside the hospital. As

technology-based healthcare systems implement to facilitate medical procedures to provide scalable care models, the rise of conventional medical services are being supplemented or substituted by IoMT.

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HOMESTAY TOURISM IN MALAYSIA

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ABSTRACT

*Homestay can termed as "**a period during which a visitor lives with a local family"**. Homestay is making tourists stay with a local family in a village or town with the idea of experiencing the local people culture, lifestyle and nature. Homestay culture is fastly developing in several countries. Malaysia is a fast developing country which is frequented by South East Asia tourists to a large extent. The tourism attractions in Malaysia include wild jungles, beautiful beaches, various types of diving and lovely food. Community based tourism and home stay are the latest trends in tourism in Malaysia.Homestay operators perception and their demographic profile,household size education food variety age and perception on social impact of homestay are analyzedin this research paper. Though there is a steady increase in homestay tourism in Malaysia the tourist department should organize professional training for homestay operators and hotel staff at periodical intervals to have a high standard and hygienic condition inhomestays. The suggestions provided in the research, may increase the economic benefit of the rural areas in Malaysia.*

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Keywords: *Malaysia, Homestay, Community based tourism, Economic benefits, Perception.*

Introduction

The tourism in Malaysia is developing with positive sign and the income from tourism industry is appreciable for national income. Among the different type of tourism, the Homestay tourism is gaining momentum and government also encouraging this community-based Homestays tourism to improve the economic status of the rural area and there by developing rural tourism in the country. The government of Malaysia took the Homestay tourism as a tool to eradicate poverty in rural areas. The inflow of tourists to this niche Homestay is steadily improving and international tourists too opting to participate in the Homestay tourism. This research paper discusses the tourism in Malaysia, Community based Homestay in Malaysia and perception of the Homestay operators and tourist visiting Malaysia.

Tourism in Malaysia

In Asia, the Malaysia's tourism development is actively developing next to manufacturing sector. The tourism industry is the second largest contributor for the economic and social development. The Ministry of tourism focusing mainly on infra structure developments like road, water supply, electricity, tourism hotels etc. to attract a greater number of tourists at national as well as international level. The Ministry has designed special strategy to maintain the tourist destination with good quality consciousness in order encourage the tourists to visit frequently. Due to the effort of the tourism ministry, the number of tourists visited Malaysia is in increasing trend. The following data confirms the growth of Malaysian tourism industry.

TABLE: 1
TOURISM ARRIVALS AND RECEIPTS TO MALAYSIA

Year	Arrivals in million	Receipts in RM in Billion
2019	26.1	86.143
2018	25.83	84.135
2017	25.95	82.16
2016	26.76	82.1
2015	25.72	69.11
2014	27.44	71.99
2013	25.72	65.44
2012	25.03	60.6

2011	24.71	58.3
2010	24.58	56.5
2009	23.65	53.4
2008	22.05	49.6
2007	20.97	46.1
2006	17.55	36.3
2005	16.43	32.0
2004	15.70	29.7
2003	10.58	21.3
2002	13.29	25.8
2001	12.78	24.2
2000	10.22	17.3
1999	7.93	12.3
1998	5.56	8.6

Source: http://corporate.tourism.gov.my/research.asp?page=facts_figures

From the above table, it is inferred that every year there is a growth in number of tourists visited Malaysia except year 2003. In the year 1998, tourist's arrival was 5.56 million and that of in 2013 is 25.72 million. The total receipts also grown from 8.6 billion RM to 65.44 billion RM between 1998 and 2013 in a span of fifteen years.

Community based Tourism in Malaysia: The government has considered the tourism industry in Malaysia as an engine for economic, social, political, and ecological development, especially in rural areas. According to Asia Pacific Economic Cooperation, the Community Based Tourism will create good employment opportunities and the increases the income level at local.By understanding this mission and realizing the potential for CBT, the Malaysian government has formulated rural tourism plan in 2001. The government of Malaysia in the ninth plan (2006-2010), has focused rural development through two-fold strategies, one is to reduce income imbalance between rural and urban income and other is to reduce income balance between less developed and more developed states.

Homestay is considered as a new segment of the tourism industry because there is a trend towards an increased specialization among tourists and an increasing concern about the environment. As a result, the government has been giving the Homestay Program special emphasis through the 9th Malaysia Plan, resulting in a total of RM40 million being allocated for developing infrastructure facilities in rural areas. According to Yahaya, a researcher, the program was supported by government in developing the infrastructures, super structures and transportation and roads.

Homestay in Malaysia: The Homestay business increased every year. In 2009, the growth of income is 77 %, which is RM 10.9 million, when compared to RM 10.9 million in 2008

The tourists who stay in this accommodation are increased 77% in this period. Furthermore, total income of Homestay entrepreneurs was RM 8.9 million and average occupancy rate of Homestay were 22.7% within the period of January to October in 2010. The demand for a homestay product in Malaysia has increased in the past ten years. The Ministry of Tourism, Arts and Culture, Malaysia, reported 56% in homestay clusters and a 74% increase in villages for the homestay program from 2009 until 2019 (MOTAC, 2020). The annual revenues for homestay businesses showed a substantial increase of more than 300% in these ten years. Table 2 shows the progression of homestay businesses in Malaysia from 2009 to 2019.

Despite the enormous progress of homestay performance in Sabah, it is found that homestay businesses' performance in different villages is not at the same pace. Some homestay villages are progressing very well than others, and some are less performing despite similar government support (Shahudin, 2017). It was postulated that these differences might be due to several factors relating to the ability of the homestay entrepreneurs to manage their businesses, Kayat *et al*. (2016), geographical location, Shahudin (2017) and managerial-related issues,

Pusiran and Xiao (2013), which was mentioned in their works as significant for business

performance.

TABLE: 2

THE PROGRESS OF HOMESTAY BUSINESSES IN MALAYSIA (NUMBER OF HOMESTAY, VILLAGES, PARTICIPANTS AND REVENUES) FROM 2009 TO 2019

Description/Ten Years Duration	2009	2019	Increased
Number of Homestay Cluster/Coordinator	140	219	56%
Number of Villages	227	394	74%
Number of Entrepreneurs/Operators	3264	4210	29%
Number of Rooms	4463	5956	33%
Annual Revenue (RM)Millions	6.25	29.66	375%

Source: MOTAC (2020)

Many previous studies have also contended that small business owners might require different leadership capacities to lead the business effectively. For example, Kamisan Pusiran and Xiao (2013)found that leadership skills were essential to drive positive homestay business performance in their study on homestay programs in Malaysia. Their research was in line with Jabar *et al*. (2015), who discovered that the combination of community participation and entrepreneurial leadership skill had a significant influence on homestay business performance. Similarly, Kayat *et al*. (2016) proved that homestay entrepreneurs' leadership behaviour was one of the critical factors driving and motivating the community to participate actively and perform well in the homestay business.

In many entrepreneurial studies, person-related factors like personality traits, personal knowledge and skills, and motivations have always been significant to business performance (Tosun and Sezgin, 2021; Kerr *et al.*, 2018). Many scholars contended in much previous research that a person's capability to lead an enterprise might influence enterprise performance

In the 21st-century, many scholars have been focused on the impact of entrepreneurial leadership behaviour on innovation and venture performance. However, most studies have been concentrated on larger enterprises from the managerial perspective (Arifin, Firmanzah, Fontana and Wijanto, 2016); Chaiyakhet, 2014). There is still a lack of studies on leadership behaviour among community-based business owners like homestay entrepreneurs, especially in rural areas. It is presumed that community-based small businesses in rural areas might face a more complex range of challenges than larger firms or enterprises in urban areas. Thus, it is postulated that the homestay entrepreneurs might employ a different leadership style towards achieving high business performance.

Tourists' arrival Vs Number of Tourists preferred Homestay: The total number of tourist arrival in 2010, 2009, 2008,2007 and 2006 are 24.6 million,23.6 million, 22 million,20.9 million and 17.4 million, respectively. The total number of tourists stayed in Homestay between 2006 and 2010 are 14458,21368, 23117, 31523, 49126. By comparing the total tourist arrival to Malaysia between the year 2006 and 2010 and that of stayed in Homestay, the percentage of tourists to Homestay are 0.08,0.10, 0.11,0.13, and 0.19.

TABLE:3

TOURIST ARRIVAL TO HOMESTAY IN MALAYSIA

Year	Tourist Arrivals in Million	Tourist stayed in Homestay	Percentage
2010	24.58	49126	0.199
2009	23.65	31523	0.133
2008	22.05	23117	0.104
2007	20.97	21368	0.101
2006	17.55	14458	0.082

Source: Ministry of Tourism, Malaysia, 2011

The above table shows that there is a steady increasing rate of tourist visiting Malaysia between 2006 and 2010 due to aggressive promotional effort by the Ministry of Tourism, Government of Malaysia. However, the homestay program does show any significant impact when compared to total tourist arrival to Malaysia and the percentage of tourists preferred Homestay is less than 1 percent.

Homestay Operators perception: The main objective of this study is to analyze the profile of the homestay operators, to assess the facilities available in the homestay, to find out the perception of social impact on homestay, to assess the satisfaction level of homestay operators and finally to provide better suggestions for the development of homestay operations.

Scope of the study: The study is confined to homestay operators in Malaysia, and it focuses

its attention on homestay facilities, cost of facilities and hospitality services offered, social impact of homestay and operators satisfaction. Finally, it provides valuable suggestions for development of homestay.

Methodology: Descriptive study method is used, and data is collected from various sources like primary and secondary. The study involves a survey of 100 homestay operators in Malaysia. Unrestricted, non-probability convenience sampling technique is applied in the research.

Demographic profile of the Homestay operators: The demographic details will be highly useful tourism planners and it contains sex, age, educational level, and income.

Sex: Out of hundred homestay operators, 70 percent are male and remaining are female.

TABLE: 4
SEX

Sex	Number of Homestay Operators	Percentage
Male	70	70
Female	30	30
Total	100	100

Source: Primary data

From the above table it is observed that majority of the homestay operators are male, and it is inferred that male are interested in managing the homestay.

Age of the Homestay Operators: Out of 100 operators surveyed, 6 percent of the operators are in the age group of 30 and 39, 38 percent are 40 and 49, 32 percent are 50 and 59, 6 percent are 60 and 69 and remaining are above seventy years age.

TABLE: 5
AGE OF THE HOMESTAY OPERATORS

Age in Years	Number of Homestay Operators	Percentage
30-39	6	6
40-49	38	38
50-59	32	32
60-69	18	18
70 and above	6	6
Total	100	100

Source: Primary data

The above indicates that majority of the homestay operator' age are between 40 and 59.

Household size: Out of 100 respondents, 25 percent are having family size of 5 people in

their family, 60 percent are having 6 -7 people and remaining are having more than 7 people.

TABLE: 6
HOUSEHOLD SIZE

Family size	Number of respondents	Percentage
1-5	25	25
6-7	60	60
More than 7	15	15
Total	100	100

Source: Primary data

From the above table, it is observed that majority of the homestay operators are having family size between 6 and 7.

Education: Education will play a major role in managing the homestay business . Out of 100 respondents surveyed, 25 percent of the homestay operators are completed school education, 31 percent are diploma holders, 38 percent are completed their degree, and remaining are Post – graduates.

TABLE: 7

EDUCATION

Education detail	Number of Homestay operators	Percentage
School Education	25	25
Diploma	31	31
Degree	38	38
Post-Graduate	06	06
Total	100	100

Source: Primary data

The above table indicates that majority of the homestay operators are either diploma or university graduates.

Experience in Homestay operation: Experience in business will help to take better decisions and improve knowledge and skills in the working area. Out of 100 respondents, 56 percent of the homestay operators are experience from 5-10 years, 25 percent are having 11-20 years of experience and remaining are having more than 30 years of experience.

TABLE: 8

EXPERIENCE IN HOMESTAY OPERATION

Experience in years	Number of Homestay Operators	Percentage
1 – 10	56	56
11 – 20	25	25
21 -30	19	19
Total	100	100

Source: Primary data

From the above table it is understood that majority of the operators are having 1 to 10 years of experience.

Number of Rooms in Homestay: Out of 100 respondents, 19 percent are having one room, 75 percent of the operators are having two rooms and remaining are having more than three rooms.

TABLE: 9

NUMBER OF ROOMS IN HOMESTAY

Number of Rooms	Number of Operators	Percentage
One	19	19
Two	75	75
Three	6	6
Total	100	100

Source: Primary data

The above table indicates that majority of the homestay operators are having two rooms for the tourists to stay.

Homestay Room rent per day: The room rent for the homestay includes accommodation, breakfast. Out of 100 respondents, 32 percent of the homestay operators are charging Rs.1000 to 1500 per day, 42 percent are charging Rs.1501 to 2000, 18 percent are charging Rs.2001 to 2500 and remaining are charging more than Rs.2500 per day.

TABLE:10
HOMESTAY RENT PER DAY

Room rent per day in Rs.	Number of Homestay operators	Percentage
1000-1500	32	32
1501 -2000	42	42
2001 – 2500	18	18
More than 2500	08	08
Total	100	100

Source: Primary data

The above data clearly indicates that majority of the homestay operators are charging room rent per day between Rs.1000 and Rs.2000.

Food variety available: The Homestay operators serve food to the tourists staying in Homestay. Out of 100 respondents, all the operators are providing their delicious traditional foods, 20 percent homestay operators are providing food based on the tourist choice.

TABLE:11
FOOD VARIETY AVAILABLE

Food type	Yes	No
Traditional Food	100	00
Customized food	20	80

Source: Primary data

The above table indicates that majority of the homestay operators are serving traditional food to the customers.

Operators' perception on social impact of Homestay: Perception on social impact of Homestay includes, "itgeneratesemployment for local people", "it is useful to create attention on traditional culture", "it is enhancing social parity of local people", "itenhancesexcellence of life", "it is useful for preservation", and "Homestay is helpful for eco-system". "Homestay is helpful to focus traditional culture" scored highest points (418) and stood first rank, followed by "Homestay creates employment opportunities for local people" (410 points), "Homestay improving social equity of local people" (403 points), "Homestay increases quality of life" (398 points), "Homestay is helpful for conservation" (394 points), and "Homestay is helpful for eco-system" (389 points).

CA – Completely Agree   A- Agree   MA – Moderately Agree   DA – Disagree CDA – Completely Disagree

TABLE:12
OPERATORS PERCEPTION ON SOCIAL IMPACT OF HOMESTAY

Statements	CA		A		MA		DA		CDA		Total	Rank
	No.	Score	No.	Score	No.	Score	No.	Score	No.	Score		
Homestay is helpful to focus traditional culture	33	165	52	208	15	45	00	00	00	00	418	1
Homestay creates employment opportunities for local people	31	155	48	192	21	63	00	00	00	00	410	2
Homestay is improving social equity of local people	28	140	47	188	25	75	00	00	00	00	403	3
Homestay increase quality of life	25	125	48	192	27	81	00	00	00	00	398	4
Homestay is helpful for conservation	24	120	46	184	30	90	00	00	00	00	394	5
Homestay is helpful for eco-system	22	110	45	180	33	99	00	00	00	00	389	6

Source: Primary data

The above table indicates that the Homestay in Malaysia is focused on traditional culture of the operator's area. It also provided good employment opportunities for local people and thereby improving the social equity of the local people. It is understood that Homestay increases the quality of life and helpful for eco-system and conservation.

Facilities provided in the Homestay: The facilities offered includes cot with bed, TV, Internet access, laundry service, Family room, Garden to relax, BBQ facilities, Car Park, Transportation facilities, Additional toilet bathrooms, Cloth dryer, Refrigerator, Microwave, dressing room, Hair dryer, guide, and shopping facilities. All the homestays are having facilities with cot and bed, Television with satellite channels, car park, transportation facilities. 90 percent of the operators are having internet facilities, 80 percent have laundry facilities, 60 percent offers family room and refrigerator and microwave, 30 percent has garden to relax and cloth dryer, 70 percent have BBQ facilities and hair dryer, 60 percent have cycle rental and guide facilities, 45 percent have additional toilet and bathroom facilities and dressing room, and 70 percent of the Homestay operators facilitate in shopping.

TABLE:13

FACILITIES PROVIDED IN THE HOMESTAY

Facilities	Yes	No
Cot with bed	100	00
TV with satellite channels	100	00
Internet Access	90	20
Laundry service	80	20
Family room	60	40
Garden to relax	30	70
BBQ facilities	70	80
Bicycle rental	60	40
Car Park	100	00
Transportation facilities	100	00
Additional toilet &Bathroom	45	55
Cloth dryer	30	70
Refrigerator	60	40
Microwave	60	50
Dressing room	45	55
Hair dryer	70	30
Guide facilities	60	40
Facilitate in Shopping	70	30

Source: Primary data

From the above table it is understood that the facilities like TV, Cot with bed, car park and transportation arrangements are made by all operators.

Other Facilities: The other facilities include accompanying tourists during their visit to destination places, explaining about the importance of tourist attraction and local culture, accompanying tourists during shopping, arranging meeting with local people and arranging cultural performance. Out of respondents, 90 percent of the homestay operators accompanying tourists during their visit to tourism places, 90 percent of the operators explaining about the local culture and importance of tourism destinations, 80 percent accompanying tourists during shopping, 60 percent arranging cultural performance and 70 percent of the homestay operators arranging meeting with local communities.

TABLE: 14
OTHER FACILITIES

Facilities	Yes	No
Accompanying tourists during their visit to tourism places.	90	10
Explaining about the importance of tourists attractions and local culture	90	10
Accompanying tourists during shopping	80	20
Arranging cultural performance	60	40
Arranging meeting with local people	70	30

Source: Primary data

Perception about the role of Tourism department: The Ministry of Tourism and Culture has taken several steps to improve the Homestay programme under the rural tourism banner. The objective of homestay to improve standard of living and income of the local people and help visitors to feel means and culture of local people. To achieve this objectives Tourism department is playing important role for the successful operation of homestay business.

TABLE: 15
PERCEPTION ABOUT THE ROLE OF TOURISM DEPARTMENT

Factors	HS		S		MS		DS		CDS		Total	Rank
	No.	Score	No.	Score	No.	Score	No.	Score	No.	Score		
Infrastructure Development	25	125	45	180	30	90	0	0	0	0	395	1
Marketing	20	100	42	168	38	114	0	0	0	0	382	3
Training	22	110	43	172	35	105	0	0	0	0	387	2
Counseling	18	90	41	164	41	123	0	0	0	0	377	5
Enforcement	20	100	40	160	40	120	0	0	0	0	380	4
R &D for Homestay	15	75	40	160	45	135	0	0	0	0	370	6

Source: Primary data

The major factors include training for homestay operators, infrastructure development, marketing, counseling, enforcement, and R &D for homestay operators. Out of 100 respondents surveyed, "the infrastructure development" scored highest points (395) and stood first rank, followed by "Training" (387 points), "Marketing" (382 points), "Enforcement" (380 points), "Counseling" (377 points) and R and D for Homestay".

Findings

➢ In the year 2019, 26.1 million tourists visited Malaysia and total receipts is 86.143 billion RM.

➢ The number of Homestay cluster is increased to 219 in 2019, which 56% increase when compared to the year 2009.

➢ The total number of villages benefited out of homestay is 394 in 2009 and the total number of operators are 4210.The number of rooms available for tourists in homestay is 5956 in the year 2019 and annual revenue generated is 29.00 million, which is 375 percentage growth compared to the year 2009.

➢

he percentage of tourist stayed in Homestay compared to total tourists' arrival in the year 2010 is 0.199. Homestay is less than one percent.

- ➢ Majority (70%) of the Homestay are operated by male.
- ➢ Majority (60 %) of the homestay operator's age are ranging between 40 and 59.
- ➢ Most (60 %) of the homestay operators household size is 6 to7.
- ➢ Majority (69 %) of the homestay operators' education is diploma or degree.
- ➢ Fifty-six percentage of the homestay operators are having experience between 1 to 10 years.
- ➢ eventy-five percentage of the homestay operators are having two rooms for the tourists.
- ➢ eventy-four percent of the homestay operators charging room per day between 60 and 12 RM.
- ➢ lmost all the homestay operators are providing traditional food to the tourists and 20 percent of the operators are serving customized food.
- ➢ n the perception on social impact on homestay, "Homestay is helpful to focus traditional culture" scored highest points (418) and stood first rank, followed by "Homestay creates employment opportunities for local people" (410 points), "Homestay improving social equity of local people" (403 points), "Homestay increases quality of life" (398 points), "Homestay is helpful for conservation" (394 points), and "Homestay is helpful for eco-system" (389 points).
- ➢ All the homestays are having facilities with cot and bed, Television with satellite channels, car park, transportation facilities. 90 percent of the operators are having internet facilities, 80 percent have laundry facilities, 60 percent offers family room and refrigerator and microwave, 30 percent has garden to relax and cloth dryer, 70 percent have BBQ facilities and hair dryer, 60 percent have cycle rental and guide facilities, 45 percent have additional toilet and bathroom facilities and dressing room, and 70 percent of the Homestay operators facilitate in shopping.
- ➢ The major factors include training for homestay operators, infrastructure development, marketing, counseling, enforcement, and R &D for homestay operators. Out of 100 respondents surveyed, "the infrastructure development" scored highest points (395) and stood first rank, followed by "Training" (387 points), "Marketing" (382 points), "Enforcement" (380 points), "Counseling" (377 points) and R and D for Homestay".

Suggestions

- ✓ The tourist department must organize training for the homestay operators and housekeeping staff at regular interval to ensure the cleanliness and hygienic conditions in homestays.
- ✓ Training on Online marketing must be arranged for coordinators to attract a greater number of tourists for homestay accommodation.
- ✓ The operators organize video show on important tourist attractions in the region, for the tourists to have better perceptions before making visit plan.
- ✓ Arrange meeting with local community people to have better understanding about the culture of the people.
- ✓ Government should motivate women organization to involve in managing and developing homestay business and provide subsidy to encourage more women to participate in this activity.
- ✓ Homestay operators often interact with tourists and make them to feel comfortable in their stay.
- ✓ Operators should ensure the cleanliness and hygienic conditions in the homestay environment,
- ✓ Homestay coordinators should guide the tourists during their visit to different tourist places and accompany them during the local purchasing.
- ✓ Lawn maintenance, carpet cleaning and pipe leakage should be done periodically.
- ✓ Provide wi-fi connectivity in and around the homestay facility, to access the internet.
- ✓ Improve the standard of homestay to star category and provide better service to customers.

✓ Get the feedback from their visitors while vacating and make note of the important points and immediately correct it

Conclusion

The Homestay in Malaysia was launched in 1995, to cater the needs of international groups and youth associations from Japan. This business gradually developed through offering affordable accommodation to eco-tourists. Given the high cost of accommodation in rural areas for the tourists coming to visit ecotourism spots, homestay is offering cost effective boarding and lodging facilities. The Ministry of Tourism and Culture made perspective plan to develop Homestay business for the benefit rural residence. It begins to grow and implemented in 394 villages with 219 homestay coordinators and by 2019, Malaysia has 5956 rooms to accommodate tourists visiting tourist attractions in rural village side. The main objective of the programme is to generate employment opportunities to local community people and there by generating income to the homestay operators. This research study made an attempt to find out the profile of the homestay operators, operators' perception on social impact of homestay, facilities and services provided at homestay and role and responsibility of the tourism department to enhance the business. Based on the findings of the research, suggestions are provided for the better development of homestay business in rural regions of Malaysia. By implementing the suggestions provided in the research, the economic benefit of the rural areas will be improved.

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DEVELOPMENT OF SEED INDUSTRY IN INDIA: CHALLENGES AND OPPORTUNITY

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ABSTRACT

The Indian Seed Improvement Programme is backed up by a strong crop improvement programme in both the public and private sectors. At the moment, the industry is highly vibrant and energetic and is well recognized in the international seed arena. Several developing and neighbouring countries have benefited from quality seed imports from India. India's Seed Programme has a strong seed production base in terms of diverse and ideal agro-climates spread through out the country for producing high quality seeds of several tropical, temperate and sub-tropical plant varieties in enough quantities at competitive prices. Over the years, several seed crop zones have evolved with extreme levels of specialization. As a result, farmer has a wide product choice and seed industry today is set to work with a 'farmer centric' approach and is market driven. However, there is an urgent need for the State Seed Corporations also to transform themselves in tune with the industry in terms of infrastructure, technologies, approach and the management culture to be able to survive in the competitive market and to enhance their contribution in the national endeavour of increasing food production to attain food & nutritional security. The Indian seed industry is the fifth largest seed market in the world and valued at more than Rs 2500 crores. The seed industry has grown steadily in the last four decades. A number of transformations have taken place in this sector over the past few decades like rising a penetration of the organised sector, growth in contract farming, agriculture becoming more mechanized, easy loan facilities, rise of exports, use of agrochemicals and high yielding seeds and an increasing role of the private sector in processing, brandingand marketing, etc. Government took many progressive and reformative steps in last three decades for the growth of seed sector in the country. In terms of global trade, India is almost self-sufficient in flower, fruits and vegetables and field crops seeds.
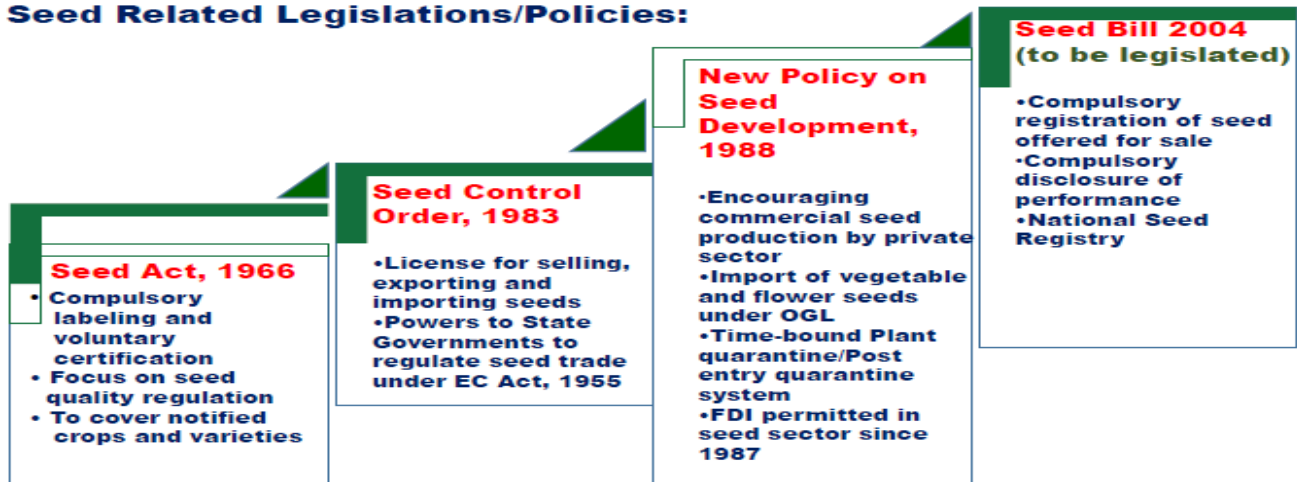
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Keywords: Indian Seed Industry, Seed Production, Seed Certification, Seed policy.

Introduction

Seed is the basic and most critical input for sustainable agriculture. The response of all other inputs depends on quality of seeds to a large extent. It is estimated that the direct contribution of quality seed alone to the total production is about 15 – 20% depending upon the crop and it can be further raised up to 45% with efficient management of other inputs. The developments in the seed industry in India, particularly in the last 30 years, are very significant. A major re-structuring of the seed industry by Government of India through the National Seed Project Phase-I (1977-78), Phase-II (1978-79) and Phase-III (1990-1991), was carried out, which strengthened the seed infrastructure that was most needed and relevant around those times. This could be termed as a first turning point in shaping of an organized seed industry. Introduction of New Seed Development Policy (1988 – 1989) was yet another significant mile stone in the Indian Seed Industry, which transformed the very

character of the seed industry. The policy gave access to Indian farmers of the best of seed and planting material available anywhere on the world. A number of transformations have taken place in this sector over the past few decades like rising a penetration of the organised sector, growth in contract farming, agriculture becoming more mechanized, easy loan facilities, rise of exports, use of agrochemicals and high yielding seeds and an increasing role of the private sector in processing, branding and marketing, etc. The agricultural sector is highly dependent on the availability and quality of seeds for a productive harvest. Therefore, in order to increase the quantity and quality of produce, efforts are made to introduce enhanced varieties of seeds with the help of advance technology and modern agricultural methods. In March 2002 the first transgenic hybrid cotton seed was allowed for commercial cultivation in the farmer's field.

Seed Policies and Regulation

Seed Related Legislations/Policies:

Seed Act, 1966
- Compulsory labeling and voluntary certification
- Focus on seed quality regulation
- To cover notified crops and varieties

Seed Control Order, 1983
- License for selling, exporting and importing seeds
- Powers to State Governments to regulate seed trade under EC Act, 1955

New Policy on Seed Development, 1988
- Encouraging commercial seed production by private sector
- Import of vegetable and flower seeds under OGL
- Time-bound Plant quarantine/Post entry quarantine system
- FDI permitted in seed sector since 1987

Seed Bill 2004 (to be legislated)
- Compulsory registration of seed offered for sale
- Compulsory disclosure of performance
- National Seed Registry

National Commission on Agriculture (1972) - Role of private seed sector

The government regulates the seed industry and the seed trade in various respects. The Seed Act of 1966, the Seeds Control Order of 1983, and the Seeds Policy of 1988 are the major components of policy specific to the industry. The seed industry has also been subject to policies relating to industrial licensing and direct foreign investment that are applicable to all industry. There have been two recent developments. In September 2001, the Plant Variety Protection and Farmer's Rights Act came into being. In June 2002, the government announced a new seeds policy that significantly alters the framework of regulation.

Policy Initiatives in Seed Sector

The following policy initiatives have been taken by the Government of India in seed sector:-
- Enactment of the Seeds Act, 1966
- Seed Review Team-SRT (1968)
- National Commission on Agriculture's Seed Group (1972)
- Launching of the World Bank aided National Seeds Programme (1975-85) in three phases

leading to the creation of State Seeds Corporations, State Seed Certification Agencies,

State Seed Testing Laboratories, Breeder Seed Programmes etc
- Seed Control Order (1983)
- Creation of the Technology Mission on Oilseeds & Pulses (TMOP) in 1986 now called The

Integrated Scheme of Oilseeds, Pulses, Oil Palm and Maize (ISOPOM).
- Production and Distribution Subsidy

- Distribution of Seed Mini-kits
- Seed Transport Subsidy Scheme (1987)
- New Policy on Seed Development (1988)
- Seed Bank Scheme (2000)
- National Seeds Policy (2002)
- The Seeds Bill (2004)
- Formulation of National Seed Plan (2005)
- National Food Security Mission (2007)
- Rashtriya Krishi Vikas Yojna (2007)

National Seeds Policy, 2002: Thrust Areas

- variety development
- plant variety protection
- seed production
- quality assurance
- seed distribution and marketing
- infrastructure facilities
- transgenic plant varieties
- import of seeds and planting materials
- seed exports
- promotion of domestic private sector seed industry
- strengthening of the monitoring system

Seeds Bill, 2004: Salient Features

Registration of kinds and varieties of Seeds etc.
- Evaluation of performance
- Compensation to Framers
- Registration of Seed Producers and Processing Units
- Seed dealers to be Registered
- Regulation of Sale of Seed and Seed Certification
- Seed Analysis and Seed Testing
- Export and Import of Seeds and Planting Material
- Offences and Punishment.

Major seed producing states are depicted in the following map

Market Structure and Regulation

In the global seed industry, the seed business is usually a part of a larger agricultural business consisting most often of agro-chemicals. In the last decade or so, there was a further wave of consolidation involving pharmaceutical and agricultural businesses. However, in recent years, this trend has weakened and even reversed as these life sciences firms have spun off their agricultural business primarily because investors perceived the earnings from agriculture to be more volatile on account of the controversies over GMO food. Monsanto (which has acquired DeKalb Plant Genetics, the international seed business of Cargill and Plant Breeding International and many other smaller firms), Aventis Crop Science (now taken over by Bayer), Syngenta (the agriculture arm of the merger between Novartis and AstraZeneca), Dow Agro Sciences (which acquired Cargill Hybrids) and DuPont (which acquired PioneerHiBred) are some of major input supplying agricultural businesses today.
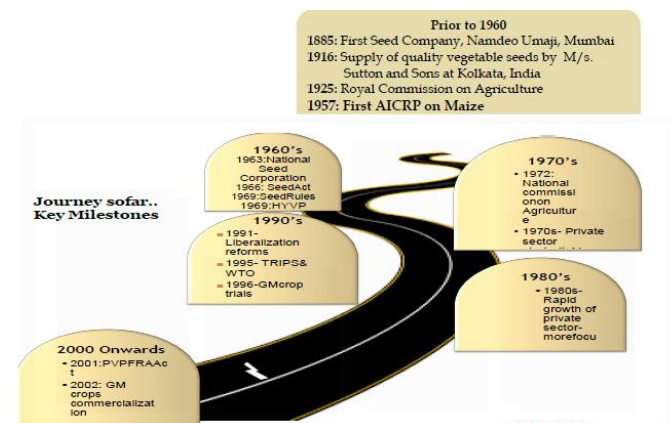
The consolidation in the global seed industry is attributed to the rising cost of research, the patenting of life forms and the scramble to control access to elite germplasm. The impact of these changes in India has so far been limited to changes in ownership rather than a dramatic reduction in seed companies. But they have raised fears of corporate control of agriculture. In the United States, corporate control is seen to be most prominent in the livestock sectors where producers are contractually tied to agri-businesses in the supply of inputs as well as in marketing.

It is not clear whether smallholder agriculture offers greater or lesser opportunities for corporate control. As issues of market structure have traditionally been analyzed by looking at the market shares of the leading seed firms, there has not been much research on the market structure at the micro level. How do firms compete at the retail level? What choices do farmers exercise.

According to Shiva and Crompton (1998), the marketing strategies of seed firms aim at persuading farmers to switch to hybrids from open-pollinated varieties. Some of these strategies are organization of field days and demonstration plots, using field assistants to visit farmers, farmer advocacy by the selection of model farmers, customer contact programmes, free distribution of farmer's handbook and free distribution of small packets of seeds. Yet, the same study points out, the hybrid seed market is fickle and farmers' preferences for particular brands of seed change rapidly reflecting the specific marketing success of individual company. This suggests that seed firms in India have not yet built successful brands that could be leveraged into some degree of monopoly power.

At the same time, it has also been observed that public hybrids sold under private brand names are sometimes sold at premiums reflecting the farmers' perceptions of quality. Tripp and Pal (2000) studied the information flow between seed firms and farmers in the pearl millet market of eastern Rajasthan. They found that even in areas where the use of private hybrids is extensive, while farmers can recall the brand or the company that produced their seed they cannot often distinguish between a company's hybrids. This is possibly because companies invest resources in advertising company brands rather than in communicating information about the varieties. As established seed companies have reputations to protect, branding is a convenient short-cut for communicating product quality. Branding is also an entry barrier to small and new firms that cannot afford advertising or do not have past reputations to build on. Ideally, seed certification should provide the route for small firms to convey signals about their product quality. However, Tripp and Pal find that such information is not used by farmers. The farmers in the survey could not explain the difference between certified and truthfully labeled seed. Thus, in the absence of farmer education, quality regulation fails to protect farmers and neither does it reduce barriers to entry that are created by branding.
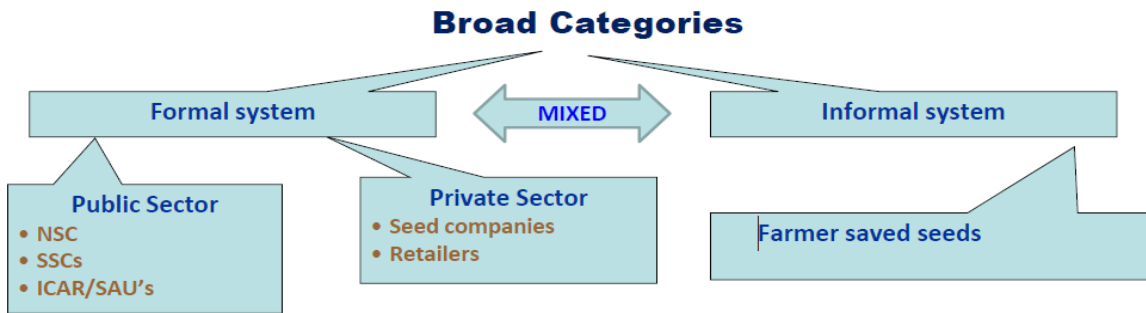
Role of Public & Private Seed Sector

The private sector has started to play a significant role in the seed industry over the last few years. At present, the number of companies engaged in seed production or seed trade is of the order of 400 or 500. However, the main focus of private seed companies has been on the high value low volume seeds and market for low value high volume seeds seeds of cereals, pulses and oilseeds is still dominated by the public sector seed corporations. Private sector companies have a significant place mainly in the case of maize and sunflower and cotton. However, in the case of vegetable seeds and planting materials of horticultural crops, the private sector is the dominant player. As the private sector has not been enthusiastic about entering into seed production of high volume low margin crops of wheat, paddy, other cereals, oilseeds and pulses, the public sector seed corporations will continue to remain dominant in cereals, pulses and oilseeds for many more years to come. At present 15 State Seeds Corporation and 2 National level seeds Corporations (National Seeds Corporation of India & State Farms Corporation of India) are functioning in the country. Besides, significant quantities of seeds are also produced by the State Departments of Agriculture, where the State Seeds corporations are not in existence. The contribution of private
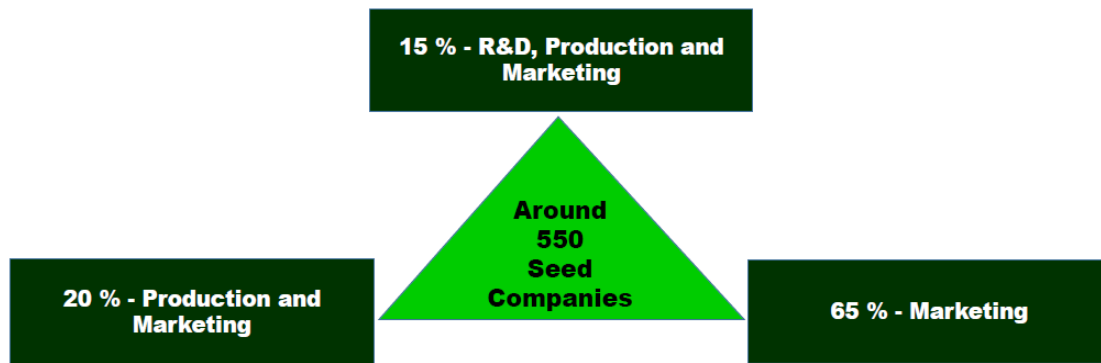
sector seed companies in total seed production   of the country.

Indian Seed System

Broad Categories

Formal system — MIXED — Informal system

Public Sector
- NSC
- SSCs
- ICAR/SAU's

Private Sector
- Seed companies
- Retailers

Farmer saved seeds

Private Seed Sector in India

15 % - R&D, Production and Marketing

Around 550 Seed Companies
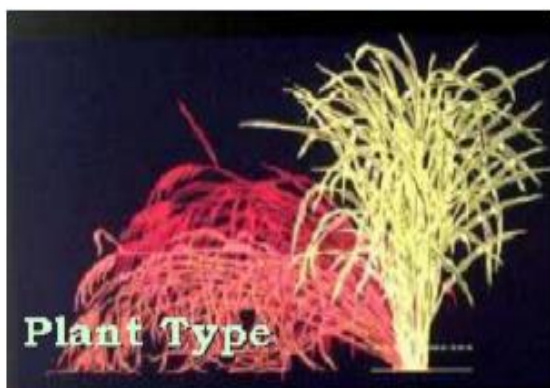
20 % - Production and Marketing

65 % - Marketing

Impact of Green Revolution

Impact of Green Revolution

- Five & half fold increase in food grains
  (50mt – 284.8 mt in 2018)
- As against four fold increase in population
  (from 0.3 – 1.34 Billion)
- Reduced poverty (From 70% - 20%)
- Buffer stock : > 46 mt ; Export : around 20 mt
- Life expectancy almost doubled
  (From 32 - 68 years)

Green Revolution was Seed Led

Need for a second Green Revolution

The Green Revolution ushered during the late 60s and 70s is recognized to be a turning point in our Indian Agriculture.

It is well known that the introduction of high yielding, semidwarf and fertilizer responsive varieties of wheat and rice led to a dramatic shift from food scarce to "food secure" status in the country. This success was the result of holy alliance between policy makers/administrators and the hard working farmers. In order to meet the growing demands for our increasing population, likely to be 1.7 billion by 2050, we shall need to double our food production (Paroda, 2013) [13]. This can only be possible by bridging the existing yield gaps through improved productivity and by integrated natural resource management. Hence, the second Green Revolution would demand much faster growth of seed sector especially to meet the demand of hybrid seeds and to replace old with new high yielding varieties. For this, a Mission on Seed Production is urgently needed.

Opportunities for seed sector

The nature gifted biodiversity and the diversity in agro-climatic conditions offer exciting opportunities for India to be globally competitive in producing and promoting a number of seed crops for export. We must be proactive to explore export potential and create enabling environment. This can be achieved through a well planned strategy and targeted implementation plan. Future growth drivers of seed industry could be hybrids in crops viz. paddy, maize, mustard, pigeonpea followed by vegetables and flowers. India is a major player in the global paddy market with about 43.0 million ha cropped area. Although having largest acreage under paddy cultivation, productivity is stagnant at about 3.5 t/ha. Hybrid rice could be a game changer for India, as only 4.1 % of area is under hybrid rice. Total paddy seed turnover is Rs. 21.8 billion in 2011. It could be increased to Rs. 42 billion over the next four years, if 50 % of the cultivated area is covered by improved varieties and 10 % by hybrids (ISTA News, 2012). Over the past few years, world demand for maize is increasing due to its alternative usages like biodiesel

production. Globally, India ranks 4th in production as well as acreage with average productivity of 2.5 t/ha. In future, global warming is likely to have detrimental effect on wheat and rice cultivation, under such situation, maize, a C4 Plant may play decisive role in mitigating harmful impact of climate change. Therefore, focus on quality seeds of hybrid maize will largely contribute to growth of Indian seed market in near future. Technological breakthroughs in relevant fields of seed science and technology are quite commendable both at national as well as international domain. Seed testing and quality assurance is one area where lots of policy, infrastructure and human resource support is needed. Establishing world class facilities for seed testing, certification and to match requisites of international conventions viz., UPOV, ISTA etc., so that seed from India can carve its niche in international trade. Even though, India is fifth in position in terms of value share, there is ample scope to amend the figure mentioned and for excelling in international seed trade. India with diverse agro-climatic zones, unlimited options for crops and probably with largest research man power has an enormous opportunity to stamp authority on world seed front. Expanding the know-how of conventional seed science and technology viz., floral biology, pollination, seed development, maturation and seed production technology per se can create formidable opportunities in maximizing the productivity levels thereby food and socio-economic security in the country. Regarding seed quality enhancement, whole spectrums of opportunities are awaiting. Second and third generation seed quality enhancement strategies will play a vital role in giving an altogether new dimension to seed. Seed designing will emerge as a futuristic technology, where seeds are fabricated with all necessary additives that give adequate planting value across diverse agro-climatic zones by insulating them against biotic and abiotic stresses. A new era of seed designing is going to be unraveled in near future, where seeds are bought or sold on number basis making it as the most precious input of cropping system (Vision 2050, 2015).

Opportunities under Seed Quality Augmentation

Deployment of intelimer additives for coating/ pelleting of seed, Utilization of advanced polymer systems (thermo/hydro) for seed designing , Smart delivery systems (nanotechnology) for controlled release of analytes , State of art disinfection techniques (thermo/ plasma treatments) for seed protection, Deployment of OMICS technologies in seed quality improvement, Development of Image Analysis Systems for seed & seedlings quality assurance are a few techniques worth mentioning.

Prospects of seed export

India's share in global seed exports is about 0.6 % (ISF, 2012). To give a boost to seed export,
India decided to participate in OECD Seed Schemes in five categories viz., Grasses and legumes;
Crucifers and other oil or fibre species; Cereals; Maize, sorghum and Vegetables. OECD Seed
Schemes is one of the international frameworks available for certification of agricultural seeds moving in international trade. Its objective is to encourage use of seeds of consistently high quality in participating countries. Complying to internationally acceptable procedures of seed quality assurance shall certainly boost our seed exports and enable India a force to reckon with in global seed realm (Vision 2050, 2015).

Opportunities for production of high quality seed

Seed Production Research

Future of agricultural production will largely depend upon development of improved varieties/ hybrids in various crops, supported by efficient, cost effective seed production technologies. Diversification of areas for seed production and development of appropriate seed production technology needs to be focused for expansion of seed production system in the country. Identification of alternative/specific areas for quality seed production and mapping of disease free seed production zones may go a long way in popularizing seed production technologies in nontraditional areas.

Climate Resilient Seed Production

The reproduction success in plants is determined largely by the environmental conditions prevailing during the growing season. Among the various environmental factors, moisture and temperature have direct influence on reproduction. Early reproductive processes like pollen viability, stigma receptivity, anthesis, pollination, fertilization, and early embryo development are all highly prone to moisture and/ or temperature stresses. Failure of any of these processes increases early embryo abortion, leading to poor seed set, thus limiting the seed yield. The physiological mechanisms of reproductive failure under stress are not well understood. Hence, considerable efforts should be made to study the effect of climate change on seed production of various crops to develop suitable crop management technologies and mitigate the adverse effects on the reproductive phase (Vision 2050, 2015).

Cold Plasma Coating

Seeds could be coated with different (hydrophobic/hydrophilic) gaseous polymers under high energy and low temperature. Under suchconditions the gases attain the plasma state and get coated on the seed surface. Application of this technology has been shown to control the speed of germination.

Molecular Impulse Response (MIR)

It is a non-chemical, energy-based enhancement, which is supposed to provide improved tolerance to different types of abiotic stress effects, often increasing germination, accelerating maturity, and raising yields. MIR uses an extremely low energy electron shower to create a short-term rise in free radical levels.

Inside the cells of seed. This causes the cells natural defense to produce more anti-oxidants, which disable the free radicals and leave the cell with less free radicles and more anti-oxidants than before the process began.

Bioprospecting

Application of biological agents to crop seeds have focused on root colonizing bacteria, termed rhizobacteria. PGPR (Plant Growth Promoting Rhizobacteria) comprise those rhizobacteria that includebeneficial effects on plants during colonization. Benefits of PGPR include promotion of plant growth and biological control of plant diseases. In addition to causing yield increase, often induce early season growth promotion that can be manifested in various forms, including enhanced seedling emergence,increased biomass of roots and/or foliage, and earlier flowering.

Nanotechnology for Seed Quality Enhancement

Seed treatment with carbon nano tubes (CNTs), array of nano particles (gold/silver/borates) is a whole new field, yet to be fully unraveled. Application of Nanotechnology in seed science research is still at nascent stage, and its full potential is yet to be tapped. Right from designing smart delivery systems (CNTs, nanofibres) loaded with nutrients/PGRs/pesticides for sustained release, dormancy breakdown, longevity enhancement, vigor augmentation, physiological process regulation and molecular modification, that means it is a research realm with infinite boundaries and shall reorient the entire concept of seed enhancement.

Challenges for seed industry

On global front, population will breach 9 billion mark by 2050 with India leading the march, i.e. each farmer must feed more people with declining land and water resources. On the verge of climate change, seed research is the key to unlock the potential of technologies. In the Indian context, from a long period of time, seed requirement of farmers is mainly met by farm saved seed, i.e. still 65 % of thefarmers are using their own saved seed or seed distributed among them (Vision 2050, Directorate of seed Research). Making the quality seed available at right time is greater challenge rather than production per se. Seed, being the principal input in determining productivity, seed replacement should be given utmost priority. Amelioration of skewed SRR, i.e. the percentage of area sown out of total cropped area by using certified/quality seeds other than farm saved seed is the major challenge (Table 1).

Table-1

| Crop	National Highest SRR (%)	Lowest SRR (%)		Average SRR (%)	
Bajra	61.4	100.0	Gujarat	29.0	Karnataka
Paddy	37.5	82.0	Andhra Pradesh	9.0	Uttarakhand
Jowar	25.9	65.0	Andhra Pradesh	11.0	Tamil Nadu
Maize	54.1	100.0	Karnataka	5.0	Odisha
Wheat	32.6	42.0	Maharashtra	11.0	Jammu & Kashmir
Bengal gram	18.4	78.0	Andhra Pradesh	4.0	Rajasthan
Sunflower	61.2	100.0	Andhra Pradesh	8.0	Madhya Pradesh
Mustard	63.6	78.0	Odisha	13.0	Odisha
Cotton	10.4	100.0	Andhra Pradesh	2.0	Odisha
Soybean	35.9	3100.0	Andhra Pradesh	11.0	Rajasthan
Groundnut	24.5	50.0	Andhra Pradesh	0.5	Madhya Pradesh
Blackgram	18.4	78.0	Andhra Pradesh	4.0	Rajasthan
Redgram	17.5	55.0	Andhra Pradesh	2.0	Odisha
Blackgram	29.2	77.0	Haryana	3.0	Chattisgarh

Source: **Directorate of Economics & Statistics, Ministry of Agriculture, GOI {2012} (http://dacnet.nic.in/eands)**

Increasing Seed Replacement Rates in Critical Crops

The growth of the seed industry in any country is dependent on how often farmers are replacing their seeds. The seed replacement rates for almost all the crops in India have considerably improved in the recent times. Over a ten-year period, from 2002 to 2012, the seed replacement rates of key cereal crops have more than doubled, with that of rice experiencing a 111% jump, wheat increasing by 154%, and maize 238%. Increasing seed replacement rates are a result of increased farmer extension and marketing activities of seed companies, as well as the general perception among farmers about yield improvements that can be achieved through replacement of seeds every year. Even though

there is slight improvement recently, still a long way ahead in making the quality seed available at farmers' doorsteps and for achieving 100% SRR, which will herald the growth driven by quality seed in agriculture sector. Another major problem of seed chain is Varietal Replacement Rate (VRR). Even though with more than 4500 varieties, notified and available, indents for basic seed and its further multiplication is restricted to a few varieties. Many improved varieties, which are location specific, resistant to biotic and abiotic stresses never saw the light of the day, may be due to below par extension activities. Hence special focus need to be given on improvement of VRR, which certainly paves the way for improved productivity levels manifested in the form of increased production. Regarding seed
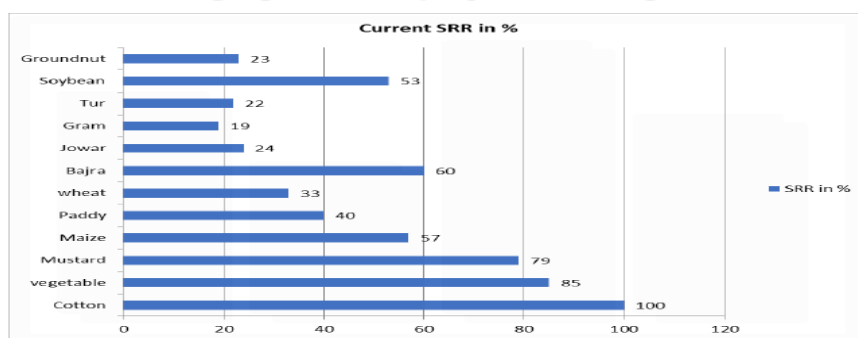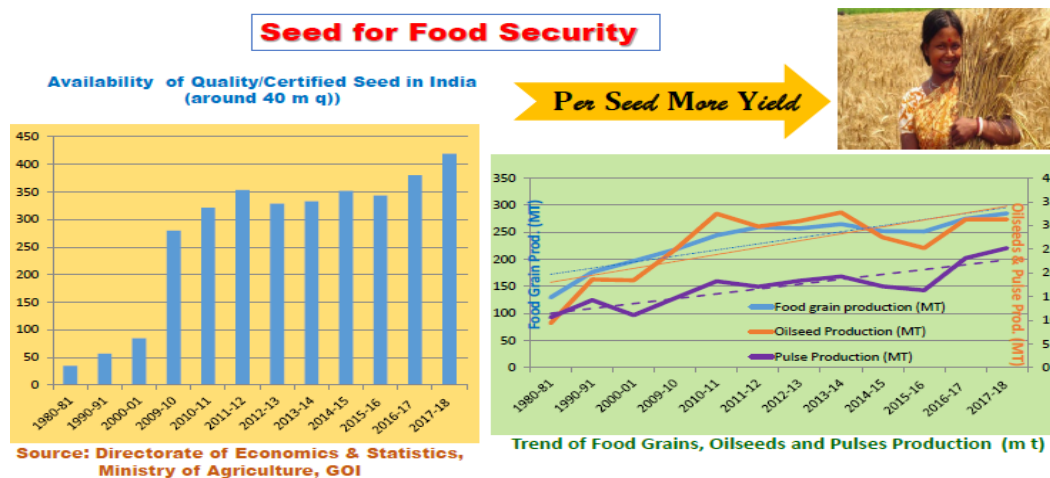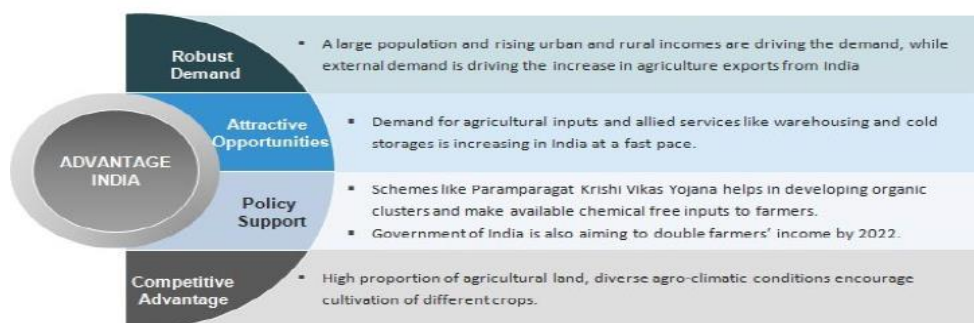

Fig.6 : Global Seed trade

technological research, emphasis has to be given on basic research relevant to floral biology, pollination,seed development and maturation studies in a bid to attain better seed recovery.

Seed for Food Security

Availability of Quality/Certified Seed in India (around 40 m q))

Per Seed More Yield

Source: Directorate of Economics & Statistics, Ministry of Agriculture, GOI

Trend of Food Grains, Oilseeds and Pulses Production (m t)

Why to Invest in India?

ADVANTAGE INDIA

Robust Demand — A large population and rising urban and rural incomes are driving the demand, while external demand is driving the increase in agriculture exports from India

Attractive Opportunities — Demand for agricultural inputs and allied services like warehousing and cold storages is increasing in India at a fast pace.

Policy Support — Schemes like Paramparagat Krishi Vikas Yojana helps in developing organic clusters and make available chemical free inputs to farmers.
— Government of India is also aiming to double farmers' income by 2022.

Competitive Advantage — High proportion of agricultural land, diverse agro-climatic conditions encourage cultivation of different crops.

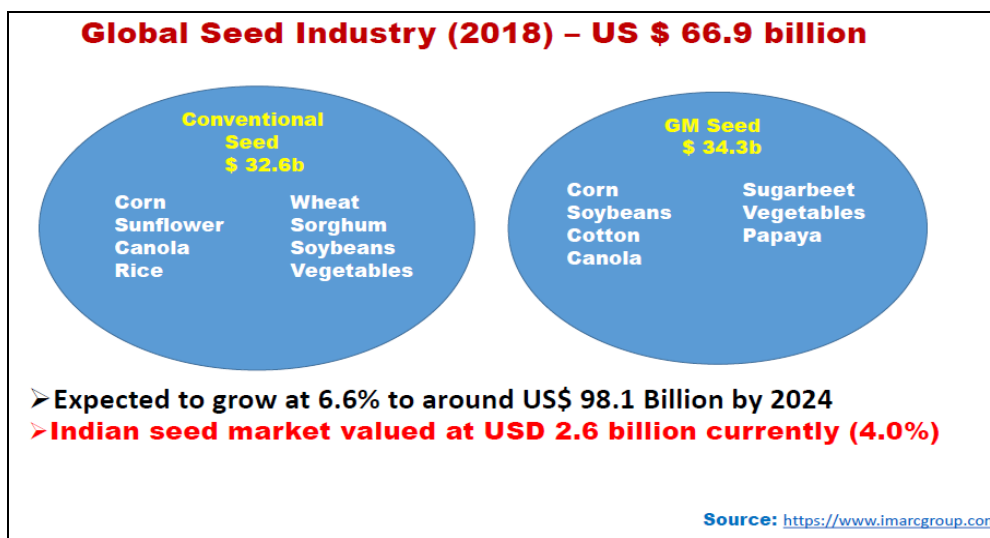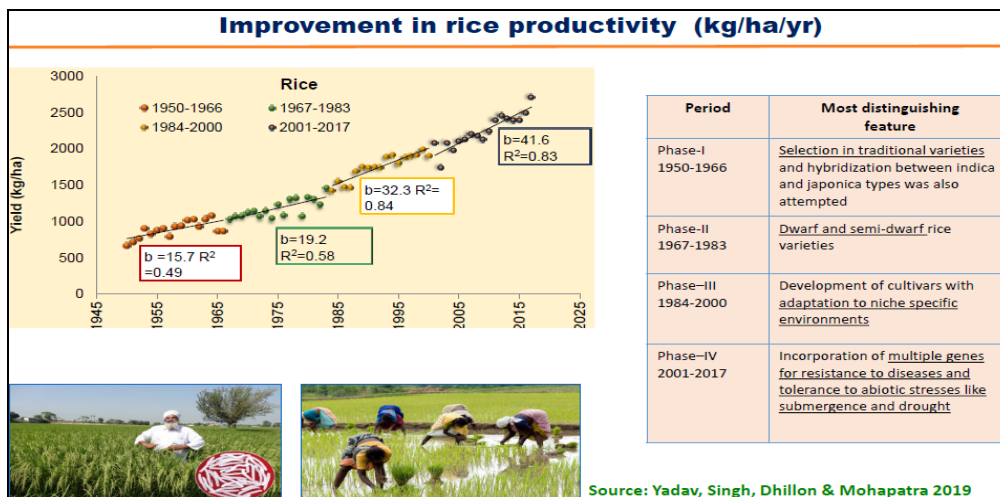Source: https://www.ibef.org/industry/agriculture-india.aspx

Indian Seed Market

- **Fast growth rate over two decades : 10-14 %**
- **Current Value   - US $ 2.6 billion**
- **Expected by 2020 - US $ 3.0 billion**
- **Expected by 2030 - US $ 5.0 billion**

Crop wise Seed Market in India

Crop	Market 2018 (Rs Cr)	Estimated Market 2022 (Rs Cr)	CAGR	Key Players
Vegetables	4500	6300	8%	BASF, Seminis, Syngenta, Mahyco, VNR, Namdhari, Indo American, Accen HyVeg, Advanta
Cotton	3000	3500	6%	Rasi, Kaveri, Nuziveedu, Mahyco, Ajit, Shriram Bioseed, Ankur, Seedworks, Tierra, Metahelix
Maize	2400	3100	10%	Corteva, Bayer Monsanto, Syngenta, Shriram Bioseed, Kaveri, Limagrain, Rasi
Rice	2200	2900	8%	Bayer Monsanto, Corteva, VNR, Mahyco, Syngenta, Savannah, Metahelix, Rasi
Others	5900	9200	9%	Advanta, Crystal, Corteva, Bayer Monsanto, Metahelix
Total	18000	25000	10%	

Improvement in rice productivity (kg/ha/yr)

Period	Most distinguishing feature
Phase-I 1950-1966	Selection in traditional varieties and hybridization between indica and japonica types was also attempted
Phase-II 1967-1983	Dwarf and semi-dwarf rice varieties
Phase–III 1984-2000	Development of cultivars with adaptation to niche specific environments
Phase–IV 2001-2017	Incorporation of multiple genes for resistance to diseases and tolerance to abiotic stresses like submergence and drought

Source: Yadav, Singh, Dhillon & Mohapatra 2019

Global Seed Industry (2018) – US $ 66.9 billion

Conventional Seed $ 32.6b

Corn   Wheat
Sunflower Sorghum
Canola   Soybeans
Rice   Vegetables

GM Seed $ 34.3b

Corn   Sugarbeet
Soybeans   Vegetables
Cotton   Papaya
Canola

➤ Expected to grow at 6.6% to around US$ 98.1 Billion by 2024
➤ Indian seed market valued at USD 2.6 billion currently (4.0%)

Source: https://www.imarcgroup.com

Conclusions

Like many countries, India has invested considerable resources in public sector agricultural research. Within this framework, the focus has been in generating, testing and diffusing relevant technologies. The public sector driven picture of agricultural research has, however, been changing. Because of new technologies and stronger intellectual property rights, innovators can now appropriate a significant enough share of the gains from research. This has transformed the seed industry as the private sector has grown to be a sizeable presence in many crops. As the payoff to research and higher agricultural productivity is high in poor countries, the investment of private capital in agricultural research contributes to economic development.

The appropriability of research gains is made possible by monopoly power in the hands of seed suppliers. This paper has pointed out some of the research challenges that are posed by non-competitive market structures. However, there are other issues as well. The growth of private seed industry has occurred in the context of global capital flows, the agreements on intellectual property rights and patents at the WTO and continuing applications of biotechnology to crops and livestock. NGOs and in particular, environmentalists have strong misgivings about the impact of these developments on bio-diversity and low input agriculture is cited by them as the only sustainable form of agricultural development. For economists, it is often not clear what is objected to: market forces, trans-national companies, monopolies, patents or bio-technology itself. Therefore, as a research strategy, this paper has focused on challenges posed by non-competitive market structures. However, it should be clear this is only a small part of the work that is necessary to advance our understanding of the place of seed industry in today's world.

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A MODIFIED FUZZY TOPSIS MATHEMATICAL MODEL FOR HOME PURCHASING: AN EMPIRICAL APPLICATION IN SURAT CITY

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ABSTRACT

Everyone, irrespective of class, cast or societal strata wants to but the best product which is the value for the money spent. The 'best' indicates to its criteria including cost, quality, durability, performance and so on in accord with a buyer's choice. The buying behaviour of the consumer depends on the multi criteria decision making which in turn has myriad approaches amidst which The Technique for Order Preference by Similarity Ideal Solution (TOPSIS) is the most noteworthy. In the same context, the present study focuses on the implementation of Fuzzy TOPSIS technique for decision making problems in the case of vague information. With the usage of Fuzzy TOPSIS method, an algorithm is projected to ascertain the most appropriate selection of the home with plausible characteristics. The method is exemplified by way of the instance of buying dream home.

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Keywords: Purchasing,Multi Criteria Decision Making, Fuzzy TOPSIS.

Introduction

The word 'home' is used to denote 'a place where a an individual or a family resides in, temporarily or permanently. It can be anything inside the four walls beginning from a cave, a hut, a bungalow, a raw-house, an apartment, a building, a sky scrapper or a mobile home, a houseboat, yacht or anything which provide a shelter. It facilitates a place involving all the human activities, either it can be sleeping or cooking or many more. A homestead comprises of farming activities and provides amenities for animals. In the other sense it can also be termed a geographical range, i.e. a village, a town, a district, a city, or a country. Buying a dream home which is decent, cosy, a safe pinned by everyone and the most vital in life.
"The Most important work you will be within the walls of your own house"

    (Harold B. Lee, American Educator and Leader, 1970)

Buying the finest home, where manifold features, standards and selections are offered and hence, certain standards bear an effect on buying behaviour of an individual, such as time of life pf the property minimum 0-1-year-old. The building type of home are mostly apartment or independent home and suburban home having 3BHK. The price of the home is around 0-1 crore having area of approximately 0-2000 sq. ft. Likewise, a home selection has also the component of choice like master bedroom, gallery, water, car parks, elevator, security, gate, electricity power back up, *vaastu* etc. The distance from the places of daily and emergency access like hospital, rail-way, airport, garden, school, petrol-pump, market, bank, mall, police station etc. are also vital for the buying statistics for a home. Hence, this research is necessary to determine a means to choose the best home with several criteria.

Literature Reviews

H. Bustince at.al [1995] have described handling multi criteria decision making problems based on intuitionistic fuzzy set. They presented a new score function in order to gauge the degree of suitability of the selection of a certain alternative [8]. Rita Almeida Ribeiro [1996] gave a Review and New Preference Elicitation Techniques of fuzzy Multiple Attribute Decision Making. [10].Stelios Zanakis et-al. [1998] presented a simulation comparison of select methods of Multi-attributes decision making. [11].. Behnam Vahdani et-al. [2011] applied a group decision making method based on new-fangled fuzzy modified TOPSIS method for manufacturing decisions with two examples for the robot selection and rapid prototyping process selection [4]. Maysam Ashrafzadeh et-al [2012] gave a case study about the appliance of fuzzy TOPSIS technique for choosing a Warehouse Location. This study is a multi-criteria selection problem comprising

quantitative and qualitative standards and features a tactical prominence for several companies [9]. Balaram dey et-al. [2016] used fuzzy multi criteria choice making practices based on subjective and objective criteria for warehouse location selection which are accomplished by the operating particular and neutral aspects for the assessment and choice of warehouse site[2].Devie Rosa Anamisa et-al. [2016] have proposed selection system of the boarding house based on fuzzy multi attribute decision making method. [6]. Geovanna Villacreses et-al. [2017] proposed wind farms significance location selection problem using geographical data system based on multi-criteriadecision makingapproaches. [7]. Balwinder sodhi et-al. [2017] presented a simplified description of Fuzzy TOPSIS and used TOPSIS in one example scenario of a MCDM for laptop to purchase by a group of two person to determined which laptop is good to buy. [3]. Chin-Nan Wang et-al. [2019] proposed a MCDM model for supportable supplier evaluation and selection based on triple bottommost line approaches within the apparel industry[5]. Atef M.Ghaleb, et-al. [2020] presented calculation and comparison of various MCDM approaches in the selection of producing process. In this the result is that the TOPSIS and VIKOR approaches were batter suitable for manufacturing process selectionproblems[1].

Home purchasing problem and multi-criteria decision-making approach

Any person can purchase best home from the set of desirable alternatives using various mathematical and statistical methods such as Multivariable Analysis, Operation Research (OR), Fuzzy Mathematical Modelling (FMM), Fuzzy Neuro system (FNS), Genetic Algorithm (GA), Fuzzy Genetic Algorithm (FGA), Multi Criteria Decision Making (MCDM) etc. Research can use any one these methods for the selecting the best home or purchasing the best product from the set of desirable alternatives.

Home purchasing problem is considered as a Multi Criteria Decision Making (MCDM). MCDM is one of the most recognizedtechniquesfor decision making problem. MCDM method is known for decision making, associated with multiple criteria or goals. MCDM works with the problem of selecting an option from a set of alternatives which are considered in terms of their attributes. In a MCDM method rating and weights are assumed. MCDM is used for screening, priorating, rating and selecting a set of alternatives under associated attributes or criteria. There are many MCDM methods. Each method has itsindividual characteristic. In a MCDM, the methods are Analytical Hierarchy Process (AHP), Techniques for Order Preference by Similarity to Ideal Solution (TOPSIS), Elimination and choice expressing the reality (ELECTRE), Weighted Sum Model (WSM), Weighted Product Model (WPM), revised AHP, etc. [1]. There are many researchers who worked for purchasing problems using MCDM which are discussed in section 2.

Proposed modified FTOPSIS model

The algorithm steps for proposed modified fuzzy TOPSIS are as follows:

Step 1: Identification of required criteria, alternatives and decision makers

Let A_i be a finite set of m alternatives which are to be evaluated based on criteria C_j be a set of n alternatives and DM_k be a set of p decision maker where,

$$i = 1,2,\ldots,m \quad, \quad j = 1,2,\ldots,n \quad,$$
$$k = 1,2,\ldots,p$$

Step 2: Define the linguistic variables

In this step defining the appropriate linguistic variables for applicable membership functions will be done.

Step 3: Construct the performance fuzzy rating matrix

Let DM be the decision maker. The fuzzy rating of the kth decision maker, about the ith alternative on j^{th} criterion are given as:

$x_{ij}^k = \left(a_{ij}^k, b_{ij}^k, c_{ij}^k\right)$, where $i = 1,2, \dots, m$ and $j = 1,2, \dots, n$, then the fuzzy ratings x_{ij} of alternatives with respect to each criteria are given by $x_{ij} = \left(a_{ij}, b_{ij}, c_{ij}\right)$ such that:

$$a_{ij} = \min_k\{a_{ij}^k\},$$

$$b_{ij} = \frac{1}{K}\sum_{k=1}^K b_{ij}^k \quad c_{ij} = \max_k\{c_{ij}^k\} \qquad [1]$$

Step 4: Construct the important fuzzy weighted matrix

Let DM be the decision maker. If the fuzzy weight of the kth decision maker, about the ith alternative on j^{th} criterion, are:

$$w_{ij}^k = \left(a_j'^k, b_j'^k, c_j'^k\right),$$

where $i = 1,2, \dots, m$ and $j = 1,2, \dots, n$, then the fuzzy weights of each criteria are calculated as $w_j = (a_j', b_j', c_j')$ where,

$$a_j' = \min_k\{a_j'^k\} \quad b_j' = \frac{1}{K}\sum_{k=1}^K b_j'^k \quad c_j' = \max_k\{c_j'^k\} \quad [2]$$

Step 5: Construct the fuzzy decision matrix and aggregated fuzzy weighted matrix

A fuzzy MCDM problem which can be expressed in matrix format as,

$$D = \begin{matrix} & \begin{matrix} w_1 & w_2 & w_3 & w_4 \\ C_1 & C_2 & C_3 & C_4 \end{matrix} \\ \begin{matrix} A_1 \\ A_2 \\ \vdots \\ A_m \end{matrix} & \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix} \end{matrix} \quad [3]$$

$$W = [w_1, w_2, \dots, w_n] \qquad [4]$$

where $x_{ij} = (a_{ij}, b_{ij}, c_{ij})$ and $w_j = (a_j', b_j', c_j')$,$i = 1,2, \dots, n$, $j = 1,2, \dots, m$ are triangular fuzzy number representing linguistic variables.

Step 6: Construct the normalized decision matrix

The normalized fuzzy decision matrix can be expressed as follows:

$$R = [r_{ij}]_{m \times n}, i = 1,2, \dots, m ; j = 1,2, \dots, n \qquad [5]$$

where:

$$\left. \begin{aligned} r_{ij} &= \left(\frac{a_{ij}}{c_j^+}, \frac{b_{ij}}{c_j^+}, \frac{c_{ij}}{c_j^+}\right) & \text{and} \\ c_j^+ &= \max_i c_{ij} & \text{(benefit criteria)} \end{aligned} \right\} \quad [6]$$

$$\left. \begin{aligned} r_{ij} &= \left(\frac{a_j^-}{c_{ij}}, \frac{a_j^-}{b_{ij}}, \frac{a_j^-}{a_{ij}}\right) & \text{and} \\ a_j^- &= \min_i a_{ij} & \text{(cost criteria)} \end{aligned} \right\} \quad [7]$$

Step 7: Construct weighted normalized decision matrix

Here V is a weighted normalized fuzzy decision matrix which is calculated by multiplying the weights (w_j) of evaluation criteria with the normalized fuzzy decision matrix r_{ij} as:

$$\left. \begin{aligned} V &= [v_{ij}]_{m \times n} \\ where: i &= 1,2, \dots, m; \; j = 1,2, \dots, n \\ v_{ij} &= r_{ij}(\cdot)w_{ij} = (a_{ij}'', b_{ij}'', c_{ij}'') \end{aligned} \right\} \quad [8]$$

Step 8: Calculate the fuzzy positive ideal solution (FPIS) and fuzzy negative ideal solution (FNIS)

The FPIS and FNIS of the alternatives are defined as:

$$\left. \begin{aligned} A^+ &= (v_1^+, v_2^+, \dots, v_n^+) \\ where: v_j^+ &= (c, c, c) \\ such \, that: c &= \max_i\{c_{ij}''\}, i = 1,2, \dots, m, j = 1,2, \dots, n \end{aligned} \right\} \quad [9]$$

$$\left. \begin{aligned} A^- &= (v_1^-, v_2^-, \dots, v_n^-) \\ where: v_j^- &= (a, a, a) \\ such \, that: a &= \min_i\{a_{ij}''\}, i = 1,2, \dots, m, j = 1,2, \dots, n \end{aligned} \right\} \quad [10]$$

Step 9: Calculate the distance using vertex formula for each alternative from the FPIS and the FNIS

The distance of each alternative $i = 1,2, \dots, m$ from the FPIS and FNIS is calculated as follows:

$$d_i^+ = \sum_{j=1}^n d_v(v_{ij}, v_j^+), \qquad i = 1,2, \dots, m \quad [11]$$

$$d_i^- = \sum_{j=1}^n d_v(v_{ij}, v_j^-) \qquad i = 1,2, \dots, m \quad [12]$$

where $d_v(a, b)$ is the distance measurement between two fuzzy number A and B.

Step 10: Calculate the closeness coefficient

The closeness coefficient CC_i represent the distance to FPIS, A^+ and the FNIS, A^- simultaneously. The closeness coefficient of each alternative is calculated as:

$$CC_i = \frac{d_i^-}{d_i^- + d_i^+}, \; i = 1,2, \dots, m \qquad [13]$$
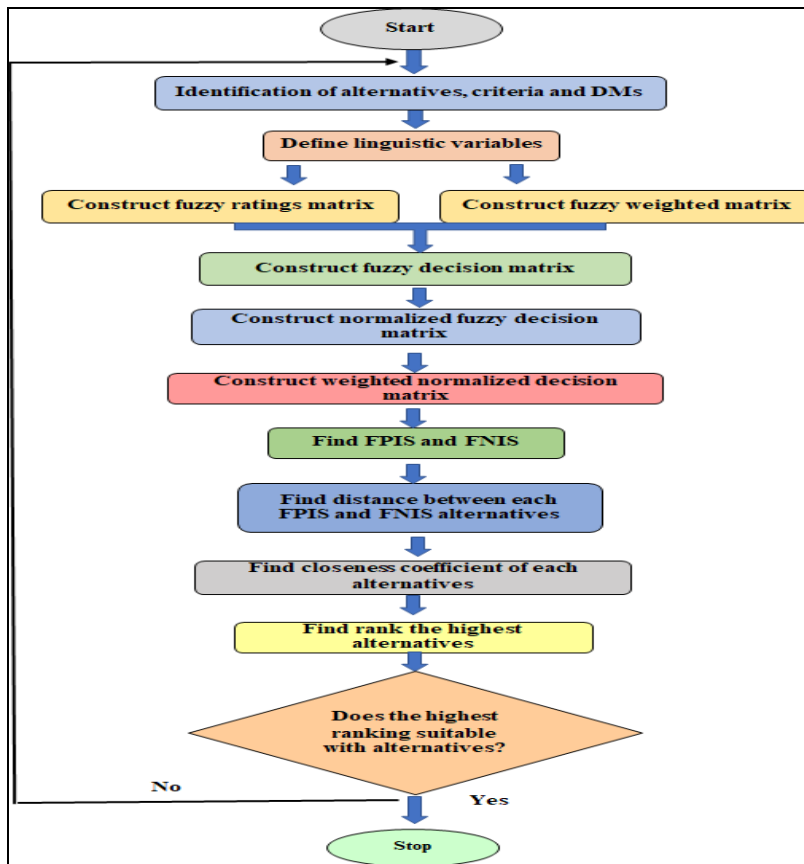
Step 11: Rank the alternative according to their relative closeness

The alternative with highest closeness coefficient represents the best alternative and is closest to the FPIS and farthest from the FNIS.

The workflow chart architecture of proposed modified FTOPSIS model is presented in figure

**Flow chart architecture of propod modified ftopsis model**

Figure 1: The flow chart architecture of proposed modified FTOPSIS mode

An Empirical Application

A numericalanalysis is illustrated and the collecting data from www.99acares.com is used for selecting best home at Surat, Gujarat, India location according to a decision maker. As the numerical example, five alternatives from Surat where one of the most preferred home places in Surat, are set and the different criteria used which are (i) cost,(ii) area, (iii) facility and (iv) location are assumed which associated to the selected home according to decision makers. A step by step discussion is given below:

A decision maker (DM) is presented with five choices of homes H_i $(i = 1,2,...,5)$ with respect to the different criteria. A DM needs to select one of the home so that can negotiate a price. The hierarchical structure of this problem is shown in figure 2.
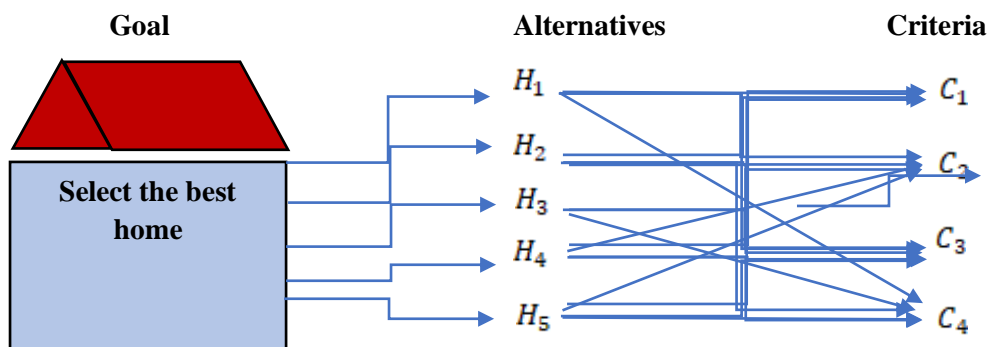
Figure 2: Alternatives and criteria for selecting best home

Here, the four criteria (i.e.) cost (C_1), area (C_2), facility (C_3) and location (C_4) are used for selection of a best home. The criteria and alternatives are taken online (from app 99acers.com). A decision maker uses the seven point scale linguistic variables whose values are given as triangular fuzzy number to express the importance weight/priority to four criteria.

In this the criteria like cost, area, facility, and location are used.

In this study, a decision making is needed to solve the problem using five alternatives (i.e. homes H_1, H_2, H_3, H_4, H_5) with the associated four criteria (i.e. C_1, C_2, C_3, C_4).

The five alternatives are shown in below table 1

Alternatives	Names of alternatives	Types of alternatives
H_1	Salaj homes, Adajan	Apartment
H_2	Rajdeep society, Dindoli	House villa
H_3	Hampton park, Vesu	Apartment
H_4	Prasiddhi apartment, Piplod	Apartment
H_5	Nr. McDonald's, Adajan	House villa

Table 1: Alternatives with name and asset type

The four-criterion associated to the alternatives are shown in below table 2:

Criteria	Alternatives	Details of alternatives
C_1 (Cost)	H_1	**40 lakhs**
	H_2	35 lakhs
	H_3	82 lakhs
	H_4	60 lakhs
	H_5	90 lakhs
C_2 (area Square ft.)	H_1	1140 sq. ft.
	H_2	36 sq. ft.
	H_3	1850 sq. ft.
	H_4	1411 sq. ft.
	H_5	783 sq. ft.
C_3 (facility)	H_1	Water, furnished, parking, gate, vastu, lift, power back up, security, fire alarm
	H_2	Furnished, power back up
	H_3	Furnished, power back up, gate, lift, parking, park
	H_4	Furnished, gate, lift, security alarm, power backup, water
	H_5	Water, furnished, power back up
C_4 (location)	H_1	School, hospital, garden, restaurants, airport, bank, bus stop, malls, petrol pumps
	H_2	Railway station, restaurants, bank, park, bus stop, school, hospitals, malls, petrol pumps
	H_3	Restaurants, airport, bank, bus stop, hospitals, malls, petrol pumps
	H_4	Restaurants, airport, bank, parks, bus stop, school, hospitals, malls, petrol pumps
	H_5	School, market, restaurants, air ports, bank, parks, bus stop, hospitals, malls

Table 2: Criteria for associated alternatives

There are fuzzy ratings for associated criteria and fuzzy weights for associated alternatives with their linguistic variables are defines in table 3 and table 4 as follows:

Linguistic variable	Triangular fuzzy number
Very Unimportant (VU)	(0,10,15)
Unimportant (U)	(10,20,25)
Slightly Unimportant(SU)	(15,30,40)
Middle (M)	(20,35,40)
Slightly Important (SI)	(35,40,60)
Important (I)	(50,55,75)
Very Important (VI)	(65,85,100)

Table 3: Fuzzy ratings for associated criteria using linguistic variable

Linguistic variable	Triangular fuzzy number
Very Unsatisfied (VU)	(0,0,1)
Unsatisfied (U)	(0,1,2)
Neutral to Unsatisfied (NU)	(1,1,3)
Neutral (N)	(2,3,5)
Neutral to Satisfied (NS)	(3,3,6)
Satisfied (S)	(5,6,8)
Very Satisfied (VS)	(6,9,10)

Table 4: Fuzzy weights for associated alternatives using linguisticvariables

The performance fuzzy rating matrix is as follows in table 5

Criteria Alternatives	C_1	C_2	C_3	C_4
H_1	SU	M	SI	SI
H_2	SU	VU	VU	SI
H_3	I	VI	SU	M
H_4	SI	SI	SU	SI
H_5	VI	SU	SU	SI

Table 5:Fuzzy rating matrix

After applying proposed algorithm step by step, the closeness coefficient which represents the distance to FPIS, A^+ and the FNIS, A^- simultaneously of the alternatives are calculated and represented in following table,

CC_1	0.3932
CC_2	0.3041
CC_3	0.3108
CC_4	0.2579
CC_5	0.2314

Table 6:Closeness coefficient

According to the highest closeness coefficient the rank of the alternatives is shown table 7

Closeness coefficient of alternatives		rank
CC_1	0.3932	1
CC_2	0.3041	3
CC_3	0.3108	2
CC_4	0.2579	4
CC_5	0.2314	5

Table 7: Rank the alternatives

According to the closeness coefficient, the ranking order of the five alternatives are $H_1 > H_3 > H_2 > H_4 > H_5$. Therefore, the best alternatives (i.e. home) is the home H_1 among the other four alternatives according to their criteria.

Conclusion

In this study the proposed model is applied to choose the best home from the set of desirable homes under the different criteria with the help of a decision maker. Overall, the fuzzytechniques are employed to preference the best alternatives under the uncertain environment to make the problem easy in real life applications.

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CLASS AND POLITICS IN VIKRAM SETH'S A SUITABLE BOY

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ABSTRACT

Vikram Seth's masterpiece is A Suitable Boy e a family saga in front of the vast panorama of the national life of India after partition. It will surely go from universities to trial parties, from politics to prostitution, from wild boar hunting to gardening, from poetry to agrarian reform, from judges to jewelers. As Proust describes, he creates in a time, city and country of infinite diversity in that is lived with joy and returns with reluctance and with this in mind, there are countless memorable characters, revolving around the simplest themes. The book A Suitable Boy deals with the power of religious festivals and processions and showcases the contemporary issues of india. So, this article aims to explore the class and politics in Virkam Seth's A Suitable Boy.
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Keywords: Vikarm Seth, Class, Politics, Realism

Introduction

Just over a decade after Midnight's Children's dramatic arrival on the world literary scene and its establishment as one of the canonical texts of postcolonial, yes, modern literature, Vikram Seth's *A Suitable Boy* in a Vibrant International Market was setting the tone. Fiction starts with almost the same much fanfare. Meanwhile, novels by writers with ties to the Indian subcontinent, matched by the tremendous critical success of Rushdie, have appeared on long and short lists of prestigious international awards. To the chagrin of some critics and readers, *A Suitable Boy* was not nominated for the Booker Prize, but had already risen to fame with the largest upfront payment to an Indian author to date. The nearly 1,500-page novel, according to his own statements, runs the risk of exhausting the reader's wrist and patience. Like *Midnight`s Children*, this novel has an epoch-making character; Unlike the above, the events in Seth's Saga take place over a period of less than two years, albeit two crucial years in the lives of the characters and the young nation.

A Suitable Boy additionally shares with Rushdie's epic novel the type of the family adventure, complete with overly complex genealogical records and point by point connection. In the two books, the family adventure is joined with a topical interest in the unfurling adventure of the new country in the wake of Independence and Partition. Simultaneously, *A Suitable Boy* is an emphatically, even tenaciously, unique sort of novel. Habitually referring to British creators, for example, Eliot, Austen, and Hardy, Seth unequivocally recovers nineteenth-century European authenticity, a sort that Rushdie's text plays with and, now and again, flamboyantly undermines. In spite of the fact that it is feasible to overemphasize the degree to which *Midnight's Children* withdraws from authenticity, it is absolutely the situation that Seth's text gives no quarter to the enchanted, the marvelous, or phonetic and formal fracture. Unsurprisingly, Seth's work has been compared to that of Dickens, Tolstoy, and Jane Austen, and in fact there are many possible points of comparison between depictions of the characters in this novel and those in Austen's novels, including them the matchmaker mother and a young man, an intelligent woman trying to form an opinion about love and marriage. Like Midnight`s Children, A Compatible Boy is also permeated by an awareness and passion for indigenous literary and cultural traditions, especially Urdu poetry, Hindustani classical music, the Ramayana, the Ramlila, Shia Marsiyas or Lamentations, Tagore `s-Song (`Rabindra Sangeet`) and, of course, Hindi cinema. But the crucial divergence between the two texts in their exploration of the moment and beyond India's legendary achievement of "Freedom at Midnight" lies in their relationship to allegory. If allegory abounds in Rushdie's text, it is surprisingly absent in Seth's.

The existence of the new country encroaches on the existences of the relative multitude of principle characters and it shapes the conditions where they endeavor to make their own narratives, however country and character don't reflect each other in any sense. As one might expect in a pragmatist novel, a lot of thought in *A Suitable Boy* goes into Xeshing out the inward existences of even the more minor characters and there is little interest in making these new printed distractions, political or in any case.

Seth's accomplishment is to have delivered an original that, generally, figures out how to hold thoughtful readably intrigue in 'everything' even as there are without a doubt digressive sections and even parts that appear strongly not exactly vital for the bigger scholarly plan. Apparently, Boy recounts to a straightforward tale about the journey attempted by Mrs Rupa Mehra to Wnd an appropriate match) for her more youthful little girl, Lata. The inquiry demonstrates intriguing, interesting, sincerely loaded, and, now and again, testing, for all concerned. En route, all way of occasions—some anticipated, others more emotional—happen in the lives of the four families associated by the obligations of marriage or companionship: the Mehras, the Kapoors, the Chatterjis, and the regal place of the Nawab of Baitar. Despite the fact that it's telling might be straight, the design of the novel is a long way from basic, substituting as it does between the existences of a few vital characters and between diVerent places including the little northern town of Brahmpur, a town in the country Rudhia region, and the city of Calcutta. There are likewise a few snapshots of Xashback, some oVered via account clarification, others as memories of characters. Consistently, Boy is an account of living souls and loves, driven by its characters rather than all-encompassing topical distractions.

In any case, *A Suitable Boy* is a chronicled novel in something like two ways. It is set, similar to an enormous piece of Midnight's Children, in a period foremost to the hour of its genuine composition and distribution, returning to a developmental recorded second in the existence of country and characters. Key verifiable occasions, as in Midnight's Children, encroach on the existences of characters, some

of whom, like Mahesh Kapoor, are even engaged with composing critical occasions, for example, the just somewhat fictionalized Zamindari Act, which references land changes really embraced by the Congress government soon after Independence. On occasion, Seth over long, somewhat wearying recorded disquisitions, summing up specific occasions in the way of a course reading. However, Boy is maybe generally significant as a completely historicized innovative investigation of how a specific social gathering what is today known as the Extraordinary Indian Middle Class—established itself. This is a moderately new verifiable gathering, one that has established itself accordingly, from one viewpoint, to the development of an officially mainstream country state and, on the other, to the continuous task from the nineteenth century onwards, of becoming both 'present day' and 'Indian'. In 1952, the recently composed Constitution was being deciphered in enactment and strategy; this was an undertaking in self-forming that had repercussions in the social and political circles as well as for familial constructions, relational relations, and designs of feeling and being on the planet.

The scope of a novel like is can be best be understood in terms of the scale of the task at hand: to understand, through the lives of four families, how that self-creation took place. In a helpful study, The Making of a Middle Class in Colonial North India, historian Sanjay Joshi argues that in many parts of the world, including India, the middle classes have played a vital role in denying what it means to be modern to be. In the process of decolonization, it would be this grouping, itself a diverse and clear phenomenon that would replace the British ruling classes. From the late nineteenth to the early twentieth century, says Joshi, in the reputation of the middle class was less an economic endeavor than a cultural one that being the middle class. It was primarily a self-design project.

It was a venture predicated on the making of new types of legislative issues, the rebuilding of standards of social direct, and the development of new qualities directing homegrown just as open life These cycles are addressed in A Suitable Boy, which is

particularly worried about the development of working class personality and subjectivity, both individual and group. Joshi's review is set in the North Indian town of Lucknow, one of the metropolitan places in the 'Hindi belt' that go into the creation of the fictional composite Seth calls 'Brahmpur'. Lucknow is in the Northern province of Uttar Pradesh which is changed into Seth's Wctional 'Purva Pradesh' (Eastern State) where Brahmpur is found. Joshi stresses the significance of what he calls 'open arena legislative issues' for the making of the working classes in pilgrim North India, a circle which, because it records and chronicles its own doings, is all the more handily got to by the student of history. Seth's original endeavors a venture better embraced by writing in exchange with history—an innovative remaking of how the undertaking of becoming present day may have unfurled in the circle of the individual and the passionate Despite appearances, the mission to Wand a 'appropriate kid' for Lata Mehra, a youthful English-instructed lady from an upper-rank Hindu family living in questionably cultured monetary conditions, is everything except 'conventional' in origination and activity. Becoming 'present day' places Lata and her family in a circumstance where neither a more established, more dictator method of organizing conjugal unions exclusively through family older folks nor inside and out individual decision through sentiment. In contrast to the relationships of her more established sibling and sister, Lata Mehra's possible coalition must feature the different accommodative tradeoffs that were becoming crucial for working class self-molding in North India. Here, individual decision should be given its place yet can't be permitted to supplant the bigger system of familial assent and cultural endorsement.

A progression of other directing conditions oversees the interaction: Mrs Mehra rejects imminent admirers not just for being 'excessively dull' or 'excessively tall', yet additionally for being 'extremely wealthy' in spite of the fact that she thinks about a decent pay fundamental. An admirer can be excessively Anglicized or Westernized, yet additionally dismissed for not having the option to 'communicate in English appropriately'. Inside the new system of

mainstream nationhood, advancement involves an affirmation of Indian personality yet an attendant and greater insistence on strict, yet additionally position, character: 'I believe one's own local area makes a feeling of solace' (Seth 594). As needs be, to be reasonable, the kid should be a Kayastha, from a North Indian exchanging rank tucked away in the more elite classes of the rank progressive system .It is this battle and the amazingly questionable nature of the triumph of the last mentioned, Nehru's reformist plan, that *A Suitable Boy* the two draws on and performs, most apparently in its records of Mahesh Kapoor's political fortunes and the very discussions on the field of the Brahmpur Assembly. In what likely could be the main gesture to public purposeful anecdote in this novel, this administrative gathering is a microcosm of the bigger public political material. Like his chief, Nehru, Mahesh Kapoor is blockaded by "acceptable individuals, awful individuals, glad individuals, despondent individuals . . . individuals who needed to pull him to the right, individuals who needed to drive him further towards the left, Congressmen, communists, socialists, Hindu Pentecostals, old individuals from the Muslim association who needed confirmation into Congress" (Seth 51).

In the Brahmpur Assembly, the main players in the battle are Begum Abida Khan, who addresses thelanded Muslim upper class and their inclinations, L. N. Agarwal, the Hindu patriot, and, obviously, Kapoor himself, exemplifying the formative and reformist push of Nehruvianism. He is the creator of the Zamindari Bill for his state, which, similar to the chronicled Zamindari Abrogation Acts, involved 'annulment by state enactment somewhere in the range of 1950 and 1954 of delegate privileges and residencies . . . Exclusive privileges over huge farming homes . . . were moved from a modest bunch of non-attendant landowners to express state run administrations' (Frankel 1978: 190). For Mahesh Kapoor, this involves putting really close to home fellowships in danger: 'If the way of life of a couple of good men like the Nawab Sahib must be sacriWced for everyone's benefit of millions of sharecroppers, it was an expense that must be borne' (Seth 283). As with the verifiable enactment that,

while taking into account some reallocation, 'missed the mark concerning an agrarian change', Kapoor's Bill is scorned by both right and left as either excessively revolutionary or excessively moderate. Like the moves that administer Lata Mehra's conjugal future, these administrative changes also 'bore the conspicuous signs of political trade off.

Like Midnight's Children, The Right Child is also aware of the utopian tenor of the moment of independence and the betrayal emanating from the nationalist vanguard represented by the Congress Party, as the decade unfolds in the realities of postcolonial existence. For Rushdie, the betrayal is embodied in the figure of the widow; for Seth it began much earlier in and his tragedy is the marginalization of the incorruptible idealist Masterji.

When he was in jail, his wife, with no one to support her, had died of tuberculosis, and his children, reduced to eating other people's scraps, had suffered nearly fatal starvation. With the coming of Independence he had hoped that his sacrifice would result in an order of things closer to the ideals he had fought for, but he had been bitterly disappointed. He saw the corruption that had begun to eat into the rationing system and the system of government contracts with a rapacity that surpassed anything he had known under the British. The police too had become more overt in their extortions. (Seth 342)

Seth's original catches a second in the adventure of India when the oppositional turns into the standard through a 'slow slide into carelessness, advocating Gandhi's admonition contrary to English guideline without Englishmen. The Indian National Congress, a lively anticolonial association, transforms into a "extraordinary, undefined, moderate that requests instead of orders political devotion" (Seth 884). The political scene itself is dynamic "bursting at the seams with goals' in Khilnani's term, and molded by the antinomies of 'post-Independence sentimentalism and post-Independence disappointment" (885). The fundamental partition of the Congress party from its job as a vanguard of autonomy from its job as another party on the vote based scene is

exhaustingly opposed by numerous individuals inside its positions, as proposed by the face-between the nearby lawmaker and the genuine authoritative over raising money. Though emphatically not a subaltern history, the novel does, in passing, take note of those marginalized by the sweeping movement of the nation towards realizing its own modernity and vaunted place in world history: the low-caste man, the peasant (Kachheru, who will be further disenfranchised by the compromises of agrarian reform) and those like the nameless farmer who will be left out by something as simple as language:

'Do you speak English?' he said after a while in the local dialect of Hindi. He had noticed Maan's luggage tag.
'Yes,'said Maan
'Without English you can't do anything,'said the farmer sagely.
Maan wondered what possible use English could be to the farmer.
'What use is English?'said Maan.
'People love English!' said the farmer, with a strange sort of deep-voiced giggle. 'If you talk in English, you are a king. The more people you can mystify, the more people will respect you.' He turned back to his tobacco. (Seth 543)
The silent death of idealism, portrayed in the tragedy of Rasheed, young Muslim socialists, a man who has promised to sacrifice part of his own heritage to unleash such subaltern thoughts,Wanly only takes a note at the end of the novel, a passage sad mention of shorter chapters and few lines of poetry.
Peace. No prayers. No more prayers.
To sleep is better than to pray. O my creature, you gave your life too soon.
 I have made your entry into Paradise unlawful.
     A spring in Paradise. O God, O God.
(Seth 1438)
Seth ends his blockbuster with a wedding, not a funeral it is a Hindu wedding, but according to the customs of the time it is carried out under the protective and equal patronage of the state and its civil laws. This article has stated that the novel itself and its often broken promises regarding the rights of women and other marginalized groups.

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AN ANALYSIS OF EMOTION AND FOREIGN LANGUAGE ANXIETY AMONG SECOND LANGUAGE ACQUISITION LEARNERS IN INDIAN SCENARIO: A STUDY WITH SPECIFIC CONSTRAINTS OF RAJASTHAN

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ABSTRACT

Emotion play an important role in language learning. Learning a foreign language always creates a certain level of anxiety among SLA learners. The present paper discusses the issue of role of emotion and foreign language anxiety in language learning. Paper describes and analyzes the various factors which involve the Foreign Language Anxiety scale among learners. The paper employs data analysis techniques for factor analysis and reflects the real time scenario of Indian classroom. Indian students have massive impact of foreign language anxiety situation. The papers establish a direct correlation between foreign language learning and anxiety. Paper concludes on the note that a very emotionally quotient equipped teachers are required to increase the performance of SLA learners in English for specific purpose classrooms.

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Keywords: *Foreign language anxiety, Second Language Acquisition, Classroom interaction, Instruction Design, Language test , Performance.*

Introduction

Emotions, according to Goleman (2005), are an essential component of one's existence in all areas. Emotions have a significant impact on language learning situations (Arnold, 1999). Traditionally, however, language scholars have placed a greater emphasis on cognitive components of the language learning process (Dewaele, 2011). Students' performance and academic accomplishment can be severely harmed by negative emotions such as foreign language fear. Anxiety might cause kids to be silent in class and unable to participate in activities (Horwitz et al., 1986b).

Students are required to engage and participate more in classes as a result of the paradigm shift in English language teaching methodology from the teacher-centered and Grammar Translation Method to a more student-centered and Communicative Language Teaching Method (Brown, 2001). However, this is not always the case, as most pupils choose to keep silent in class. The following questions arise as a result of this situation: Why are some pupils in the classroom so quiet? What's preventing people from interacting and taking part? The responses to these questions could stem from a range of cognitive factors.

This study has investigated students' emotional states and affective elements that prevent them from fully participating in classroom communication; it will focus on foreign language speaking anxiety.

Background of the study

Due to their concern, many students avoid speaking in English lectures and remain silent (Young, 1990). As seen by the following remark: "I fear it when the teacher calls on me to speak; I freeze up and can't think of what to say or how to say it." In addition, "my pronunciation is horrible. Sometimes I get the impression that other learners don't grasp what I'm saying" (Young, 1990, p. 539). Such situations have been an important factor that learners 'quit' their language classes in extreme situations.

Horwitz et al. (1986b) categorised anxiety into three elements based on the psychology idea of anxiety: communication apprehension, test anxiety, and apprehension of poor assessment. When it comes to talking with others, communication fear emerges as a shyness. In a foreign language scenario, communication fear is exacerbated by learners' level of comprehension of the foreign language. The stress of making mistakes and failing in testing circumstances, whether written or oral, is the second component of test anxiety.The third component, fear of negative assessment, is comparable to test anxiety but has a broader reach because it encompasses not only test circumstances but any social context in which

students are judged on their foreign language ability (Horwitz et al., 1986b).

Another factor that contributes to the significance of this study is the fact that Foreign Language Anxiety (FLA) has mostly been studied on Western countries (Dewaele&MacIntyre, 2014). In the state of Rajasthan,no study has been done. As a result, the current study will contribute to the advancement of knowledge in the subject of FLA by including the Indian context.

Rationale of the study

Many other characteristics, such as command of foreign languages and language proficiency, have been linked to anxiety in some studies (Dewaele&MacIntyre, 2014). However, more research into the relationship between language competency and anxiety is required in order to determine the impact of the former on the latter. As a result, the purpose of this study is to look at the possible relationship between English language proficiency and students' speaking anxiety, using a research question and objectives as a guide.

Objectives of the Study

The purpose of this study is to find out what the relationship is between foreign language speaking anxiety and English language proficiency. The overall goal of this research is to look into the link between foreign language speaking anxiety and English language proficiency. This study's particular objectives are to: 1) use the Foreign Language Classroom Anxiety Scale (FLCAS) to assess students' level of speaking anxiety (see Horwitz et al., 1986a); 2) conduct classroom observations to: a) identify nervous students; b) assess their English language competency levels. 3)Conduct and analyse interviews with anxious students to learn about their feelings about their anxiety and their academic abilities.

Review of Literature

Foreign language classroom anxiety (FLCA) or foreign language anxiety (FLA) is a very relevant and important affective variable in the complex process of learning a foreign language, according to language scholars (Horwitz, Horwitz, & Cope, 1986b; Arnold, 1999; Agudo, 2012). According to Gardner,

Brown, and Ellis' findings, anxiety can be classified into three types: trait anxiety, state anxiety, and situational anxiety. Horwitz et al. (1986b), pioneer researchers in the field, characterised FLA components as three-folded and connected to communication apprehension, test anxiety, and fear of unfavourable assessment, based on the psychology conception of anxiety.

According to Argaman and Aburabia's research, FLA is a result of underachievement rather than a cause of it . Trang (2012), on the other hand, noted that determining whether FLA is the cause or effect of underachievement is problematic. The author used the example of the chicken and the egg to further illustrate his thesis. Which one is the most important? It's difficult to tell whether low performance causes worry in students or if anxiety causes students to perform poorly (Trang, 2012). Trang's points appear to be well-founded. It's difficult to say if worry is a cause or a result of underachievement with clarity.

The FLCAS (foreign language classroom anxiety scale) has been chastised for measuring language abilities rather than distress. However, like with any data collection tool, the questionnaire can be interpreted in a variety of ways, leading to a variety of viewpoints. FLCAS has been used in a number of FLA research to assess students' anxiety levels, and it is thought to have high internal consistency (Trang, 2012; Al-Shboul, Ahmad, Nordin, & Rahman, 2013). Despite the role of FLA in language learning, some scholars believe that worry is a universal human emotion (Agudo, 2012).

Anxiety is thought to be a component that can block language comprehension at the input stage, similar to how a filter can obstruct learning. Learning will not take place if the filter is not decreased (Krashen, 1982). Gkonou (2011) conducted an empirical investigation that corroborated Krashen's understandable input hypothesis, which found that uncomprehensible input decreased students' self-efficay and increased their anxiety (Gkonou, 2011). Anxiety has also been demonstrated to impede students from communicating and contribute to their self-esteem being lowered (Horwitz et al., 1986b; Agudo, 2012).
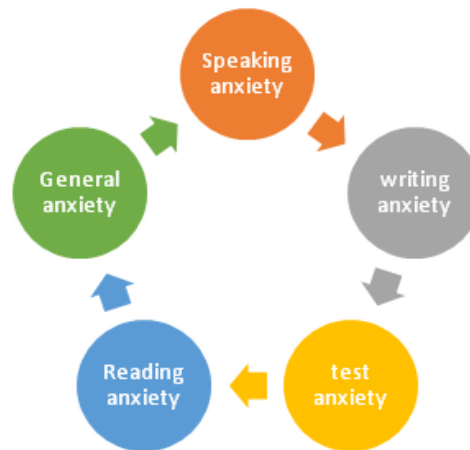
Types of anxiety researched in FLA literature

Figure: -1 Types of anxiety

A second language Students' anxiety is thought to have psychological, behavioural, and physical implications (Horwitz et al., 1986b; Suleimenova, 2012; Aydin, 2013; Wang &Roopehund, 2015). Horwitz et al. (1986b) identified psychological impacts of anxiety, such as attention and memorising issues. Furthermore, these students reported behavioral effects of anxiety, such as missing classes and deferring schoolwork, as well as bodily effects, such as sweating and a racing heart (Horwitz et al., 1986b).

According to various studies (Tiplakides, 2009; Trang et al., 2015; Wang &Roopehund, 2015), low language competency is the main cause of anxiety and has a negative link with foreign language anxiety (Al-Shboul et al 2013; Dewaele&Maclntyre, 2014; Dewaele& AL-Saraj, 2015). For example, Al-Shboul et al. (2013) found a negative link between self-perceived proficiency and anxiety in a systematic review of literature on foreign language anxiety.

Research Methodology

Students selected for study were taken from a higher secondary school(K-12) based in Jaipur region of Rajasthan. Total 187 students participated in survey, interaction and interview conducted by the researcher. The medium of Instruction in the school was Hindi. Three instruments (classroom observation, questionnaires, and interviews) were employed to gather data since the current study aimed to collect and analyse data using both quantitative

and qualitative methods (mix-method approach). A mix-method approach is justified on the grounds that combining the two methodologies offers a broader understanding of the study problem (Cresswell, 2012, p. 22). Furthermore, when utilised in the educational field, the quantitative technique has been widely criticised for its exaggerated quantification and other drawbacks.

Classroom observation was the first phase. The goal of the classroom observation checklist was to assess students' oral and general skill levels as well as detect indicators of foreign language anxiety. Students' general language proficiency was categorized into five groups using a 1-5 Likert scale (5-very good, 4-good, 3-average, 2-below average, and 1-poor). The administration of the questionnaires was the second phase.

The current study used a correlational design (Cresswell, 2012) to determine the impact of the independent variable English language proficiency on the dependent variable foreign language speaking anxiety. The goal of a correlation design like this is to see if there's a link between students' anxiety and their English language skills.

Discussion and Analysis

A questionnaire was distributed to all students and students responded to 23 questions out of which 18 questions were quantitative and Each participant's anxiety score is assigned to each questionnaire they complete. Anxiety levels ranged from 18 to 87. Anxiety levels

among students were classified into three categories and three measures. As indicated in table 1 below

Category	Anxiety level	Scale
Over the average	High	60-90
Average	Moderate	30-60
Below the average	Low	0-30
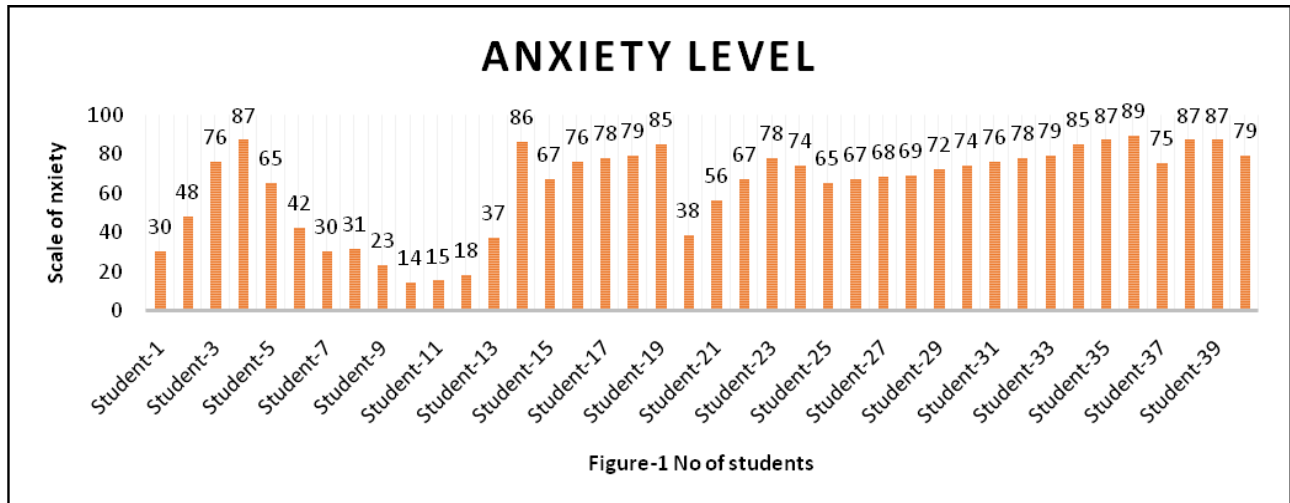
As it is evident from the figure that anxiety is usually high among the students whether be it Hindi medium or English medium instruction schools, average value of surveyed students is 64.28 which is the band of over and average. Survey revealed that in classroom environment in majority their anxiety is usually on the higher side. It was evident that there only 19% students were there who did not suffer anxiety in language classroom, however they all come from English medium school.
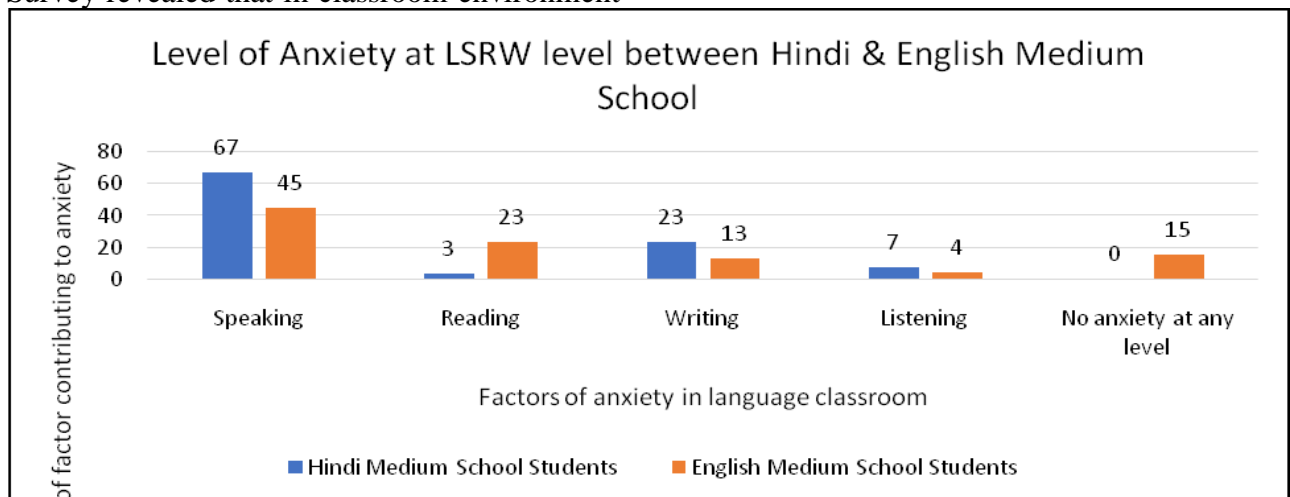

Figure:2 Factors contributing to anxiety

Students' data was analyzed for anxiety at LSRW Scale. Hindi medium students accepted that their anxiety level is always high when they are asked to start speaking English in the class, while English medium students were very relaxed as far as their participation level was concerned. However, at listening scale it was found that anxiety level is equal among students as far as listening was concerned.

There were few students in english medium school who admitted that they faced no anxiety at any level.

Students were observed for their overall English proficiency on a five-point Likert scale. Students were asked couple of questions and were monitored for their score. Survey reveals that there are almost 35% students who were below average, and they failed to write

and speak basic sentences in English. All students who scored above average were from English medium instructional schools.

Figure 3: Students performance on General Proficiency Test
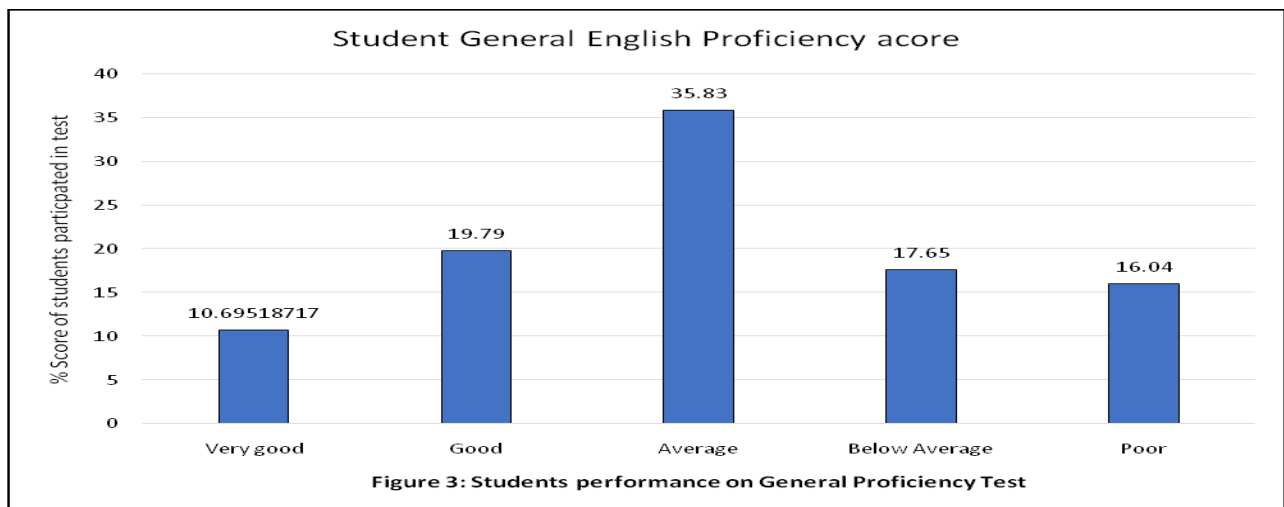
The present study tried to explore the relationship also between anxiety and language proficiency. Student data was analyzed in Microsoft excel to analyze relationship between independent factors. Excel correlation graph feature was used for the same. The data table below shows the relationship between proficiency and anxiety of this survey reveal that anxiety and performance are correlational.
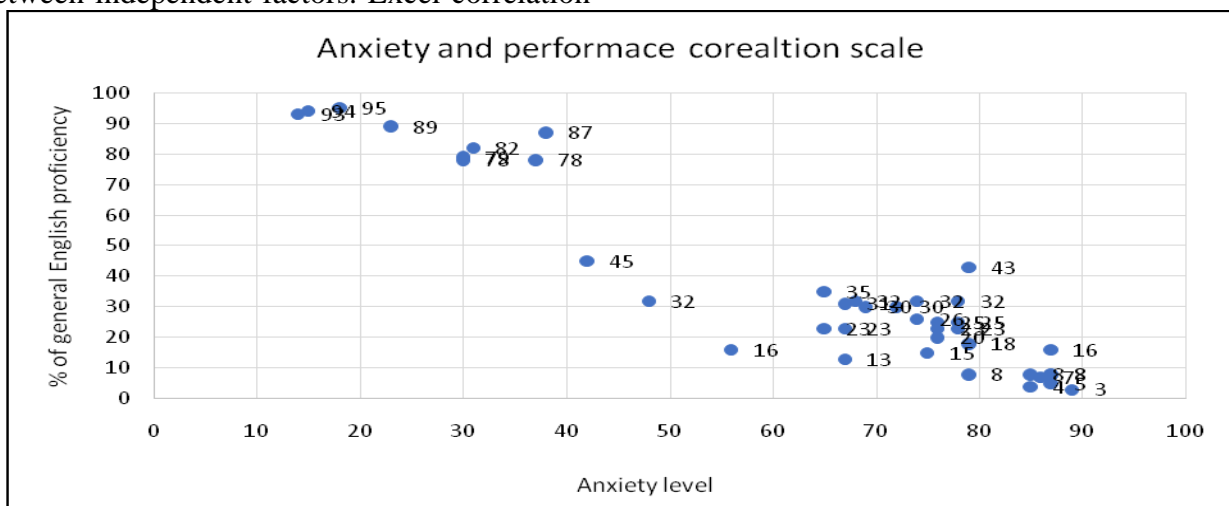

Figure 4: Anxiety level vs General Proficiency level

Data received from the correlational analysis reveals that anxiety creates a direct impact on student performance. Student who had less anxiety level they performed better in their English proficiency test.

Findings of the study

Researcher have reached to find out following factors which a class instructor should consider in a class or environment where anxiety is very high students anxiety increase in situations where; studentswere asked to speak without preparation, surprise tests, classroom reading activities. Study revealed that there is a direct correlation with anxiety and language learning. Students are highly in state of anxiety in language learning classes. These situations lead students to become reluctant in participation in language classes. Specific courses and teaching methods are required to handle student's anxiety in English for academic purpose. Student also get apprehensive of communication situation. The goal of this research was to see if there was a link between foreign language anxiety and English language proficiency. The findings show a negative link

between foreign language speaking anxiety and proficiency, with the higher the anxiety, the lower the competence and vice versa.

Conclusion

Participants appear to have foreign language speaking anxiety because of their inadequate command of the English language. Poor language skills appear to have a negative impact on kids' anxiety levels. As a result, there is a moderately negative relationship between foreign language speaking anxiety and English proficiency. Students are terrified of making mistakes because of their low perceived proficiency; thus, they choose to keep silent inside the classroom. Their performance suffers because of their nervousness, which prevents them from actively participating in classroom activities. Students' ability to acquire their full linguistic abilities is hampered by communication anxiety.

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"PERSONAL GUARANTOR TO CORPORATE DEBTOR" – INTERPRETING THE APPLICATION UNDER THE PRESENT INDIAN LEGAL REGIME

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ABSTRACT

In recent times, entrepreneurship is a progressive form of business. Credit facility of banks is prime source of businesses in India. Generally Companies finance loans from banks on personal guarantee of Managing directors, chairman and promoters as their own stakes are invested in the company. Under Insolvency and Bankruptcy regime of the country, personal guarantors are covered for the recovery of loans from the companies parallel to corporate insolvency resolution process against the corporate debtor. Via notification 2019, certain provisions of Part-III of Insolvency and bankruptcy code 2016 have been notified to give effect to the same. As guarantee is also dealt in Law of Contracts of Indian scenario, it would be interesting to compare the recovery of money under Indian Contract Act 1872 through contract of guarantee and as personal insolvency under Insolvency and Bankruptcy code 2016. This paper would analyze the effect of recovery of company loan from personal guarantor to corporate debtor over Indian Contract Act 1872.

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Keywords: *Personal Guarantor, Corporate Debtor, Insolvency.*

Introduction

Entrepreneurship and credit facility goes hand in hand. Economy of India is primarily based on continuous credit flow in the market. Banks and other financial institutions aremain provider of the credit. To ensure continuous credit flow in the market insolvency and bankruptcy code 2016, enacted by the Legislature of India. The code provided proper mechanism for the recovery of debt by the corporate debtor or personal debtor. The code has majorly V parts Out of which Part II is dedicated for resolution process of corporate debtors and Part III is dedicated for resolution process of personal debtors. Resolution process for corporate debtors have been implemented in 2016 itself. Part III is yet too notified by the legislature. Via notification of 2019, personal guarantor to corporate debtor is notified by the central government. Personal guarantors are individuals who have given guarantee for the payment of loan are credit taken by the corporate debtor. Under the code personal guarantor is defined under section 5(22). Though the concept of contract of guarantee is already defined under section 128 of the Indian Contract Act 1872. That clearly define the role of surety or the guarantor. in the contract three parties are involved where in the personal debtor has primary liability to pay off its debt to the creditor, in case the personal

debtor fails to repay the loan amount surety will have to pay on the behalf of personal debtor. Therefore it can be said that the liability of guarantor is coextensive with the liability of personal debtor. Before the Enactment of the code Provincial Insolvency act 1920 and the presidency town insolvency act 1909 were addressing the resolution process of individuals and partnerships. These legislations were not compatible to the present market analogies. The insolvency and bankruptcy code 2016 was elected for providing a consolidated mechanism for the insolvency in time bound procedure. With the notification of 2019 the insolvency resolution process with respect to personal guarantor now could be filed with the resolution process of the corporate debtor. This paper is going to discuss the applicability of the provisions of Insolvency and Bankruptcy Code 2016 on personal guarantor and the validity of the provisions in light of personal insolvency Laws.

Procedure under the Code

The process of Insolvency against personal guarantor is given under rules of "Insolvency and Bankruptcy (application to adjudicating authority for Insolvency Resolution Process for personal Guarantors to Corporate Debtor rules)". The application for the initiation of the insolvency resolution process against corporate

debtor and personal guarantor can be filed To National Company Law Tribunal. The application can be filed to the Tribunal either by the creditor or the resolution professional (hereinafter referred as RP). In case of creditor filing application against the guarantor a demand notice has to be served under rule 7(1) of the said rules. It is the liability of the personal guarantee to pay the loan amount to the creditor within 14 days from the receipt of the notice. In case the guarantor defaults in the payment of the payment, creditors becomes entitled to file for insolvency process before NCLT. Creditor may file an application by attaching the relevant documents. After the filing of the application the copy of it shall be sent to the personal guarantor and the corporate debtor. As soon as this application is filed, interim Moratorium shall begin against all the creditors. This will prohibit the creditors from filing any legal action against the personal guarantor in relation to debt.

If the application in filed by resolution professional under section 98 of the said code, the insolvency and bankruptcy board of India will check whether any disciplinary action is not going against the RP. After the appointment Of RP he has to recommend for the acceptance projection of the application.The application would examine the eligibility of claims of guarantor or creditor. Adjudicating authority (herein after referred as AA) may in its discretion by applying judicial mind allow or reject the application with fourteen days of the filing. If the AA is satisfied that the application is filed to defraud the creditors of the company, creditors can file for bankruptcy under section 100 of the code. As soon as the application is admitted, moratorium comes into force with respect to legal proceedings. Ongoing legal actions to be stayed and creditors are barred from initiate any legal proceeding against personal guarantor.

After successful admission o\f the application AA calls for the claims from the creditors of the personal guarantor, who shall submit within twenty one days from the sending of claims. It is the responsibility of the creditors under section 103 read with Regulation 7(1) of the said rules to register the claim with proves with the RP. Subsequently RP will prepare the list of claims after verifying the information received from the creditors.

A repayment plan shall be prepared, the object of that would be fulfill the claims of the creditors against the Personal Guarantor. It may provide the details of the assets of PG for transfer and sale in regard of satisfying the claims of the creditors. This plan has to be submitted by the RP to the AA under section 106 of the said code of the approval. AA may require a meeting of creditors to be conducted for approving the repayment plan.The voting rights of creditors would be proportional to the percentage of debt owned by him. The plan should be approved by more than three fourth in value percentage of creditors. The report on the plan has to be prepared by RP and submitted for due approval by the AA. It shall be further implemented by repaying to the creditors.

In case the claims of debtors and creditors are not fully satisfied, they shall be entitled for filing bankruptcy application against the personal guarantor.

Challenge on the validity of liability of Personal Guarantor

In the landmark judgment of Lalit Kumar Jain v. Union of India, validity of the notification 2019 is was challenged in Hon'ble Supreme court of India. Insolvency and Bankruptcy Board of India filed an application in the court for clarification as to the validity of the said notification. It was specifically challenged the validity of keeping the personal debtors with corporate debtor under insolvency resolution process, and deleting it from the ambit of personal insolvency.

(a) Contention from the side of petitioner

- Overlapping petitions- The creditors can invoke resolution process against the personal guarantors through corporate insolvency resolution process and a petition against the PG for recovery of the debt under Contract.

- Limited Application to be arbitrary- The provisions came into effect via notification of 2019 is selectively came into force in relation to PG. The provisions are wholly applicable to individuals, and partnership firms but Government without authority

applied the provisions in limited sense. That makes it arbitrary on part of government. There is lack of intelligible differentia in applying the same \provision for one set and not for other set of class of individuals and partnership firm.

- Liability is co-extensive but not primary- It was argued that liability of personal guarantor is co-extensive with that of principal borrower. Extinction of liability against borrower would also seizes the liability of PR. On the event of approval of the repayment plan the liability of the principal borrower gets decreased to the agreed amount of payment. Therefore the liability of PG should also get decreased proportionately and discharge of liability to be effected on the discharge of borrower.

(b) Contentions from side of Union of India

- No recovery of double claim- It was argued from the side of defense that financial creditors will not recover the claim doubly but the balance debt only. The amount which remains unsettled and unpaid by the borrower shall be recovered from the PG. The Indian Contract Act 1872 prohibits the creditor from recovering sum more than the debt owned by the principal borrower.
- Principal of Double Dip- It was argued that creditor can recover a part of claim to one type of debtor either Principal borrower or the PG. The other part can be claimed by the other debtor.
- Bonafide objective – It was contended that the bringing the process of bankruptcy against personal guarantor with the corporate resolution process has an objective of speedy recovery and resolution of the company. Would it be a condition of not unifying the two, it would become useless to exclude PG from the CIRP process. As PG are responsible to the

company, it would make the process incomplete without recovery from the PG. Personal guarantors are similar to corporate guarantors as they are providing guarantee for the corporate debtor, it would be not proper to bring different petition for same corporate debtor against corporate guarantor and personal guarantor.

Decision by Apex Court

The court has decided in favor of the government. The rationale given by the Hon'ble court is that the objective of the notification is to bring a harmony in the corporate resolution process. As the personal insolvency is treated by part III of the code and the adjudication authority for personal insolvency is Debt recovery tribunal. Liability of PG will not extinguish with the approval of resolution plan. Section 2(e), 5(22), section 60 and section179 are in connection with PG. apex court has emphasized that PG cannot move away from the liability if the resolution plan is accepted. It will provide a complete and comprehensive disposal of corporate insolvency process.

Conclusion

The judgment has two folds, one is in the benefit of the creditors and other is risk to the promotors, managers of the company who have invested their stake in the project. If the scenario is only seen from the eyes of creditors, it gives whole security to the creditor as the personal assets of PG can be sold out for the purpose of realization of debt amount. Whereas the object of limited liability of a corporate entity gets diluted with this judgment. IBC 2016 has a primary object of revival of entities and promotion of entrepreneurship in the economy, but after this judgment it can impact the personal guarantors and industrialist who invest in new projects, who will fear of losing their own assets.

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AN SSF TECHNIQUE UTILIZED COW DUNG AS A SUBSTRATE TO INVESTIGATE BACILLUS CEREUS IND4"S

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ABSTRACT

An SSF technique utilized cow dung as the substrate to investigate Bacillus cereusIND4's ability to produce amylase. The research used a one-variable-at-a-time approach with a two-level full factorial design to optimize the SSF conditions. Several variables had a substantial impact on enzyme production. This included moisture, pH, fructose, yeast extract, and ammonium sulfate (p 0.05). A central composite design was used to find the optimum concentration of various amylase-influencing variables. Amylase synthesis peaked at 464 units/ml when conditions included 100% moisture, 1% fructose, and 1% ammonium sulfate. When compared to the original medium, enzyme synthesis increased thrice. Amylase activity is best carried out at pH and temperature settings of 8.0 and 50°C, respectively. A pH range of 7.0–9.0 was not a problem for this enzyme, and it preserved 32% of its activity following a single denaturation step at 50°C for one hour. Using cow dung as a low-cost substrate, these microbes produce amylase for the first time.

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Introduction

This study is being carried out to collect, identify, and describe microorganisms from cow dung. Cow dung increases the mineral content of the soil, strengthens the plant's resistance to pests and diseases, and promotes plant development and other beneficial activities such as sulfur oxidation and phosphorus solubilization. The majority of cow dung is water, with a nutrient-dense matrix of undigested plant material, microbes, and their metabolites. Cow dung contains a wide variety of microorganisms, such as bacilli, lactobacilli, and cocci, as well as known and unknown fungi and yeasts. Amylases account for approximately 25–30% of the global enzyme market (Vijayaraghavan, Kalaiyarasi, & Vincent, 2015) and are critical for biotechnology due to their importance in industrial enzymes. These enzymes are used in various industries, including food, fermentation, textiles, and paper, making them extremely valuable in the commercial world. Submerged fermentation (SMF) is a standard method for producing enzymes such as amylases. Cow manure may contain a high concentration of nutrients. It is composed of nitrogen (1.2–1.6% of the total), cellulose (35.4%), hemicelluloses (32.6%), ash (13.3–13.4%), and growth elements (Sharma, B., & Singh, M. (2015).). The cost and availability of the substrate material are the essential factors in selecting an acceptable agrobiotech waste for enzyme production. Cow dung has 160 percent more enzymes per milliliter than wheat bran, according to new research. Cow dung is less expensive than other agricultural wastes, and it is also more readily available. Cow dung has never been shown to be a substrate for amylase synthesis before, so the findings presented here are crucial. Because of this property, cow dung may be used to produce amylases.

Preparation of cow dung suspension.

Suspensions of cow dung may be produced using the serial dilution technique. One gram of cow dung collected and labeled should be combined in 10 ml sterile phosphate buffer and forcefully shaken in a vortex for 2 minutes to ensure appropriate sample mixing. All samples should be incubated in an incubator at 370C for 30-40 minutes before plating to activate the bacterium. Following incubation, standard dilutions of each sample should be produced using a sterile pipette. Phosphate blanks are produced using this technique. Each blank contains 9 ml of sterilized phosphate buffer. The labeled tubes are put on the test tube stand, 1ml of activated standard solution is aseptically transferred to test tube 1, 1ml of sample is transferred to test tube 2, and the same process is repeated for each dilution (Gupta, Aneja, & Rana, 2016).

Isolation and Purification of microorganisms

Purification of the various bacterial cultures is accomplished using the streak plate technique on the Nutrient agar medium. Using a sterilized inoculating loop, gently pick up the colony from the spread plate and move it in a zigzag manner over the surface of another plate. Sterilize the loop over the flame, then adjust the plate to 900 and drag the loop over the previously streaked region in an identical fashion. Sterilize the loop once more over the flame and repeat the procedure; all plates should be incubated for 24 hours. The first section exhibits the most rapid development, whereas the third sector exhibits solitary colonies. This procedure is done many times until only pure colonies remain. Bacterial cultures that have been purified are maintained on Nutrient agar slant (Pooja et al., 2015).

Antibiotic susceptibility assay

The Kirby Bauer or disc diffusion technique is the most often used method for determining antibiotic resistance. In this test, a bacterial isolate is evenly injected over the surface of an agar plate. A filter disc impregnated with a standard quantity of an antibiotic is placed on the plate's surface and allowed to permeate into the surrounding media. As a consequence, a gradient of antibiotics surrounds the disc. Following incubation, the plate develops a bacterial lawn. Zones of bacterial growth suppression may exist around the antibiotic disc. The extent of the zone of inhibition is determined by the antibiotics' diffusion rate, the microorganisms' degree of sensitivity, and the bacterium's growth rate (Akintokun, Abibu, & Oyatoogun, 2017). Discs with very tiny zones of inhibition or no zones of inhibition indicate that the bacteria are not sensitive to the antibiotic. Large zones denote susceptibility levels: Susceptible (S), Intermediate (I), or Resistance (R) Isolation and characterization of microorganisms in desi cow dung using various morpho-biochemical parameters.

Characterization of amylase

The pH, temperature, pH stability, and thermostability of crude amylase may all be determined. Amylase activity is detected in the pH range of 8–10, with the highest level of activity occurring at pH 9. The fact that enzyme activity increases with increasing pH toward the alkaline range shows the enzyme's alkaliphilic character. Amylase in its crude form is stable at an alkaline pH range of 8–10 for 1-hour Enzyme stability is low at pH values ranging from 5.0 to 7.0. All of the properties of crude amylase have been established, including stability under different pH and temperature conditions. In the acidic and neutral pH ranges (5.0–7.0), enzyme stability is low. The findings of this study clearly demonstrate that the enzyme's alkaliphilic nature and utility as an additive are industrially relevant properties. The pH stability of Bacillus methylotrophicus strain P11-pH 2 can be used to compare the pH stability of crude amylase. Between pH 6.0 and 9.0, B. methylotrophicus amylase is stable for an hour, with diminishing residual activity between pH 4.0 and 5.0. Amylase is a thermostable enzyme that works best at 65°C (Rajeswari, Poongothai, & Hemalatha, 2016). The results are comparable to those of a previously described amylase from Nocardiopsis sp. According to the findings of this study, this enzyme is a good additive due to its alkaliphilic nature. Amylase is extremely stable between 40°C and 70°C, with 70°C being the maximum temperature. Bacillus sp. BCC 01-50 crude amylase is active between 30°C and 95°C, with 65°C being the best temperature; Amylase is extremely stable between 40°C and 70°C, with 70°C being the maximum temperature. When heated to 70°C, however, the enzymatic stability deteriorated. We discovered that the enzyme was completely stable when tested at 65°C and pH 9.0. This indicates that the enzyme has an alkali-heat dual extreme property (Rajeswari, Poongothai, & Hemalatha, 2016).

Screening of physical factors and nutrients

Physical variables such as humidity and medium pH have a significant effect on amylase production. Among the many variables that influence microbial growth and enzyme production when SSF is used in conjunction with certain substrates, the moisture level is one of the most crucial. The findings of this research indicate that carbon and nitrogen sources affect enzyme production and that fructose and yeast extract have the highest activity. Yeast extract increased amylase

production in B. subtilis. According to Arasaratnam & Thayaananthan (2014),. Various carbon sources have a varying effect on extracellular enzymes, particularly amylase strains. This research determined ammonium sulphate to be the best appropriate inorganic nitrogen source for B. cereus IND4. Shown that ammonium salts increased amylase production.

Discussion

There are very few works dedicated to the study of Bacillus species isolated from a variety of environments. Due to their widespread distribution and capacity to persist under harsh conditions, heterotrophic Bacillus strains are seldom regarded to be species exclusive to certain environments. Bacillus is a large and diverse genus with 83 validly identified species to date. Numerous species in this taxon are clinically significant, including Bacillus cereus, Bacillus anthracis, Bacillus thuringiensis, Bacillus mycoides, and Bacillus weihenstephanensis, but regrettably, members of the group exhibit a high degree of morphological and biochemical similarity. Laborious, costly, and imprecise, a quick conclusive technique is critical (Pathania, Sharma, & Handa, 2017). Rapid species identification is increasingly being accomplished via molecular techniques. In comparison, this genus's environmental and non-pathogenic species show a wide variety of physiological characteristics, DNA base content, and dietary needs.

Temperature ranges for bacterial isolates' growth are established by incubating strains for 24 hours at temperatures ranging from 35 to 70°C. It is worth noting that most isolates can grow up to 65°C but cannot develop beyond that temperature. The isolated strains are thermophilic organisms capable of growing at temperatures over 50°C. Using the zone clearing method with the appropriate substrates in the agar medium, all isolates were tested for amylase, cellulase, -galactosidase, lipase, and esterase activity. Mondal, Samantaray, & Mishra, (2015). utilized a plate test to search for bacteria that degrade polysaccharides and proteins. All strains demonstrated extracellular multienzyme activity in our research. However, most isolates produced amylase (82%) and esterase (74%), whereas 66 percent produced lipase and -galactosidase (Islam, 2016). Compared to other enzymes, the percentage of cellulase generating isolates was lower (50%) than for other enzymes. The low number of cellulase producers is most likely owing to the hot spring water's low organic matter concentration (Ya'aba & Ramalan, 2020). Aarti, Khusro, & Agastian (2017). reported Bacillus sp. producing extracellular lipases and esterases, whereas Kohli, Tuli, & Singh, (2014).found Bacillus sp. isolated producing -galactosidase.

The isolate exhibiting the greatest zone of starch hydrolysis was chosen and identified as Bacillus sp. WA21, a gram-positive bacterium belonging to the genus Bacillus. Bacillus members were discovered to be superior producers of -amylase (Sethi & Gupta, 2015). Optimizing culture conditions such as medium composition, temperature, and pH is critical for enzyme synthesis (Semwal et al., 2018). The impact of various temperatures on -amylase synthesis is shown in Figure 2. As a result, the optimal temperature for Bacillus sp. WA21 growth and -amylase synthesis was determined to be 45°C, and this temperature was chosen for future enzyme production experiments. According to Deejing & Dittamart (2015). the optimal temperature for Bacillus isolated from hot springs is 45°C. Our results corroborate Pranary et al(2016) . 's observation that thermophiles generated the most active enzymes at temperatures near to the generating organism's optimum growth temperature. Our findings demonstrated that the optimum circumstances for cell development were also optimal for enzyme synthesis. pH has a critical impact on the development of the generating organism and on the production of -amylase. According to our findings, both Bacillus sp. WA21 growth and -amylase production persisted across a broad pH range (3-11). However, pH 6 was shown to be optimal for growth and enzyme synthesis. Ya'aba & Ramalan, (2020). shown that Bacillus sphericus may generate extracellular enzymes when cultivated at a pH range of 6-9.

The use of any enzyme for starch hydrolysis is contingent upon its ability to breakdown native starch to oligosaccharides, glucose, and other products at elevated temperatures and across a

broad pH range (Lealem & Gashe, 2018). The capacity of Bacillus sp. WA21 to breakdown native starch across a broad pH range, as well as the thermal stability of -amylase, making this bacterial strain an appealing option for starch hydrolysis.

Conclusion

Amylases are abundant in cow dung. The response surface method was successfully used to produce amylases from B. cereus IND4 when cow dung substrate was used in SSF. Using a limited number of tests, statistical trial design is an efficient method for identifying critical factors and improving parameters for B. cereus IND4 amylase production. Cow dung may be an important substrate in enzyme bioprocesses due to its abundance and low cost.

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GEN-Z PERCEPTION OF MOBILE WALLETS

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ABSTRACT

With the development of telecommunication networks, the smartphone has become one of the basic essential elements of human life. Smartphones also playing a vital role in the development of social,economic, and human aspects. There are a lot of applications available on the smartphone to help human beings. The mobile wallet app is a key master to enter the era of this digital transactions and making payments. Mobile wallet payment has become one of the major important modes of digital transaction and most people adopted mobile wallet payments to make the payments. Especially this study is focused on the young generation (GEN-Z) perception ofthe mobile wallet. In this study around 101 respondents given their perception and opinion about mobile wallet payment. Apart from that other influencing factors to use the mobile wallet payment are easy bill payments, recorded the transaction history in the app itself, doing easy recharge, transferring the funds easily, and scan and pay. Making Payments through Mobile Wallets can be a great advantage to the customers.

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Keywords: Smart Phone, Mobile Wallet App, GEN-Z, Demonetization, Digital India.

Introduction

Digital India was launched by the Prime Minister of India Narendra Modi on 1 July 2015, with the objective of connecting rural areas with high-speed Internet networks and improving digital literacy. After implementing the digital India scheme, demonetization has a major impact on adopting the digital wallets payment system in India. The vision of the Digital India program is inclusive growth in areas of electronic services, products, manufacturing, and job opportunities. Today's world is absorbed with digital technology and developments, technology has a great impact on our lifestyle. mobile phones are becoming so advanced these days, it has made the life of human beings easier.A mobile wallet is the digital equivalent of a physical wallet. A place to store, organize and access a digital version of - payment and non-payment items on their mobile device. The Mobile Wallet trend was first begun in 2014 when Apple launched Apple Pay wallet. Soon after its successful adoption, competitors immediately built their own mobile wallets such as Android Pay, Samsung Pay, and Microsoft Wallet. Generation Z (or GEN-Z for short), colloquially known as zoomers. Researchers and popular media use the mid-to-late 1995s as starting birth years and the early 2010s as ending birth years. Nearly 13% of GEN-Z consumers say they either "definitely" or "probably" plan to use a "tap to pay" mobile wallet in 2021,while 32% say they're not sure. There are many mobile wallet apps like Google Pay, PayPal, Paytm, Freecharge, BHIM, etc.

Importance of the study

To achieve the economical growth of the country, the government considers the digital economy as the primary growth enabler. In India around 200 million internet users using the internet on their mobile phones, the mobile phone is inevitable in human life. A mobile wallet is an app that can be installed on the mobile phone itself so, relatively more people have started to use a mobile wallet. The main advantages of mobile wallets are easy accessibility, simple transfer of money, immediate - payments, enhanced security, gives gift vouchers, and cashbacks. Mobile wallet apps make it simple for transferring the funds like shopping/purchase of goods and services. Mobile wallet apps enable consumers to complete their transactions without using cash while protecting financial account information and passwords. By implementing digital payment methods (mobile wallet) the government can witness many advantages like the removal of black money, increase revenue, tax monitoring, accountable information, etc. It also needs to know that the GEN-Z using technology payments to complete their transactions. So, it is evident that compared to other generationsGEN-Zis a large number of consumers using mobile wallets in their day-to-day life.

Statement of the problem

In today's world, mobile phones have become an important part of life. The number of mobile phones has increased dramatically as it has become more affordable. This generation (GEN-Z) has grown up in a world with technology, connected with social networks using mobile phones or tablets. According to the Statista research department, In the financial year 2020, the penetration rate of smartphones in India reached 42 percent and was estimated to reach 51 percent in the financial year 2025. In November 2016, the government of India announced the demonetization of currencies which plays a major role in the usage of digital wallets. This research attempts to understand GEN-Z's perception of mobile wallets and the factors influencing the consumers to adopt mobile wallets.

Objectives

[1] To understand Generation Z's Perception Of Mobile Wallets.
[2] To analyze the factors influencing consumers to adopt different mobile wallets.

Scope of the study

The present study focuses on mobile wallet users in Bangalore city because around 40% of technological innovations are booming in Bangalore in India. Mobile wallet is a new technology for transferring funds, paying bills, etc. This study focuses on people who are using mobile wallets (age group between 18 to 25 years-GEN-Z). It is evident that GEN-Z was born into the technological innovation era in this globe. Thus, this research focuses on analyzing the GEN-Z perception of the mobile wallet payment system in Bangalore.

Literature review

Ms. Krupa A Rai et al. (2021) According to this research the main difference between a mobile wallet and online transactions through a bank account is that transactions through mobile wallets do not cost any extra charges whereas the banks charge some amount of money for all transactions made. To use a mobile wallet the user should create an account with a mobile service provider. The use of mobile wallets also saves the consumers from

entering card details and PIN for the transactions. The incredible usage of smartphones and internet service providers combined are the major attributes for the growth of usage of mobile wallets.

Mr. Prem Prakash Dewani (2021) As mentioned that mobile wallet is a member of the eco-payment system which enhances the national income reducing the operating cost, fraudulent activities. Most of the financial service providers are connected with telecommunication networks and developed payment app promoting brand recognition. Presently, the mobile wallet market is the key player in the global financial market like google pay, phone pay, pay pal, apple pay, and android pay. Since testing the market of money all times (MAT) in 2018 and the important decision to begin in the market and launch of BHIM app by the government.

Mr.Thirupathi M et al. (2021) have researched on accessibility and adaptability level of mobile wallets in the present scenario. An online survey was conducted for collecting the primary data from 203 respondents. The researcher has found that mobile wallet payment is a unique and massive advanced technology in this mobile world, so the researcher's main focus is on different mobile wallet payment and wallet users. In this research, the researcher has developed a conceptual model which is determining the factors influencing the mobile wallet payment. It also aims at existing technology acceptance models like TAM and UTAUT in the Indian scenario. In this research, the researcher introduces two additional factors namely economic factors and Government insisting factors to adapt the mobile wallet payment. Finally, the researcher has found that the Government insisting factors play a crucial role to adopt mobile wallet payment among the users.

Dr. Anju Singh and Ms. AanchalKalra (November 2020) This research provide a source for understanding consumer attitudes towards the usage of mobile wallets and the security issues faced by the consumers while using these wallets. In the present scenario, consumers are depending upon electronic cash rather than physical cash. Even though the digital revolution has increased the use of

mobile wallet or digital payment the security issues remains as an important concern for consumers of all age groups. This study explains security issues which include safety, trust, risk, privacy, financial security, security breach, data integrity. The researcher collected the data by issuing a structural questionnaire. Multiple regression and ANOVA have been used by the researcher to analyze the collected data.

Mr. Hoang ThiHau et al. (2020) The electronic payment system has gradually replaced traditional payment modes. The researchers through this study have investigated the factors influencing the intention of using digital wallets by the consumers. According to the researcher, this study consists of 5 independent variables namely, performance expectancy, effort expectancy, social influence, facilitating conditions, and perceived risks.

Mr.M.Thirupathi and G.Vinayagamoorthi (2020) have conducted a study on consumer's adoption of digital wallets among consumers. The researcher has adopted the Convenience sampling method to collect information from 100 respondents. According to this research mobile technology has become a vital part of human life in this world especially mobile technology has been growing widely among people as well as it will make consumer's life simple and comfortable. This research aims to analyze the mobile wallet payment adoption and its benefit to the consumers, it reveals that digital wallet payment makes it more comfortable for doing any payment in the present scenario.

M Thirupathi et al. (2019) According to this research, the researcher examined the impact of digital payment apps and their impact after demonetization. In this research, the researcher has found various dimensions of the cashless transaction after the demonetization in India. The researcher focus to analyze the economic development in India after implementing cashless payments this research identifies that the government of India insists people adopt cashless transaction and to eradicate the legal cash transaction which helps to achieve the economic growth in India.

Ms. Geetha. M. Iyer et al. (2018) The reserve bank of India and the government of India are taking many initiatives to promote financial inclusions of people. The setting up of payments banks is the latest initiative taken by the RBI. From this research, we can understand the viability of payment banks, the opportunities available for the people, and the challenges faced by the Indian population, belonging to various classes and segments. The researcher has collected data by the means of a closed-ended questionnaire. The researcher has used qualitative and quantitative methods for data analysis

Ms. Priyanka Tanwar (April 2017) This study enlightens the relationship between the digital economy, financial inclusions through digital India. The government of India has taken many initiatives and one of the ambitious initiatives launched by the government of India is "DIGITAL INDIA". According to this research, the main aim of this initiative is to ensure that the services provided by the government are available to all the citizens, in electronic form, by improving online infrastructure and increasing internet connectivity. The researcher has collected all the necessary details from different secondary sources like published reports of RBI, websites, newspapers, and journals.

Research Gap

The Above existing literature survey reveals that cashless payments and mobile wallet adoption in so many aspects like The adoption of mobile wallets in India, using mobile money platform (google pay, phone pay, etc.) to send and receive money, accessibility and adaptability level of mobile wallets by the consumers using TAM model, consumer attitudes towards the usage of mobile wallets and the security issues faced by the consumers while using these wallets, the factors influencing the intention of using digital wallets by the consumers, consumer's adoption towards digital wallets among consumers, the impact of digital payment apps and their impact after demonetization, the viability of payment banks, the opportunities available for the people, and the challenges faced by consumers, the relationship between the digital economy, financial inclusions through digital India. None of the above researchers focused on GEN-Z's perception of mobile wallet adoption and

payment system. So the researcher had an idea to study GEN-Z's perception of mobile wallets.

Research Design

Research methodology is the specific procedures or techniques used to identify, select, process, and analyze information about a topic. In this study, the researcher has used a descriptive research method to describe the GEN-Z perception of mobile wallets. In this research, the researcher has used the judgemental and snowball sampling method.

Data collection tools

Primary Data

The researcher has developed the questions to collect the data from respondents and all the questions have been converted into google forms and circulated google forms to mobile wallet users.

Secondary Data

The secondary data has been gathered from journals, articles, magazines, newspapers, and websites.

Data analysis & interpretation

Gender

Gender has a profound impact on behavior at work. Gender is particularly important in Indian studies,many researchers have proved that gender is a tendency to change behavioral things.

Table No-1: Gender of the Respondents

Gender	Frequency	Percentage
Female	70	69
Male	31	31
Total	101	100

Source: Primary Data

The above table and chart are representing the gender perspective of the mobile wallet users. More than two-thirds (69%) of respondents are females and a little less than one-third (31%) of the respondents are male. It is concluded that in this study most of the mobile wallet users are female only.

Age

Age is a vital factor in a human being's life because age determines the individual taste and preference. In the field of education, age is not a limiting factor because an individual is learning day-by-day, so it is a crucial factor for every teacher. Here an attempt has been made by the researcher to classify the age of the respondents.

Table No-2: Age of the Respondents

Age	Frequency	Percentage
18 Years	2	2
19 Years	6	5.9
20 Years	4	4
21 Years	27	26.7
22 Years	28	27.7
23 Years	10	9.9
24 Years	7	6.9
25 Years	12	11.9
26 Years	5	5
Total	101	100

Source: Primary Data

display the age of the mobile wallet users. It is found that more than one fourth (28%) of the respondents are belonging to 22 years, and little more than one fourth (27%) of the respondents are belonging to21 years, and more than one-tenth (12%) of the respondents are belonging to the age category of 25years, around (10%) are belonging into 23 years, and remaining 7%, 6%, 5%, 4%, 2% are belonging into the age category of 24years, 19years, 26years, 20years, and 18years respectively.

Educational Qualification

Education is changing human behavior and it can be treated as a manifestation of human life in the present scenario. Education is more important in the development era and education is much required to understand the technology.

Table No-3: Educational Qualification of the Respondents

Educational Qualification	Frequency	Percentage
PUC	6	6
UG	64	63.4
PG	31	30.7
Total	101	100

Source: Primary Data

The above table and pie chart depicts the educational qualification of mobile wallet users. less than two-third (63.4%) of the respondent's educational level is undergraduate (UG), and less than one-third (30.7%) of the respondent's educational level is post-graduate and the remaining 6% of the respondent's educational level is PUC. Therefore, most of the wallet users are well educated in this present scenario.

Table No-4: Number of Mobile Wallet Users

Number of MobileWallet Users	Frequency
Freecharge	5
Google pay	47
Paytm	40
Phonepe	77
BHIM	25

Source: Primary Data

The above graph reveals the number of mobile wallet users involved in this study. Around 77 customers are using the phonepe app out of 101 respondents, 47 customers are using the google pay app out of 101 respondents, 40 customers are using the Paytm app out of 101 respondents, around 25 customers are using the BHIM app out of 101 respondents, and 5 customers are using freecharge app out of 101 respondents. Hence, it is concluded in this study most of the customers are using phonepe apps in Bangalore city.

Table No-5:App Started Using from

App Started Using from	Frequency	Percent
After Demonetization	70	69.3
Before Demonetization	31	30.7
Total	101	100

Source: Primary Data

Most of the respondents (70%) are using mobile wallet payment after demonetization. It's presenting that demonetization has played a vital role to adopt mobile wallet payment.

Table No-6:Sources of Mobile Wallet

Sources of mobile wallets	Frequency	Percent
Banks	7	6.9
Family and friends	72	71.29
Government Initiatives	15	14.85
Retail shops	2	2
Super mart	5	4.95
Total	101	100

Source: Primary Data

It is evident from the data the different sources of mobile wallet to the customers; around 71.29% of the respondents are getting the source of mobile wallet from their family and friends, around 14.85% respondents are getting the source of mobile wallet from government initiative program, less than one-tenth (6.9%) of the respondents got the source of mobile wallet from the banks, and remaining 4.95% and 2% of the respondents got the source of mobile wallet from supermart and retail shops respectively.

Table No-7: Summary Table on Mobile Wallets Attributes

S.No	Attributes		BHIM	Free charge	Google pay	Paytm	Phonepe	Total
1	User Friendly	Nos	0	0	38	13	50	101
		%	0	0	37.6	12.9	49.5	100.0
2	Fast Payments	Nos	0	0	39	13	49	101
		%	0	0	38.6	12.9	48.5	100.0
3	Brand Loyalty	Nos	2	0	44	14	41	101
		%	2.0	0	43.6	13.9	40.6	100.0
4	Providing offer	Nos	1	1	54	16	29	101
		%	1.0	1.0	53.5	15.8	28.7	100.0
5	Discounts & Cashback	Nos	0	2	54	24	21	101
		%	0	2.0	53.5	23.8	20.8	100.0
6	Features of Mobile wallet	Nos	3	0	38	17	43	101
		%	3.0	0	37.6	16.8	42.6	100.0
7	More trustable wallet	Nos	1	0	44	10	46	101
		%	1.0	0	43.6	9.9	45.5	100.0
8	Safety/Security	Nos	2	1	44	11	43	101
		%	2.0	1.0	43.6	10.9	42.6	100.0
9	More Server problem	Nos	1	4	52	20	24	101
		%	1.0	4.0	51.5	19.8	23.8	100.0
10	Refund of the failed payment	Nos	1	3	37	25	35	101
		%	1.0	3.0	36.6	24.8	34.7	100.0

Source: Primary Data

Table No-8: Summary Table on Reasons for Using Mobile Wallet App

S.No	Attributes		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
1	To Adopt the Technology	Nos	1	5	11	39	45	101
		%	1.0	5.0	10.9	38.6	44.6	100.0
2	Any time 24X7 Availability	Nos	1	4	6	22	68	101
		%	1.0	4.0	5.9	21.8	67.3	100.0
3	Scan QR Code and pay	Nos	0	4	4	23	70	101
		%	0	4.0	4.0	22.8	69.3	100.0
4	Transaction history availability as a record	Nos	0	1	7	20	73	101
		%	0	1.0	6.9	19.8	72.3	100.0
5	Easy bill payments	Nos	0	2	10	15	74	101
		%	0	2.0	9.9	14.9	73.3	100.0
6	Easy recharge and other online payments	Nos	0	4	5	21	71	101
		%	0	4.0	5.0	20.8	70.3	100.0
7	Booking travel tickets & movie tickets	Nos	2	3	14	26	56	101
		%	2.0	3.0	13.9	25.7	55.4	100.0
8	Easy funds transfer	Nos	1	1	6	23	70	101
		%	1.0	1.0	5.9	22.8	69.3	100.0
9	Avoid carrying physical cash	Nos	1	2	10	22	66	101
		%	1.0	2.0	9.9	21.8	65.3	100.0
10	Avoid change currency issue	Nos	3	3	8	28	59	101
		%	3.0	3.0	7.9	27.7	58.4	100.0
11	Building Social image	Nos	6	8	21	29	37	101
		%	5.9	7.9	20.8	28.7	36.6	100.0
12	Availability of Unique feature	Nos	0	4	17	33	47	101
		%	0	4.0	16.8	32.7	46.5	100.0

Source: Primary Data

Finding suggestion and conclusions

Major findings

1. In this study, around 70 respondents are female out of 101 respondents. So, the majority of the respondents for this research female only

2. Most of the wallet users are well educated so it is found that education is required to use mobile wallet payment.

3. Most of the customers are using the phonepe app and following the google pay app, so at present most of the wallet users are giving preference only to phonepe and google pay app because of familiarity and better service of these apps.

4. The majority (71.2%) of the respondents received sources about mobile wallet payment through their family and friends.

5. The respondents believed the following mobile wallet attributes made the google pay app very familiar among the wallet users. Such attributes are; brand loyalty, providing an offer, discount and cashback, safety and security, and refund of failed payment.

6. The respondents believed the following attributes made the phonepe app very familiar among wallet users. Such attributes are; user-friendly, fast payments, features of mobile wallet, and most trustable wallet.

7. out of 101 respondents, 52 respondents are telling that more server problems are happening in the google pay app and followed by phonepe, Paytm, freecharge and BHIM.

8. The main reasons for using mobile wallet app by the respondents have strongly agreed on the following attributes as; making the payment anytime 24*7, using QR code scan to make payments, the transaction details are recorded in the app itself, paying all the bill payments and doing recharge, booking the tickets, easy transfer of funds, avoid carrying cash and help to avoid the remaining change issues with the payees.

Suggestion

1. To make Freecharge and BHIM apps familiar among the wallet users in Bangalore city compared with other wallets.

2. The source provided by the bank and government initiatives regarding mobile wallets has been improved to the public.

3. Even though 32 customers are using BHIM and Freecharge app, they are not satisfied with the features available in these apps. Hence, both the applications have to concentrate on the features of the mobile wallet compared with other competitive wallet apps.

4. The Paytm application should concentrate on safety and security and other features as followed by google pay and phonepe app to gain more trust from the customers.

5. In google pay the server problem is more repeated while doing the transactions, it affects the customers financially as well as mentally. So, they have to concentrate on server-related issues for providing better service to their customers.

Conclusions

Due to the pandemic situation (covid-19), the government suggested the public go for the digital transaction instead of paying cash. In this situation, the cashless transaction mode has become very familiar among the people in their day-to-day transactions. especially GEN-Zis more likely to access the technology.As per the study, mobile Wallet is gaining popularity among GEN-Z such as the age group of the people between 18 to 25 years of students and employees. Further, the study also explored which mobile wallet gateway service is preferred by the consumers. The study witnessed that mobile wallet payment is leading among the other wallet providers. The major reasons for using mobile wallet payment to doeasy bill payments, recorded the transaction history in the app itself, doing easy recharge, transferring the funds easily, and scan and pay. Making Payments through Mobile Wallets can be a great advantage to the customers.

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IMPACT OF COVID-19 ON EMPLOYEE BEHAVIOUR: STRESS MECHANISM DURING WORK FROM HOME

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ABSTRACT

The emergence of new technologies has revolutionized working patterns, enabling work from anywhere for many employees. The extensive availability of technology has enabled location and timing of work to be undertaken with significant flexibility, offering benefits to employers and employees.Due to covid-19 most of the employees are worked from home, during the time employees has faced few issues, which affects the behavior. This study focused about employee behaviors and its impact during the work from home, around 100 respondents are involved and given their opinion about WFH advantage and disadvantages.

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Keywords: Employee's, Behavioural changes, Mental and Physical health, Work from Home

Introduction

At the beginning of 2020, Covid- 19, a novel coronavirus had vigorously spread around the world and was declared as 'Pandemic' on march 11th 2020 by WHO. The virus first emerged in China and is now considered as one of the major global health threats. By 30th Jan 2020, the virus had spread to 147 countries and affected hundreds and thousands of people in a short time. The deadly virus has strongly influenced the people by increasing fear, frustration, stress and anxiety. It is documented that pandemic have huge impact. This Covid-19 pandemic has created a crisis in all aspects of our lives. The working environment has been significantly changed with thousands of jobs lost and women impacted at higher rates than men. For those employed in sectors able to work remotely, mostly white-collar professional workers, their homes have now become their workplace, school, and place for relaxation. As economies begin to reopen with resumption of some normal activities, questions arise about the potential return to formal office environments and the implications for employees whilst COVID-19 remains active in the community. Many organizations will continue mandating working at home (WAH) for the foreseeable future to avoid making COVID-19 regulation related changes to their office environments.

However, to date there is no universally accepted definition of telework. The Internatihonal LabourOrganization (ILO) defines telework as the use of information and communications technologies (ICTs) including smartphones, tablets, laptops or desktop computers for work that is performed outside the employer's premises. A range of positive benefits are associated with teleworking, including improved family and work integration, reductions in fatigue and improved productivity. However, the blurring of physical and organizational boundaries between work and home can also negatively impact an individual's mental and physical health due to extended hours, lack of or unclear delineation between work and home, and limited support from organizations. The mandatory WAH situation is complex and requires a systematic examination to identify the impact of organizational, physical, environmental and psychosocial factors on individuals' mental and physical health.

The ongoing need for containment of COVID-19 and continued need to undertake WAH requires evidence synthesis to develop policies and guidelines to protect employees' health and well-being. Undertook a rapid review of the evidence on the impact of WAH on individual workers' mental and physical health. In addition, examined any gender differences of these impacts. Considered the body of evidence to develop recommendations for employers to optimize the health of their employees.

Given the gravity of the intractable crisis, countermeasures by a single entity are rarely effective. Since COVID-19 has impacted people globally, strict and internationally applicable regulations have been enforced. Amidst a situation with unknown mechanisms of action, societies have deployed safety protocols of physical distancing and mobility

reduction through lockdown, as immediate countermeasures to reduce the rate of virus spread. Lockdown is considered an emergency protocol that restricts an individual's movement. People must not leave a given area (usually their home) except for procuring essential supplies. All public places are shut down, non-essential activities discontinued, and travel by air, rail, and buses remain suspended during this period (Economic Times, 2020). The aim of the lockdown is isolation i.e., the separation of people who have been diagnosed with a contagious disease from people who are not sick **(Brooks et al., 2020).**

Businesses were least prepared for a black swan event such as the current pandemic which lead to a sudden and complete closure of offices worldwide. To survive the upcoming economic crisis, most organizations (where possible) required their employees to work from home. This practical business continuity response is described by the situational theory **(Felstead, Jewson, Phizacklea, & Walters, 2002)** wherein organizations react and respond to the pressures of the immediate situation. While under normal circumstances work from home was an option provided by employers to few employees, the COVID-19 lockdown left work from home as the only viable option for organizations to survive.

Review of Literature

Shepherd-Banigan (2016), Telecommuting may be associated with negative effects such as psychological and physical isolation as it dramatically limits workers opportunities for direct contact and interaction. Psychological isolation "is a feeling that one is disconnected from others, lacking desired social and influential network connections, and that the need for support, understanding, and other social and emotional aspects of interaction are not fulfilled". Failing to meet this need can lead to negative consequences such as depression, anxiety, and psychological isolation. Physically isolated telecommuters tend to feel frustrated and untrusted, prone to loneliness. They also have a lower sense of 'belonging' and organizational identification and may find it impossible to maintain meaningful relationships with co-workers **(Shepherd-Banigan et al., 2016).**

CIPD (2016), Working from home is known as a form of flexible working due to the fact that it provides employees with an opportunity to work flexibly in order to carry out their job roles within their working environment, this can include when they work, such as, the working hours and also where they work such as the work environment.

According to CIPD (2016) flexible working has been introduced into organizations as a way for employees and employers to have flexibility within their job roles therefore allowing them to suit their personal needs. This type of flexible working can be defined as mobile working, allowing employees and employers to work elsewhere outside of the office for either all or part of their working week.

Canonico (2016), A study carried out by **Canonico (2016)** outlined that working from home can negatively affect organizational performance which in turn may impact on the overall culture within the organization. This study also outlined how this way of working may increase tension levels due to a shift in the variation of culture climates.

James (2016), also concludes that working from home involves many challenges with the biggest challenge being that it can be extremely hard to retain the motivation to work as it is a struggle to retain the ability to be self-disciplined and self-driven to complete work tasks, when working remotely with little support from co-located work colleagues or management. There is no indication here as to what way the employee is affected by these challenges.

Timsal and Awais (2016), believes that organizations are currently finding different ways to develop and retain their employees and that currently, potential candidates are attracted to organisations that have flexibility throughout the workplace.

Manjunath M. K &Dr. T.P Renukamurthy (2017), their study finds most of the bank employees are under stress because of rapid changes in their work like technological changes, customer response, and service for customers, which leads to stress towards the employees. Thus, workforce stressor has become the critical problem affecting towards the work performance as well as the organization productivity. The study was

mainly on the secondary source that is with the help of online journals, articles and data from magazines etc. Finally, they have conclude stress will improve the psychological well-being of the employees, but effective performance of the employees are most important for the success of the banking industry.

Kim (2018), The differences in risk of work-family conflicts also regard the income sphere: low-income telecommuters, in general, tend to have less control and more limited schedule options than mid- and high- income workers. This may reduce their ability to coordinate work and family demands, thereby removing the possible benefits of telecommuting arrangements.

Dey (2020), Telecommuting is an increasingly viable option for many organisations around the world and primarily enabled through the proliferation of enabling technologies. These include high-speed internet, management software, messenger communication systems and computing hardware that is increasingly prevalent in our homes and, through smartphones, our pockets. During the COVID-19 pandemic, the resilience of some organisations was allowed through technology-supported telecommuting, which serves to showcase its potential. Nevertheless, while acting as a great enabler, the uptake of telecommuting also rests on various factors.

Wang (2020), found that teleworkers experienced a more positive sense of well-being and fewer job-related adverse effects on well-being. This varied by personality type, with individuals expressing more 'openness' to the idea of WFH being more likely to report positive outcomes. Importantly, strong social networks beyond work seem to be linked to higher levels of positive effects, indicating that the sense of 'physical isolation' from the working environment can be compensated by maintaining a strong social network. Additionally, WFH may provide tangible benefits of increased family time, especially for new mothers through a reduction of commutes and more time available to spend with children at home **(Wang et al., 2020).**

Van der Lippe and Lippenyi (2020), who investigated the effect of WFH on co-workers, found that individual employees performed better when their colleagues did not telecommute. The above, once more, suggests that the extent of telecommuting appears to be consequential for the functioning of the individual employee. When comparing members of a team, the study of Van der Lippe and Lippenyi (2020) found that individual employees telecommuting from home had a lower job performance compared to other workers on the same team. Besides, telecommuting was found to have a negative effect not only on the telecommuter but the co-workers who might be working from the office. However, these findings are strongly dependent on the telecommuting arrangements and the intensity of telecommuting.

Statement of the Problem

During covid-19, most of the employees generally facing technical issues, virtual communication barriers, financial problem, family interruption during working hours and also facing work pressure all these problems made them, for this adopting the proper distribution network channels and taking regular breaks and relaxation activities to avoid the stress. This shows how they manage their work and complete their task and avoid their stress.

Scope of the Study

The study is under taken on the work from home employees in Bangalore. It focuses on employee behaviour and stress mechanism during work from home due to covid-19. It focuses on IT and ITES, Professionals etc.

Objectives of the Study

- ➢ To study the various impact of the employee's behaviour during the Covid-19.
- ➢ To analysis the challenge faced by the employees during covid-19.
- ➢ To identify the causes of stress to the employees during work from home.

Research Methodology

The techniques or specific procedure which helps the researcher to identify, choose, process and analyse information about the topic is called research methodology. It may be understood as a science of studying how

research is done scientifically. It allows the reader to evaluate the validity and reliability. In simple words, it describes what you did and what made you reach this obtain result.

Sampling Design

The questionnaire was issued to collect data from all the respondents. The researcher adopted convenient sampling method for obtaining the information. Under convenient sampling method, data were collected from 100 respondents of the population, which is to complete set of items, which are of interest in any particular situation. The results obtained from convenient sampling method are likely to be more representative, accurate and reliable.

Method of Data Collection

Primary Data:

a) Primary data are the first-hand information, which are obtained by the study specifically designed to fulfil the data needs of the problem to handle. They are original in character. The source of primary data is the respondents.

b) Primary data was collected from the employees through structured questionnaire

Secondary Data

Secondary data are those, which have been already discovered by others. It is the data collected for some purpose other than the problem at handle. Before starting the study, the researcher read the existing literature and learnt what is already known of the general area in which the specific problem falls. The employee behaviour and stress mechanism during WFH relevant materials and the company website are the sources of the secondary data.

Data Analysis

FLUCTUATION IN SALARY PROVIDING BY ORGANISATION DURING COVID

The fluctuation in salary providing by organization, it leads to the growth in inequality created by Covid-19 crisis the threatens a legacy of poverty and social economic instability that would be devastating.

GRAPH-1: Fluctuation in Salary Providing by Organization
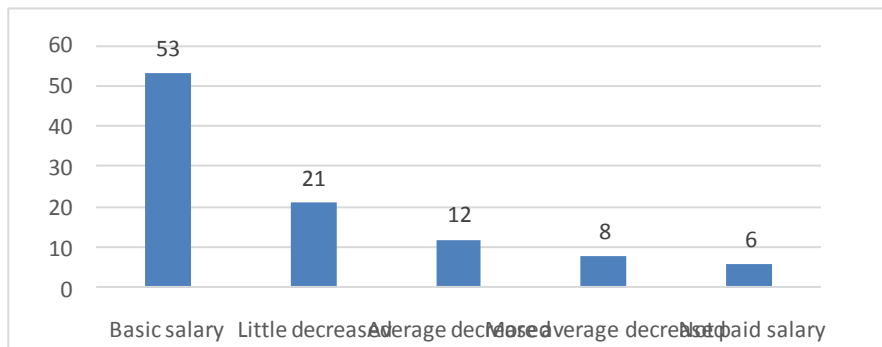
INTERPRETATION

From the above table 8, it is analyzed that out 100 respondents 53 respondents have stated that they were getting basic salary during Covid-19, 21 of them face little decrease in salary, 12 of them face average decrease in salary, 8 of them face salary fluctuation that is

more average decrease in salary, 6 of them face not paid salary due to Covid-19 pandemic. From the above graph, it interprets that the majority 53% respondents have stated that they were getting basic salary while work from home during Covid-19.

Table No-1

Particulars		Very Rarely	Rarely	Occasionally	Frequently	Very Frequently	Total
Are You Getting Support from Organization	No	15	26	24	28	7	100
	%	15.00	26.00	24.00	28.00	7.00	100.00
Faced Insecurity on Job Due to Covid-19	No	48	16	23	9	4	100
	%	48.00	16.00	23.00	9.00	4.00	100.00
Faced Any Financial Problem During Covid-19	No	9	31	21	29	10	100
	%	9.00	31.00	21.00	29.00	10.00	100.00

Faced Communication Barrier During WFH	No	22	37	14	23	4	100
	%	22.00	37.00	14.00	23.00	4.00	100.00
Faced Work Pressure During WFH	No	14	31	15	31	9	100
	%	14.00	31.00	15.00	31.00	9.00	100.00
Differentiation in Doing Job in Office And WFH	No	23	24	21	24	8	100
	%	23.00	24.00	21.00	24.00	8.00	100.00
Get Any Family Interruption During WFH	No	24	28	26	15	7	100
	%	24.00	28.00	26.00	15.00	7.00	100.00
Technical Issues While Work from Home	No	7	31	33	15	14	100
	%	7.00	31.00	33.00	15.00	14.00	100.00

The above table reveals that that out 100 respondents 28% respondents have stated that they getting frequently support from organization while working from home in order to complete the task.

it is analyzed that out 100 respondents 48 respondents have stated that they did not face any insecurity on job during Covid-19 pandemic. it mentioned that around 31% respondents have stated that they were rarely face financial problem due to covid pandemic time.it is analyzed that out 100 respondents 37 respondents have stated that they have rarely face communication barrier during working from home. It explains that 31% respondents have stated that they have rarely face work pressure during working from home, 31 of them sometimes face work pressure during working at home.it interprets that the majority

24% and 24% respondents have stated that they were rarely and sometimes find differentiation in doing job in office and working from home. it analyzed that out 100 respondents 28 respondents have stated that they have get rarely family interruption during working from home, it interprets that the majority 33% respondents have stated that they were sometimes face technical issues during working from home.

FACED ANY OF THE FOLLOWING SYMPTOMS OF STRESS

Symptoms may include irritability, difficulty sleeping or relaxing, headaches and muscle tension. Stress management approaches include lifestyle changes, relaxation and mindfulness and counselling.

PARTICULARS		NO. OF RESPONDENTS	PERCENTAGE
Symptoms of Stress	Headache	36	36.00
	Aggressive	13	13.00
	Conflict with others	11	11.00
	Difficulty in decision making	14	14.00
	Changes in attitude	8	8.00
	Lack of interest	10	10.00
	Irritable	8	8.00
	Total	100	100.00
The Relaxation Activities Taking at The Time of WFH	Listening music	40	40.00
	Videos	13	13.00
	Games	21	21.00

	Exercise	13	13.00
	Other activities	13	13.00
	Total	100	100.00
Taking Regular Breaks During Work Hours	Half an hour	27	27.00
	45 minutes	32	32.00
	1 hour	36	36.00
	None	5	5.00
	Total	100	100.00

Findings

➢ The majority of the respondents (28%) were frequently getting proper support from organization for completing the work during covid-19.

➢ The majority of the respondents 48% were never face any insecurity on their job due to covid-19.

➢ Out of total respondents 53% were organization providing basic salary where fluctuation in salary during covid-19 pandemic.

➢ 31% of respondents were rarely faced financial problem during covid-19.

➢ The majority of the respondents 37% were rarely faced communication barriers with their management during work from home.

➢ Out of the total respondents 31% rarely and 31% sometimes were faced work pressure during work from home.

➢ Respondents 24% rarely and 24% sometimes were find differentiation in doing job in office and work from home.

➢ Out of total respondents 28% rarely were get family interruption during work from home.

➢ The majority of the 33% respondents were faced technical issues while work from home.

➢ The majority of the 36% respondents were faced the headache symptoms of stress.

➢ Out of the total respondents 40% were listening music as a relaxing activity taking at the time of work from home.

➢ 36% of the respondents were taking 1hour regular break due to avoid the stress.

➢ The majority of the respondents 60% were doing day shift as a working routine.

➢ Out of the total respondents 48% were agree with employees are working isolation to avoid the covid-19.

➢ 40% of the respondents were agree with the workers remain obligated to comply with all company rules practices and instructions.

➢ The majority of the 79% respondents were yes. It shows they were able to complete task on a time bound basis during work from home.

➢ The majority of the respondents 69% were yes. It shows they were proper equipment to fulfill role to their usual standard.

➢ Out of total 51% respondents were agreed with practicing work life balance, staying active and connect.

➢ 38% of respondents were learn new job skills during working from home.

Suggestions

• During covid-19 pandemic time, many organizations adopted the WHF, the employees facing technical issues during their working hours, this problem can be overcome by adopting proper distribution network channels.

• WFH creates communication barrier between management and employees, without proper communication the employees cannot complete the task which is assign, so the regular communicating with employees can identify their problems and take necessary action.

- During pandemic time, all over the countries citizens are facing the financial problem and also facing the fear of insecurity in their jobs.
- While providing proper basic salary to their employees without fluctuation in salary and also taking care of employee's family by providing basic needy requirements.
- Work pressure is one of the factors facing by employees during WFH and it leads to stress.
- It can be solved by adopting the work life balance, taking regular breaks, spending time with family and relaxation activities to avoid the stress symptoms such as headache, aggressive, irritable, conflict with others etc.

Conclusions

Although the COVID-19 lockdowns in various countries offered a unique opportunity to test the feasibility of telecommuting, the latter had been already becoming increasingly prevalent, with the respective arrangements differing vastly and, if properly managed, yielding various organisational and employee benefits. Nonetheless, gender, income must be accounted when establishing WFH policies to ensure equal opportunities and respect of individual circumstances and preferences. Employees, in general, enjoy more flexible working hours than their commuting counterparts, especially when their outputs are goal-oriented. A sense of control and flexibility to work schedules is conducive to positive experiences of WFH employees' outcomes.

However, setting boundaries remains an integral part of WFH arrangements, and positive outcomes of employees can only be ensured with the establishment of clear work-life boundaries which limit the negative consequences of spill over of work into home-time and minimise work-family conflicts. The physical isolation does not have to mean psychosocial isolation. The latter can be mediated through strong relationships both at work and beyond. Efforts to reduce feelings of social isolation can lead to significant improvements in mental health indices for high sensitivity groups, especially older age groups and women.

Overall Work from Home employees should not be taken for granted and explicit guidelines and effective management along with technological amenities with back-ups and proper workspace set up at home are essential to yield benefits from organization. Guidelines for Work from Home must be set up and adhered to by both the employees and the organisation. Managers must respect their employees and ensure their inclusion in the structure of the organisation. Effective communication between employees and managers/supervisors, with the use of proper ICT platforms amongst other means, can ensure optimal work performance and build trust, while mutually agreed boundary settings and WFH arrangements are key to effective and productive employees' performance and behaviour.

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INTEGRATION OF ICT IN MATHEMATICS: BENEFITS AND CHALLENGES

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ABSTRACT

Information and Communication Technology (ICT) is considered as the backbone of 21st century.It has important place in all subjects of school. ICT plays a critical role in developing 21st century skills in learners. It has immense potential for developing higher order skills in learners and transforming pedagogical practices.Integration of ICT has numerous benefits, but teachers are still struggling with challengesin integrating ICT with their subjects for better achievement of learners.This research paper reviews literature onhow teachers are integrating ICT in Mathematics at school level. The study is also exploring the type of ICT resources used by the teachers and the factors affecting integration of ICT in Mathematics teaching.

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Keywords: *ICT, Integration of ICT, Teaching of Mathematics.*

Introduction

In this digital era, technology has replaced the traditional methods of teaching with modern ICT resources and facilities. The pandemic situation eventually forced the education system to adopt technology for teaching-learning process during lockdown. Teachers are required to integrate ICT in their teaching-learning process. The use of technology helps in improving the quality of teaching-learning process.It also helps in managing and getting information anytime and anywhere, enhance creativity of learners and promotes learners' independence in studies (Rosnaini Mahmud &MohdArif, 2008). ICT support the learners in developing required competencies and skills, and motivates the learners (Ghavifekr et. al, 2014).The National Educational Policy (NEP) 2020,advocates integration of technology in teaching-learning process of all subjects.Technology is also essential for teaching-learning process of Mathematics (Ittigson&Zewe, 2003). The rapid growth of technological resources has provided opportunity to change the nature of teaching and learning of Mathematics. Over the past decades, ICT has considerable impact on teaching-learning process of Mathematics (Blume &Heid, 2008; Clements, Bishop, Keitel, Kilpatrick, & Leung, 2013; Drijvers, Barzel, Maschietto, &Trouche, 2006; Heid& Blume, 2008; Hoyles& Lagrange, 2010, Drijvers, et al. 2016). The integration of ICT in mathematics makesit more effective as well as enhance the learners' capabilities in understanding mathematicalconcepts (Keong, et. al. 2005).

Information and communication technology (ICT)

"*Information and communication technology (ICT) has become a basic building block of modern society*" (Daniels, 2002). Many countries across the world consider it as the core subject of education just like reading, writing and numeracy. These days, it has become the strongest factor that shapes the educational landscape (Johnson, et. al., 2016).Technology was not widely used for educational instruction till the end of 20th century. ICT gain popularity only in the decade of 1990s with computer communication and information access especially using internet-based services like e-mail, CD-ROM and World Wide Web (WWW) which interest the educators to use technology for improve student learning. Vyas and Nirban (2014) stated that the reasons for non-use of technology was the high cost and requirement of skilled technician. Therefore, Radio and Television were the means of reaching to masses as well as for educational process. In the last few decades, availability and utilization of ICT has improved with use of computers, laptops and internet (Vyas and Nirban 2014). Therefore, the use of computers in education was considered as the first stage, which further helped in the adoption of the idea of e-learning (Vyas &Nirban, 2014). Now a days, digitalized technologies like personal computers, laptops, World Wide Web, CD-ROM, video-

conferencing, digital libraries, digital apps are constantly and quickly evolving. Many resources like video clips, audios, visual presentation are available on the internet which makes knowledge acquisition effortless (Fu, 2013). According to Rana (n.d.), ICT includes all technologies as depicted in the image.
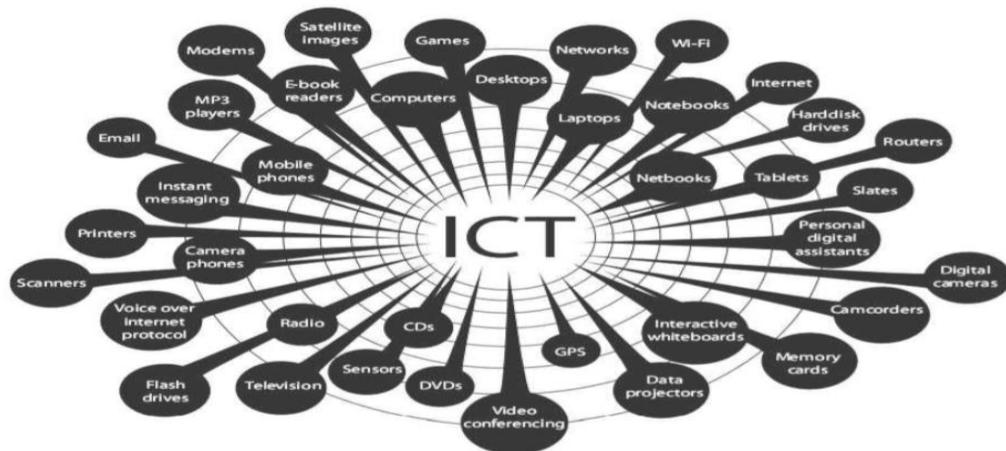
Source: Rana (n.d.), ICT (I see it) in Math education

Condie& Munro (2007) mentioned the growing use of mobile technologies and laptops, which support various educational activities and it's usefulness in management and administration. Some of the latest technologies used today are Open Educational Resources (OER), Massive Open Online Course (MOOC), Free and Open-Source Software (FOSS) which assist various stakeholders to professionally grow and helps in career advancement.

ICT is most commonly integrated with curriculum to enhance the learning level and achievement. These days ICT integration in pedagogy is emerging and growing phenomenon.

Integration of ICT in Mathematics

ICT integration refers to the use of technology for teaching subject matter in the classroom (Rosnaini Mahmud &MohdArif, 2008).Jackson (2017) emphasised that a teacher has a very important role in technology classroom because a teacher has to decide when, where, how and which ICT resources to be used in the classroom. According to Jackson (2017), only presence of technology won't ensure improvement in learners' outcomes. Mishra and Koehler (2006) gave micro model of ICT integration known as TPACK which includes three elements Pedagogical Knowledge (PK), Content Knowledge (CK)and Technical Knowledge (TK). This model advocates that the teachers who have all the three types of

knowledge can innovate their pedagogy and practice, and support their learners in better understanding of concepts. The technology assist teachers in addressing various problems related to teaching and learning. It makes the transection of curriculum easier andinteresting for learners. Moseley, et el. (1999) conducted an ICT based study for developing numeracy skill at primary level. The result revealed that ICT has improved the attainment level of students in Mathematics. Sheila (2016) studied about the level of ICT integration in Mathematics and concluded that levels of ICT integration in Mathematics is low and teachers are not well prepared to integrate ICT in Mathematics teaching-learning process.

Teachers use different ICT resources in Mathematics like multimedia, virtual manipulatives, interactive whiteboard and Mathematics specific software. Multimedia resources like videos, animation, interesting movies help learners to understand mathematicalconcepts easily and develop important skill of problem solving, logical thinking and reasoning.Learners enjoy learning with ICT resources almost all concepts like arithmetic, algebra,geometry and statistics. Interactive visuals provide opportunities for learners to see and interact with abstract Mathematical concepts. They learn while exploring with games, digital tools and stimulation.

Benefits and challenges of ICT integration in Mathematics

Integration of ICT in Mathematics has many benefits for both the teachers and students. Though, it demands change in existing teaching practice on the part of teacher. Use of ICT in Mathematics requires appropriate knowledge and skills. ICT provides dynamic opportunities for teaching-learning process of Mathematics. It enhances the learning process and make it more interactive and engaging.Using ICT, learners' develops conceptualunderstanding, problem solving and critical thinking in Mathematics. Learner's develop their own strategies using ICT and solve Mathematical problems. ICT connects Mathematics with the real world. In the time of pandemic, ICT became an important tool for facilitatingcommunication. Learner's interact with each other using online platform like Google Meet, Zoom, Skype, Hangouts etc.

Teachers are also facing difficulties in using ICT resources, especially in using Mathematics specific software. Usually, teachers lack the knowledge related to ICT and how to integrate it in teaching-learning of Mathematics. Some other challenges include lack of access to ICT resources, confidence, time and effective training.

Factors affecting the integration of ICTin Mathematics

Many researches show that the level of ICT integration in classrooms is quitedisappointing. There are a number of factors that influence integration of ICT inteaching and learning. Researchers have categorized these factors in many ways like internal and external and factors related to teacher, school and technology.Tezci(2011a) cited in Fu (2013) summarized the factor influencing the use of ICT and identified two types of factors external and internal. The external factors include availability of technology, accessibility of ICT equipment, administrative and technical support, school curriculum, culture and climate, time constraints, faculty workload, result pressure etc. and the internal factors include knowledge, understanding and readiness to use ICT; belief, perception and attitude towards ICT; self-confidence, motivation and self-efficacy. Chen (2008) cited the most common external factors which influence ICT use are lack of access to computers and software, lack of technical and administrative support and inadequate time whereas the internal factors can be summarized as teachers' belief and teachers improper and limited understanding about theoretical and practical use of ICT. Agnes &Wallace (n.d.)concluded that insufficient ICT training, lack of freedom to access the laboratories, inadequate technical support and insufficient equipment/ devices in the laboratories made the environment unconducive to learning.Kaleli-Yilmaz (2015) studied the factors affecting integration of technology in Mathematics. The study classified factors into four categories as teacher-based, student-based, content-method-source-time-management related and other technicalreasons. The finding of the study indicated that these factors have significant effect on ICT integration in Mathematics:

- Students and teachers' knowledge of technology and usage capability.
- Students and teachers' attitude towards technology and willingness to use technology.
- Technological pedagogical content knowledge of teachers.
- Apprehension.
- Hectic curriculum schedule, insufficient time for completing course, and examination system.

Conclusion

ICT plays a very critical role in developing 21st century skills in learners. The use of technology helps in improving the quality of teaching-learning process. Therefore, teachers are required to integrate ICT in their teaching. The use of technology helps in improving the quality of teaching-learning process. Not only technology has important place in modern classroom but a teacher is also important because only ateacher has to decide how to integrate ICT into the classroom which ultimately leads to improve or hinder learning. Teacher's understanding about technology, content and pedagogy helps her to integrate ICT better.There are many factors which influence integration of ICT like availability of

technology, accessibility of ICT equipment, administrative and technical support, school curriculum, culture and climate, time constraints, faculty workload, result pressure.

And theteachers related factors include knowledge, perception, attitude, belief,understanding, readiness to use ICT, self-confidence, motivation and self-efficacy.

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