Volume 10, Issue 4 (III)
October - December 2023
ISSN: 2394 – 7780

International Journal of Advance and Innovative Research

Indian Academicians and Researchers Association
www.iaraedu.com

International Journal of Advance and Innovative Research

Volume 10, Issue 4 (III): October - December 2023

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International Journal of Advance & Innovative Research
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International Journal of Advance and Innovative Research

Volume 10, Issue 4 (III): October - December 2023

CONTENTS

Research Papers

International Journal of Advance and Innovative Research
Volume 10, Issue 4 (III): October - December, 2023
ISSN 2394 - 7780

SEGMENTING STUDENTS FOR CHOICE OF UNDERGRADUATE PROGRAMS BASED ON THEIR SOCIAL MEDIA USAGE: CLUSTER ANALYSIS

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ABSTRACT
Social media is becoming increasingly important as a tool for communication, marketing, and social interaction. A rising number of companies across numerous industries now use social networking apps in their marketing plans or plan to do so. Social media's potential as a tool for marketing is drawing more universities' attention. It is extremely important that these technologies be able to reach and draw in potential pupils. An essential topic for the study is figuring out how prospective students utilize social media and how it affects their decision on a field of study, a school, or a college.

In this study, market divisions of prospective students are identified based on their social media usage, and influence of social media on their decision regarding a higher education program and institution is also looked at. The results of a segmentation study of undergraduate students who were considering graduate schools based on their social media usage are presented in this paper. A well-structured questionnaire administered to Mumbai City's undergraduate students allowed for the collection of data. One thousand questionnaires were sent. Finally, 716 questionnaires were used for final analysis after rejecting incomplete questionnaires. . K means cluster analysis methodology was employed to identify market segments. The investigation has revealed three distinct segments, each of which may be distinguished by their preferences for social media activities such as information search, online word-of-mouth, social interaction, attitude toward social media advertising, and program preference.

The study found the three distinct segments viz. Reluctant, Impressionable, and Information seekers. Information seekers have emerged as a significant segment for educational institutions. This article offers insights into how university marketers might use social media platforms to promote their courses among students. The survey came to the further conclusion that the majority of students, or information seekers, are more interested in getting information from the college's alumni and current students than from the material posted on its social media platforms. The paper recommends that education institutes should make efforts to satisfy their existing and pass out students who have a significant influence on students seeking admission in the colleges.

Keywords: Market Segmentation, Social Media usage, Cluster Analysis, Undergraduate Programs

1. INTRODUCTION
The term "social media," which is used to characterize a broad range of new internet applications, has sparked debate and commercial interest. Human behavior has been discovered to be significantly impacted by social media. Kolbitsch & Maurer (2006); Barker, V. (2009). The previous studies (For eg. (Augustsson, 2010; Kabilan, Ahmad, & Abidin, 2010; Constantinides & Fountain, 2008; Ghauri, Lutz, & Tesfom, 2003; Kim, Jeong, & Lee, 2010; Mangold & Faulds, 2009; Spaulding, 2010) focuses on the usage of social media but a few of the studies have been conducted on segmenting the students based on their social media usage in the context of seeking admission in UG Courses.

In the area of marketing for higher education, social media marketing offers a lot of potential. (Gibbs, 2002; Helgesen, 2008; Hemsley- Brown & Oplatka, 2006) Colleges frequently employ it as a student recruitment technique. Social media has a positive impact on the young generations and has high adoption rates by the young generations (Boyd, 2008).

Social media marketing could result in providing better information to the students and help them in choosing the university and colleges wisely.

2. LITERATURE REVIEW
Discovering the variables that affect how consumers perceive advertising is of increasing relevance to marketers. There are three primary reasons why people watch commercials: to get information, have fun, and express themselves socially. These motives may have an effect on how they feel about advertising. In 2011 (Bamoriya and Singh). People use social media for social interaction, information seeking, entertainment, relaxation, pass time, communication, convenience, expression of opinion, information sharing, and surveillance/knowledge of others, according to research by Whiting and Williams (Whiting and Williams, 2013).

ISSN 2394 - 7780

Previous studies have shown that consumers use advertising primarily for three purposes: information seeking, amusement, and social expression (Eadie et al. 2007, Gordon 2006, and Couler et al. 2001). Advertising helps people obtain crucial information that they need to make informed judgments about their purchases.

According to Carvalho et al. (2020), word-of-mouth has a positive impact on raising the Brand Equity of higher education institutions. Perera et al. (2019) also found that in order to decide whether to enroll, prospective students are increasingly accessing social media to learn more about higher education institutions (HEIs) and solicit advice from others. In their 2018 study, Al Halbusi and Tehseen found that Malaysian consumers' decisions on car brands were significantly influenced by EWOM. Practitioners are urged to evaluate the quality, reliability, and applicability of the online reviews' opinions as a supplement to their marketing efforts to boost the number of online reviews for their products.

There is evidence from numerous research that inadvertent exposure affects brand choice. Furthermore, research suggest that the type of social media exposure has little impact on brand preference for low-involvement product categories. They are found to be the main influencer in product categories with high levels of involvement.

The higher education industry has made numerous strides thanks to the growing usage of social media, most notably in branding initiatives. The students interact and communicate their passion for their preferred colleges on social media (Chugh and Ruhi, 2018).

Internet networking has gained in importance relative to interpersonal relationships. The distinctions between online and offline advertising, as well as their importance in the current environment, are crucial concepts to grasp, according to the writers.

Goyal (2016) asserts that a brand's online appeal, usage, reach, and dependability/trust all have a significant impact on the purchase decision of a consumer.

Attitude is important while choosing a brand. Subrato (2018) asserts that many changes in the customer's selection decision are influenced by their mindset prior to the serving of advertisements. Affective conditioning and straightforward exposure-based advertising techniques have been shown by Bake et al. (2013) to have a direct impact on brand preference.

3. RESEARCH OBJECTIVE

The objective of the research is to segment the Undergraduate Students for choosing UGprograms and colleges.

4. LIMITATIONS AND FUTURE SCOPE OF THE STUDY

The present study is limited to Mumbai City and undergraduate Students only. The study maybe extended to PAN India to get clear pictures of these segments.

5. RESEARCH METHODOLOGY

Data was gathered by administering a thoughtful questionnaire to Mumbai City's undergraduate students. One thousand questionnaires were sent. Finally, 716 questionnaires were used for final analysis after rejecting incomplete questionnaires. K means cluster analysis methodology was employed to identify market segments. The investigation has revealed three distinct segments, each of which may be distinguished by their preferences for social media activities such as information search, online word-of-mouth, social interaction, attitude toward social media advertising , and program preference.

6. CLUSTER ANALYSIS

In his examination of the early segmentation literature, Wind (1978) notes that researchers have either chosen to base their inquiries on an a priori separation of individuals (usually based on a single differentiating attribute) or an empirical particular focus on cluster analysis. Early examples of market segmentation by cluster analysis appear to be expanding more quickly than the empirical data. Punj and Stewart (1983) produced several clarifications on this subject to clear up any misconceptionsof guidelines for the effective use of cluster analysis Dibb and Stern (1995) raise ongoing worriesabout the dependability of cluster-based segmentation and suggest that researchers must guaranteethat their technique is appropriate

In the study described in this paper, segments of UG students were identified using a two-step cluster analysis based on the method described by Mooi and Sarstedt (2011). In the initial stage, a hierarchical cluster strategy utilizing Ward's distance measurement (Antonenko & Niederhauser, 2012) was applied to comprehend how the dataset was partitioned. The relative distance between each potential cluster solution and how the sample can be divided can both be seen on the dendrogram. In the second stage, the final clusters elucidating the market segmentation are found using K-means analysis (Hartigan and Wong, 1979). This paper's segmentation is primarily based on consumer preferences.

ISSN 2394 - 7780

7. FINDINGS AND DISCUSSION

Demographic Profile of the Respondents

Table 1 provides a breakdown of the respondents' demographic characteristics. Male and female population ratios are equal, as can be observed. Additionally, the majority of answers are in the 18 to 23 age range.

Table1: Demographic Profile of the respondents

Gender	**Frequencies**	**Percentage (%)**
Male	316	44.1
Female	400	55.9
Total	716	100
Age	**Frequencies**	**Percentage (%)**
less than 18	54	7.5
18-23	655	91.5
24-30	7	1
Total	716	100

Market Segmentation Description

This section goes into detail about the market segments that the cluster analysis identified. Each of the five segments that were discovered has a name, which is given in Table 1 along with the relative size of each segment to aid with comprehension.

Table 1: Number of Cases in each Cluster

Cluster	1	44.000
	2	234.000
	3	438.000
Total		716.000

Table 1 shows that Cluster 3 comprised the majority of the responses. i.e. 438(61%) followed by 234 (33%) in Cluster2 and 44 (6%) in Cluster 1. The characteristics of each of the clusters are discussed as under:

Cluster 1: Reluctant

Most of the respondents who belong to Cluster1 were found to be reluctant towards the use of social media in choosing UG programs. They do have not any particular concern for choosing thecourses and comparing them on social media. Further, they were not interested in trending and courses on social media and it was also found that they didn't have any influence on the Brandingof the colleges. They were even not interested in seeking information for the various courses and also they have not interacted with other students on social media platforms regarding admissions in various UG programs in colleges. However, these segments constitute only 6% of the respondents surveyed.

Cluster 2: Impressionable

In this cluster, it was shown that the respondents were concerned about the numerous remarks made by students on the social media platform and were impacted by electronic word-of-mouth. It was also discovered that social media had a major influence on the respondents' decisions about colleges and course offerings. However, they were neutral regarding the opinion of already enrolled students, alumni, and facultyof the colleges for seeking admission in various courses.

Cluster 3: Information seeker

The vast majority of the responders belong to Cluster 3. The user in this cluster was discovered to be essentially unconcerned about how social media was used to choose the UG program and College. Regarding the impact of the information and online word of mouth shared on social media platforms, they were unprejudiced. However, they were found to get aware of the various colleges and interested in placement activities and making interaction with the enrolled students and alumni for seeking admission.

IMPLICATIONS AND DISCUSSION

The number of information searchers has grown significantly for educational institutions. This article offers insights into how university marketers might use social media platforms to promote their courses among students. Additionally, the study found that the majority of pupils viz. information seekers are more engaged in seeking information from the alumni and students of the college rather than the content available on the social

ISSN 2394 - 7780

media platform of the colleges. The paper recommends that education institutes should focus on their existing students and their alumni as they have a significant influence on students seeking admission in the colleges.The Alumni portal and groups should be developed by colleges to have continuous interaction between the college and their pass-out students. Further, colleges also focus on their current students by providing them with excellent education and placement so that they can influence thestudents who are seeking admission in colleges and courses.

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ISSN 2394 - 7780

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International Journal of Advance and Innovative Research
Volume 10, Issue 4 (III): October - December, 2023
ISSN 2394 - 7780

LEVEL OF AWARENESS IN UNDER GRADUATE STUDENTS ON ENVIRONMENTAL HAZARDS

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ABSTRACT

Background:
In International Encyclopedia of the Social and Behavioural Sciences, 2001, D. Liverman defines, Environmental hazards as extreme events or substances in the earth and its ecological system.

Most of the Environmental hazards have adverse effects either directly or indirectly on human health and environmental pollutants can cause serious health problems like respiratory diseases, heart diseases and various types of cancer. For us human beings, who are an integral part of the ecosystem, its crucial to have awareness on the environmental hazards. Many of these hazards affect young people who have to live with the deteriorating environment. The objective is to assess the level of awareness on environmental hazards in students.

Methodology:
A questionnaire in Google form is used to collect the required data..

Null Hypothesis:
There is no significant difference in the level of awareness on environmental hazards in students who study the subject Environmental Science in their curriculum and those who do not.

Alternative Hypothesis:
There is significant difference in the level of awareness on environmental hazards in students who study the subject Environmental Science in their curriculum and those who do not.

The aim is to assess whether studying the subject as a part of their curriculum increases their level of awareness.

Keywords: Environmental Hazards, Environmental Awareness, Non-Communicative Diseases (NCD)

1.1 INTRODUCTION:

A news release by the World Health Organization (WHO) in 2016 states, an estimated 12.6 million deaths each year are attributable to unhealthy environments. Environmental risk factors, such as air, water and soil pollution, chemical exposures, climate change, and ultraviolet radiation, contribute to more than 100 diseases and injuries. An environmental hazard affects the planet, different ecosystems, flora and fauna of the ecosystem, human beings and has inimical effects on human health in an unconceivable way. WHO has identified five key results[1] from the study on the impact of environmental risk factors on death and disease globally. viz.,1. Environmental risks account for a large fraction of the global burden of disease 2. Environmental impacts on health are uneven across life course and gender 3.Low- and middle-income countries bear the greatest share of environmental disease 4.Total environmental deaths are unchanged since 2002, but show a strong shift to non-communicable diseases5. The evidence on quantitative links between health and environment has increased. The health of children under five, and to a lesser extent up to 10, and that of adults between 50 and 75 years is most affected by the environment. In children, the environment's contribution to infectious and parasitic diseases, neonatal and nutritional diseases and injuries is very prominent. The last decade has seen a shift away from infectious, parasitic and nutritional diseases to NCDs, not only in terms of the environmental fraction but also the total burden. This shift is mainly due to a global decline of infectious disease rates, and a reduction in the environmental risks causing infectious diseases, i.e. a higher share of people having access to safe water and sanitation, and a lower share of households using solid fuels for cooking. In terms of the total disease burden, NCDs have increased globally. From the above key results it is perspicuous that children and senior citizens are more vulnerable to environmental hazards and these hazards are ubiquitous giving rise to many issues which pose some serious threats and challenges that require immediate attention and in the coming decades. A paradigm shift is required as far as environmental hazards are concerned. As a response to these complex environmental challenges, a first and foremost step is to increase the level of awareness in young minds for which the assessment of present level becomes a crucial aspect.

ISSN 2394 - 7780

1.2 LITERATURE REVIEW

The following literature review was done in relevance to the research.

- Subrata Bachhar and Bijan Sarkar(2016) in their study " Awareness of Environmental Pollution among Secondary Level Learners in Nadia District, West Bengal" have tried to compare the level of awareness between male and female and also urban and rural higher secondary students. They found out that there was no significant difference in the awareness of rural and urban students towards environmental pollution. But, the awareness level scores were significantly higher in case of rural students.
- Daniel raja, R. conducted a research "A Study of Environmental Awareness of Students at Higher Secondary Level" The study was carried out with a sample of 180 students from Standard XII using environmental awareness scale for assessing the significance difference in the mean scores of environmental awareness. The results indicated that there was a significant difference in the mean scores of Environmental awareness between the students belonging to science group and arts group, there existed significant difference in the mean scores of Environmental awareness between the students belonging to science group and vocational group, there existed no significant difference in the mean scores of Environmental awareness between the students belonging to vocational group and arts group.

1.3 RESEARCH DESIGN

1.3.1 Objective

The objective of the research was to assess and compare the level of awareness of environmental pollution of students who study the subject Environmental Science in their curriculum and those who do not.

1.3.2 Null Hypothesis

Based on the objective of the research, following null hypotheses were framed:

H01: There is no significant difference in the level of awareness on environmental hazards in students who study the subject Environmental Science in their curriculum and those who do not.

H02: There is no significant difference in the level of awareness on environmental hazards between female (male) students who study the subject Environmental Science in their curriculum and those who do not.

H03: There is no significant difference between the student's perception of their level of awareness and the actual level of awareness they have.

1.3.3 Sampling Design and Data Collection

A comparative study design was used to assess the awareness on environmental hazards between two groups.

Group1: Students who did not have EVS in their curriculum and **Group2**: Students who had EVS in their curriculum. The primary data was collected through structured questionnaire in Google form, The questions on basic environmental hazards were framed to assess the level of awareness and to capture the perceptions of students on environmental pollution and its impact on human beings. A sample size of 94 students were taken for study out of which 59 students had the subject EVS in their curriculum and 35 students did not have the subject EVS in their curriculum.

1.3.4 Statistical Analysis

The software, Microsoft Excel was used for data analysis. Likert scale questions in the questionnaire was converted to quantitative data using excel code book .The independent(unpaired) samples 't' test[1] was used to check whether there is any significant difference in the level of awareness between

(i) Students who studied EVS in their curriculum and those who did not

(ii) Female students who studied EVS in their curriculum and those who did not

(iii) Male students who studied EVS in their curriculum and those who did not

[1] The Independent Samples t Test compares the means of two independent groups in order to determine whether there is statistical evidence that the associated population means are significantly different. The Independent Samples t Test is a parametric test.

ISSN 2394 - 7780

The dependent (paired) samples t test was used to check whether there is any significant difference between the student's perception of their level of awareness and the actual level of awareness they have.

1.4 ANALYSIS & INTERPRETATION

Table1.4.1: Statistical Analysis on the level of awareness of students of the two groups

Level of Awareness			
Group 1(Did not have EVS in the curriculum)		**Group 2(Had EVS in the curriculum)**	
Mean	7.885714286	Mean	7.838983
Standard Error	0.199090067	Standard Error	0.166043
Median	8	Median	8.25
Mode	9	Mode	8.5
Standard Deviation	1.17783272	Standard Deviation	1.275399
Sample Variance	1.387289916	Sample Variance	1.626644
Kurtosis	0.370379467	Kurtosis	1.107773
Skewness	-0.80648491	Skewness	-1.16581
Sample Size	35	Sample Size	59

- To test the first null hypothesis H01, independent (unpaired) sample't' test(two tailed with unequal variance) was used and the 'p' value obtained was 0.857427187146862 which is greater than 0.05.This implies that Null hypothesis is accepted. i.e., there is no significant difference in the level of awareness between the students who study the subject EVS in their curriculum and those who do not study the subject in the curriculum.

Table1.4.2: Statistical Analysis on the level of awareness of female/male students of the two groups

Category	Statistical Analysis	Group 1(Did not have EVS)	Group 2(Had EVS)	p-value
Female	Mean	3.138889	3.03871	p=0.5302
	Standard Error	0.118856	0.104385	
	Median	3.2	3.1	
	Mode	3.2	3.4	
	Standard Deviation	0.504263	0.581193	
	Sample Variance	0.254281	0.337785	
	Kurtosis	1.409776	0.430746	
	Skewness	-1.06233	-0.98276	
	Sample Size	18	31	
Male	Mean	3.17222222222222	3.24444444444444	p=0.5798
	Standard Error	0.102519105681697	0.0786882002494623	
	Median	3.25	3.4	
	Mode	3.6	3.4	
	Standard Deviation	0.434951728972251	0.408875882364668	
	Sample Variance	0.189183006535951	0.167179487179486	
	Kurtosis	-0.891317063255254	0.736517840340252	
	Skewness	-0.497500817887245	-1.05732057595418	
	Sample Size	18	27	

- To test the second null hypothesis H02, independent (unpaired) sample 't' test(two tailed with unequal variance) was used and the 'p' value(for female) obtained was 0.5302 which is greater than 0.05 and the p-value (for male) obtained was p=0.5798 which is also greater than 0,05. This implies that Null hypothesis is accepted. i.e., there is no significant difference in the level of awareness between the female(/male) students who study the subject EVS in their curriculum and those who do not study the subject in the curriculum.

Table1.4.2: Analysis on the student's rating on their awareness and their actual awareness

	Count	Sum	Average	Variance
Student's rating on their awareness	94	639	6.797872	4.614619
Actual Awareness	94	738.5	7.856383	1.522163

ISSN 2394 - 7780

ANOVA- Two-Factor Without Replication						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**F critical**
Rows	312.3816	93	3.358942	1.209192	0.18068	1.408995
Columns	52.6609	1	52.6609	18.9575	3.43E-05	3.943409
Error	258.3391	93	2.77784			
Total	623.3816	187				

- To test the third hypothesis H03, two-way ANOVA without replication was used. There is significant difference between student's perception of their level of awareness and the actual level of awareness. The students have more awareness than their perception of their level of awareness.

1.6 CONCLUSION

The average level of awareness of the students on basic environmental hazards is significantly good. There was no difference in the level of awareness between the students who study the subject EVS in the curriculum and those who do not. Also the study revealed there was no difference in the level of awareness based on gender and the students have more level of awareness than what they thik,they actually have. With an exemplary awareness youth must be engaged in activities on environmental awareness and empowered more to protect the environment.

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International Journal of Advance and Innovative Research
Volume 10, Issue 4 (III): October - December, 2023
ISSN 2394 - 7780

USAGE OF PLASTIC AND ITS IMPACT ON HEALTH AND ENVIRONMENT

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ABSTRACT

Plastic pollution has not only jeopardized the environment but also human health of current and future generations. The entire globe is facing a crisis which is plastic pollution. This crisis is found all around the world. Usage of plastic is adversely affecting the humans and the environment at each stage of their lifecycle. It is detrimental to the environment and humans at the stage of production, manufacturing, usage, recycling and disposal. The negative effects are felt in wide range of areas like biodiversity, climate change, human health and human rights. This research paper will focus on impact of plastics and the chemicals they contain on human beings.

Human beings are exposed to various toxic chemicals and microplastics by way of ingestion, inhalation and direct skin contact. According to the world-wide fund for nature on an average a person consumes 5gms of plastic every week. Though this a relatively naïve area of research, it has been proved that plastic causes diseases, disability and premature death at every stage of life cycle. The chemical additives and pollutants found in plastic are toxic in nature and pose a major threat to human health on a global scale. A few scientifically proven effects of plastics usage include cancer, endocrine disruption which results in reproductive, growth and cognitive impairment. It has also been observed that microplastics act as vessels for pathogens to enter our system, increasing the spread of the disease.

Human health is adversely affected all along the plastic value chain. Adverse impact on human health is observed at extraction sites, exposure of chemicals to workers, air pollution due to incarnation of waste and water and soil contamination. Plastics crisis is raising concerns of human rights and environmental injustice. It has detrimental effects on children, women, workers in informal waste sector and vulnerable communities.

Global Plastic Crisis

The entire would is exposed to plastic pollution. Since 1950s around 8.3 billion tons of plastic is produced, out of which 79% of the plastic has ended in landfills or leaked into environment. Plastic waste is found from the Marina trench to Mt. Everest. There is no place on Earth which is saved from plastic crisis. It is ubiquitous in the environment and we are moving towards Anthropocene era.

Production Of Plastic

Plastic pollution is spreading exponentially over a past decade growing from 1.5 million metric tons (MT) in 1950 to an astonishing 392 million metric tons 2022. The production of plastic is further expected to rise in coming decades as investment in petrochemical infrastructure has an upward trend. The rise in plastic production is linked to continued reliance on fossil fuels.

Very few environmentalists are coming forward to reduce the impact of plastic pollution. Considering the magnitude of plastic pollution, it is important to create awareness among general public about the consequences of plastic pollution and ways to reduce the usage wherever alternative is available.

Covid 19 and Plastic Pollution

The battle against plastic pollution was adversely affected due to Covid 19 pandemic. Usage of disposable masks, gloves and other protective instruments soared. If we implement effective measures the amount of plastic discarded every year can be drastically cut or even eliminated. This would require significant changes in the environmental policies and awareness.

Exposure to Plastic

Humans are exposed to plastic through daily life products, medical supplies as well as through the food chain and airborne plastic pollution. Workers involved in extraction and transportation, Refining and manufacture end up getting exposed to the plastic pollution by way of inhalation, ingestion and skin contact. Normal human beings also suffer due to inhalation, ingestion and skin contact due to usage of plastic products or consume products wrapped in plastic; microplastics in the air etc. Due to waste management and plastic recycling large amount of toxic chemicals are released in the environment. Recent studies have shown microplastics in human blood, lungs and placenta.

Impact of Plastic Pollution on Biodiversity

Plastic pollution has posed a significant threat to biodiversity considering its toxic nature. It is impeding ecosystem, animals and plant's ability to deliver essential services to the humanity. Marine life is in severe

ISSN 2394 - 7780

danger due to leakages of plastics in into oceans. Plastic pollution has affected freshwater and terrestrial ecosystem.

Environmental degradation takes place at each stage of plastic lifecycle. Plastic life cycle is responsible for releasing toxic chemicals and contaminating environment. Burning plastic waste releases toxic chemicals, micro and nano plastics into the air while landfills pollute soil and water.

Plastic and Global Trade

Plastic has a significant impact on global trade, both as a commodity and as a source of pollution.

Plastic Production: Plastic is one of the most commonly produced materials in the world, and its production has significant economic implications for countries that produce and export it. According to the United Nations, the global plastics industry is worth over $400 billion annually, with China, Europe, and the United States being the largest producers and consumers of plastic. The production of plastic involves the extraction and processing of fossil fuels, which can have environmental and social impacts on the communities where these resources are extracted.

Plastic Trade: Plastic is also a significant commodity in global trade, with countries importing and exporting plastic products, raw materials, and waste. For example, many developed countries export their plastic waste to developing countries for processing and disposal. This has led to concerns about environmental and social impacts in countries that receive this waste, as well as ethical issues related to the treatment of workers who are employed in the plastic waste industry.

Packaging: Plastic is widely used in packaging, particularly in the food and beverage industry, which has significant implications for global trade. For example, the use of plastic packaging can increase the shelf life of products and reduce the costs of transportation, which can facilitate global trade. However, the use of plastic packaging has also led to concerns about plastic pollution and its impacts on the environment and human health.

Environmental Impacts: Plastic pollution can have significant environmental impacts, which can affect trade relations between countries. For example, plastic pollution in oceans can harm marine ecosystems and fisheries, which can impact trade in seafood products. Additionally, concerns about plastic pollution can lead to the implementation of environmental regulations and trade restrictions, which can affect the movement of plastic products and waste between countries.

There is growing interest in transitioning to a circular economy for plastics, which aims to reduce the amount of plastic waste produced and increase the amount of plastic that is recycled and reused. This has significant implications for global trade, as it involves the development of new technologies, infrastructure, and markets for recycled plastic products.

Overall, plastic has a significant impact on global trade, both as a commodity and as a source of pollution. Addressing the social, economic, and environmental impacts of plastic will require a multi-faceted approach that engages all stakeholders, including governments, businesses, and civil society organizations.

Plastics Waste Management and Recycling

Plastic waste management and recycling are important issues in addressing plastic pollution and its associated impacts. The management of plastic waste involves the collection, transportation, and disposal of plastic waste. In many countries, particularly in developing countries, plastic waste management is inadequate, leading to significant environmental and health impacts. Plastic waste can end up in oceans, rivers, and other bodies of water, harming marine life and ecosystems. Additionally, plastic waste can contribute to air and water pollution, which can have serious health impacts on local communities.

Recycling is the process of turning plastic waste into new products. Recycling is an important component of plastic waste management because it helps to reduce the amount of plastic waste that ends up in landfills, oceans, and other bodies of water. The plastic recycling process involves collecting and sorting plastic waste, cleaning and processing it, and transforming it into new products such as bottles, bags, and other plastic items. However, not all plastic waste can be recycled, and the recycling process can be energy-intensive and costly.

Types of Plastics: Not all plastics are created equal when it comes to recycling. Plastics are classified based on their resin identification code, which is a number from 1 to 7 that indicates the type of plastic. Some types of plastics, such as PET (polyethylene terephthalate) and HDPE (high-density polyethylene), are more commonly recycled, while others, such as PVC (polyvinyl chloride), are more difficult to recycle.

There are several challenges to effectively managing and recycling plastic waste. These include inadequate waste management infrastructure, limited public awareness and education on plastic pollution and recycling,

ISSN 2394 - 7780

and a lack of incentives for companies to design products that are easier to recycle. Additionally, the costs of recycling can be higher than the costs of producing new plastic, which can make it difficult for recycling to be economically viable.

Addressing plastic waste management and recycling requires a comprehensive approach that involves reducing the amount of plastic waste produced, improving waste management infrastructure, promoting recycling, and encouraging sustainable design and production practices. This can include policies and regulations that incentivize companies to design products that are easier to recycle, as well as public education campaigns to raise awareness of plastic pollution and the importance of recycling.

Overall, plastic waste management and recycling are important issues in addressing plastic pollution. Effective solutions will require a multi-faceted approach that addresses the social, economic, and environmental factors that contribute to plastic waste and pollution.

Achieving a **green economy** without plastic will require a concerted effort from governments, businesses, and individuals to reduce plastic consumption and promote alternative materials and practices. Here are some strategies for achieving a green economy without plastic:

Reduce Plastic Consumption: The first step in achieving a green economy without plastic is to reduce the amount of plastic consumed. This can be done by implementing policies and regulations that limit the production and use of plastic products, such as single-use plastic bags, straws, and packaging. Additionally, businesses can adopt sustainable design practices that prioritize the use of biodegradable or reusable materials, while individuals can make a conscious effort to reduce their own plastic consumption.

Promote Alternative Materials: In order to replace plastic products, it is necessary to develop and promote alternative materials that are more sustainable and environmentally friendly. These can include materials such as paper, glass, metal, and bioplastics, which are derived from renewable resources and can be recycled or biodegraded. Governments can support the development of these materials by investing in research and development, while businesses can explore new opportunities for sustainable product design.

Build Sustainable Infrastructure: Achieving a green economy without plastic also requires the development of sustainable infrastructure for waste management and recycling. This can include investing in waste collection and recycling facilities, as well as developing systems for composting and organic waste management. Governments can support these efforts by providing funding and incentives for sustainable infrastructure projects, while businesses can adopt sustainable supply chain practices that prioritize the use of recyclable materials and closed-loop systems.

Educate and Raise Awareness: Education and awareness-raising campaigns are also critical in achieving a green economy without plastic. This can involve educating individuals and businesses on the environmental impacts of plastic pollution, as well as promoting the benefits of sustainable materials and practices. Governments can support these efforts by implementing public education campaigns and providing incentives for businesses that adopt sustainable practices.

Foster Collaboration and Partnership: Achieving a green economy without plastic requires collaboration and partnership among all stakeholders, including governments, businesses, civil society organizations, and individuals. This can involve working together to develop and implement policies and initiatives that promote sustainable materials and practices, as well as sharing knowledge and resources to support sustainable development.

Overall, achieving a green economy without plastic requires a multi-faceted approach that addresses the social, economic, and environmental factors that contribute to plastic consumption and pollution. By reducing plastic consumption, promoting alternative materials, building sustainable infrastructure, educating and raising awareness, and fostering collaboration and partnership, we can create a more sustainable and environmentally friendly future.

Impact of Plastic on Agriculture:

Increase in crop yields: Plastic is commonly used in agriculture to create greenhouses, which provide a controlled environment for growing crops. Greenhouses can protect crops from pests, extreme weather conditions, and diseases, allowing farmers to extend the growing season and increase their yields. Plastic films can also be used to cover soil and reduce evaporation, increasing moisture retention and improving plant growth.

ISSN 2394 - 7780

Reduced water usage: Drip irrigation systems made from plastic are increasingly being used in agriculture to reduce water usage. These systems deliver water directly to the roots of plants, reducing water loss due to evaporation and runoff. This can be particularly beneficial in areas with limited water resources, where water conservation is a major concern.

Protection from pests: Plastic covers can be used to protect crops from pests and harsh weather conditions. For example, plastic tunnels or row covers can be used to protect crops from insects, birds, and wind damage. This can reduce the need for chemical pesticides and other treatments, which can be harmful to the environment.

Soil contamination: Plastic waste can accumulate in soil, reducing its fertility and ability to support crop growth. When plastic degrades, it can release harmful chemicals into the soil, including phthalates and bisphenol A (BPA), which can affect plant growth and pose health risks to humans and animals. Plastic waste can also block the flow of water and nutrients through soil, reducing crop yields and affecting soil health.

Damage to wildlife: Plastic waste can harm wildlife, including birds and marine life. Plastic bags and other debris can be mistaken for food by animals, leading to choking, suffocation, and other injuries. In addition, plastic waste can disrupt ecosystems and reduce biodiversity, as animals are forced to adapt to changes in their environment.

Health risks: The chemicals used in plastic production can potentially contaminate food and water sources, posing health risks to both humans and animals. For example, plasticizers like phthalates and BPA can leach into food and water, potentially causing hormonal imbalances and other health problems. Plastic waste can also release toxic chemicals into the environment, affecting the health of nearby communities and ecosystems.

Overall, while plastic can provide some benefits to agriculture, its negative impacts on the environment and potential health risks should also be considered. It's important to manage plastic waste effectively to minimize its impact on agriculture and the environment. This can include measures like reducing plastic use, improving recycling and waste management systems, and developing new, more sustainable materials for use in agriculture.

Biodegradable Plastics

Biodegradable plastics are a type of plastic that can decompose naturally through the action of microorganisms, such as bacteria, fungi, or algae. Unlike traditional plastics, which can persist in the environment for hundreds or thousands of years, biodegradable plastics break down relatively quickly and do not accumulate in the environment.

There are two main types of biodegradable plastics: those that are made from renewable resources and those that are made from fossil fuels. Bioplastics made from renewable resources, such as corn starch, sugarcane, and potato starch, are often marketed as a more sustainable alternative to traditional plastics, as they are derived from renewable sources and can be composted or recycled.

However, it is important to note that not all biodegradable plastics are created equal, and some may not break down as quickly or completely as others. Additionally, the conditions under which biodegradable plastics are disposed of can have a significant impact on their ability to decompose. For example, if biodegradable plastics are disposed of in a landfill, where oxygen is limited, they may not decompose as quickly as they would in a composting facility.

It is also worth noting that while biodegradable plastics may break down more quickly than traditional plastics, they still have environmental impacts. For example, the production of biodegradable plastics may require significant amounts of energy and resources, and they may still release harmful chemicals into the environment as they break down.

Overall, while biodegradable plastics may offer some benefits over traditional plastics, it is important to carefully consider their environmental impact and to properly dispose of them in order to minimize their environmental

The global market size of biodegradable plastics has been growing rapidly in recent years as consumers and businesses become more interested in sustainable and eco-friendly products. According to a report by Grand View Research, the global biodegradable plastics market was valued at USD 3.4 billion in 2020 and is expected to reach USD 9.2 billion by 2027, growing at a compound annual growth rate (CAGR) of 14.0% from 2020 to 2027.

ISSN 2394 - 7780

The demand for biodegradable plastics is being driven by factors such as increasing environmental concerns, growing awareness about the negative impact of traditional plastics on the environment, and government regulations promoting the use of sustainable materials. Biodegradable plastics are being used in a variety of applications, including packaging, agriculture, textiles, consumer goods, and automotive industries.

Geographically, the Asia-Pacific region is the largest market for biodegradable plastics, accounting for over 40% of the global market share in 2020. The region's dominance is due to factors such as the high population density, increasing demand for eco-friendly products, and government initiatives to reduce plastic waste. North America and Europe are also significant markets for biodegradable plastics, with a growing trend towards sustainable products and stricter regulations on plastic waste.

Overall, the biodegradable plastics market is expected to continue to grow in the coming years, driven by increasing environmental concerns and a shift towards sustainable and eco-friendly products.

CONCLUSION

There are several different plastic life cycle approaches that are used to understand the environmental impact of plastic products. This will help us to prevent the damage leading towards extinction of living species on the planet.

Life Cycle Assessment (LCA): This approach assesses the environmental impact of a product or material throughout its entire life cycle, from raw material extraction to disposal. It considers factors such as energy use, greenhouse gas emissions, water use, and waste generation.

Cradle-to-Cradle (C2C): This approach is based on the idea that products should be designed to be reused, recycled, or biodegraded at the end of their useful life. It involves considering the entire life cycle of a product, from its initial design to its eventual disposal, with a focus on creating a closed loop system where waste is minimized.

Extended Producer Responsibility (EPR): This approach holds manufacturers responsible for the environmental impact of their products throughout their life cycle. This can include implementing recycling programs, reducing the amount of waste generated by the product, and designing products to be more easily recyclable.

Circular Economy: This approach aims to create a closed loop system where resources are used and reused in a circular way, rather than being discarded after use. This involves designing products with the end of life in mind, and ensuring that materials can be easily recycled or biodegraded.

Overall, these approaches are all aimed at reducing the environmental impact of plastic products by considering their entire life cycle, from raw material extraction to disposal

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International Journal of Advance and Innovative Research
Volume 10, Issue 4 (III): October - December, 2023
ISSN 2394 - 7780

FOOD QUALITY - FOOD FOR THOUGHT FOR A BETTER WORLD

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ABSTRACT
Hippocrates, the father of medicines famously quotes "Let food be thy medicine and medicine be thy food". *Though thousands of years old, this quote stresses the importance of healthy eating and how the nutrients in various foods have healing properties. A healthy lifestyle with good nutrition is fundamental for maintaining good health and disease prevention.*

A wholesome diet includes eating and drinking enough of the right foods to provide your body with the nutrients needed to function properly and maintain health. Some diets boost disease, such as hypertension, high cholesterol, and other heart issues, and increase the probability of obesity, diabetes, and cancer. Other diets reduce the risk for these diseases. Research shows that eating a mostly plant-based diet can keep the body free of certain diseases, reverse many diseases and aid in the prevention of or reduce the risk of cancers.

A plant-based diet consists mainly of vegetables, whole grains, pulses, fruits, nuts, and seeds. Twenty percent of the diet could contain fish and chicken and minimal low-fat dairy products. These foods provide the body with health curing vitamins, minerals, proteins, healthy fats, and fiber.

A plant-based diet even though contains nutrients and vitamins, it can be easily contaminated. Contamination can either be intentional or unintentional. Scientific evidence has shown that contamination of food is a serious issue which causes Infections, the most common contagious medical problem in today's times. Food contamination has economic effects at all levels of society. Diseases caused by consuming contaminated food results in the need for hospital care or self-care on an individual and group level.

There is limited understanding of disease and deaths from all food-safety related issues.

Keywords: food quality, food healthiness, healthy diet, food contamination.

INTRODUCTION
"Good Food, Good Life" the power of food to enhance lives, is the proof of a superior consumers awareness of the importance of health and wellness and looking good which has prioritized one's health more after the onset of the pandemic.

The demand for high quality food has constantly increased during recent decades, as has the interest in the food quality issue. The consumer of the 21st Century is a highly demanding one, exhibiting greater concern about quality and health benefits with respect to products he/she buys.

Quality of food is important for both human health and the environment. Food quality is a central issue in today's food economics, and the last few decades prove that consumers concerns for healthier lifestyles and environment care are driving forces for restructuring food buying intentions and their perspectives on food quality.

Based on the premise that food quality is formed by the perceptions held by consumers, one important key to the understanding of the food quality evaluation is the discovery of the signs used by consumers in this process.

This understanding of consumers perceptions of food quality is highly relevant because their buying decisions depend on these. The differences in food quality perceptions appear over time and places. This complex and dynamic character of food quality requires a constant investigation to capture as much as possible its current meaning.

Consumers often rely on labels which display ingredients, expiration date, health information, and environmental attributes when they assess the food quality attributes.

Food Quality
Food quality includes safety, appropriateness, and economic worth. Food and components have chemical, physical, and microbiological qualities. Taste, aroma, appearance, and nutritional value can also determine food quality.

ISSN 2394 - 7780

Food standards also depend on producers eliminating infections and other dangers through food safety practises. Highly processed snack foods, sugar sweetened beverages, refined grains, refined sugar, fried foods, saturated and trans fats, and high-glycaemic foods are low-quality.

Food quality is a measure of the safety, nutritional value, and sensory appeal of food.

Safe food lacks hazardous ingredients. Bacteria, viruses, parasites, poisons, and toxins are harmful. Food safety prevents foodborne illness, which can include diarrhoea, vomiting, nausea, and fever. Foodborne disease is dangerous for young children, the elderly, and those with compromised immune systems.

Nutrient content is nutritional value. The body needs nutrients. Vitamins, minerals, carbs, protein, fat, and water. A nutritious diet keeps the body healthy.

Sensory appeal is how food looks, smells, tastes, and feels. Sensory appeal makes meals enjoyable. Attractive food encourages eating, which can improve health.

Taste, fragrance, sight, and texture make food appealing. These variables generate an overall perception of the food, which can affect our decision to consume it. Many elements affect food's sensory attractiveness. Understanding each component helps us make more appealing, tasty dishes.

Healthy Diet

Food quality impacts health. It also boosts health. Our health depends on food quality. A nutritious diet promotes lifespan, excellent health, and disease prevention. Nutritional value, additives, and processing affect food quality. Food quality depends largely on nutrition. Our bodies need vitamins, minerals, fibre, and protein, which a balanced diet should give.

Malnutrition and chronic lifestyle diseases like obesity, heart disease, and diabetes can result from eating too many processed foods and not enough fruits, vegetables, and complete grains.

Food Preservatives

Food chemicals and preservatives can also harm us. Food preservatives prevent microbial deterioration. They inhibit microorganisms and extend food shelf life. These compounds increase taste, texture, and appearance, but they can cause allergic reactions, hormone abnormalities, and cancer.

Food preservation is an ancient practise. It's done differently in different places.

Food Preservatives is Basically Done for Three Reasons:

- To preserve the natural characteristics of food
- To preserve the appearance of food
- To increase the shelf value of food for storage

Natural Food Preservatives

Sugar and salt are the earliest natural food preservatives that very efficiently drop the growth of bacteria in food. To preserve meat and fish, salt is still used as a natural food preservative.

Other natural preservatives in the category are alcohol, vinegar, etc. These are the traditional preservatives in food that are also used at home and while making pickles, jams, and juices, etc.

Chemical Food Preservatives

Chemical food preservatives have also been used for quite some time now. They seem to be the best and the most effective for longer shelf life.

According to the International Institution of Health, here are some of the chemical food preservatives that are widely used-

- Benzoates (such as sodium benzoate, benzoic acid)
- Nitrites (such as sodium nitrite)
- Sulphites (such as Sulphur dioxide)
- Sorbates (such as sodium sorbate, potassium sorbate

Antioxidants are chemical food preservatives that scavenge free radicals. Vitamin C, BHA, sodium nitrite, sulphur dioxide, and benzoic acid are food preservatives. Ethanol preserves food, wine, and brandy. Chemical food preservatives can be dangerous.

ISSN 2394 - 7780

Artificial Preservatives
Artificial preservatives are the chemical substances that stop the growth of bacteria, spoilage, and discoloration. These artificial preservatives can be added to the food or sprayed on the food.

Food Contamination
Food contamination occurs when microbes like bacteria or parasites or harmful substances spoil food. Biological food contaminants are most common. These pollutants can infiltrate food products at multiple points in the supply chain.

Global food contamination is a WHO acknowledged issue. “Food contamination that occurs in one place may affect the health of consumers living on the other side of the planet” is stated. Foodborne and waterborne diseases affect most people globally. Thus, tainted food poisons millions and kills more. This makes "food contamination" a major issue. Food contamination issues are many and developing.

The Major Being,
- Fresh produce contamination,
- Antibiotics in food products and
- Intentional contamination of foods

Fresh produce contamination is becoming a food safety issue. In 2002–2011, produce had the most outbreaks in the US, according to CSPI. This is a global trend, as shown by outbreaks of E. coli O157:H7 after eating contaminated packaged baby spinach in the EU (2006), E. coli in cucumbers in Germany and other EU countries (2011), Cryptosporidium infection from bagged salads in the UK (2012), L. monocytogenes from contaminated prepacked salad products (2016), and Salmonella from lettuce in pre-packaged salads in Australia.

Intentional contamination of foods and food products is also a growing global concern. Intentional food contamination refers to the deliberate addition of a harmful or poisonous substance to food products. It is a criminal act and known as food fraud. Foods that have been intentionally contaminated are unsafe to eat and can make consumers seriously ill. Therefore, it is also equally important to address the challenge of fraudulent food contamination.

Finally, ensuring the supply of safe food products is important to protect public health and the food industry. Scientific knowledge is needed to provide food products that are free of contamination or with a minimal risk of contamination.

Following four simple steps Clean, Separate, Cook, and Chill can help protect you and your family from food poisoning.

Clean: Wash your hands and surfaces often. Germs that cause food poisoning can survive in many places and spread around your kitchen.

Separate: Don’t cross-contaminate. Raw meat, chicken and other poultry, seafood, and eggs can spread germs to ready-to-eat food unless you keep them separate.

Cook: To the right temperature. Food is safely cooked when the internal temperature gets high enough to kill germs that can make you sick. The only way to tell if food is safely cooked is to use a food thermometer.

Chill: Refrigerate promptly.

Bacteria can multiply rapidly if left at room temperature or in the “Danger Zone” between 40°F and 140°F.

Food Adulteration
Food Adulteration can be defined as the practice of adulterating food or contamination of food materials by adding a few substances, which are collectively called adulterants.

Food adulterants are added for economic and technological reasons. These adulterants lower dietary nutrition and make it unfit for ingestion. All foods, including dairy, cereals, legumes, grains, meat, vegetables, fruits, oils, beverages, and more, may include these adulterants.

The process of contaminating food or adding to the food components is a common phenomenon in developing countries.

Listed below are the main reasons for adulterating food products:

- Practiced as a part of the business strategy.

ISSN 2394 - 7780

- An imitation of some other food substance.
- Lack of knowledge of proper food consumption.
- To increase the quantity of food production and sales.
- Increased food demand for a rapidly growing population.
- To make maximum profit from food items by fewer investments.

Methods of Food Adulteration
Here is a list of most common adulterants which have been added

1. Adding chemicals for faster ripening of fruits.
2. Mixing of decomposed fruits and vegetables with the good ones.
3. Adding certain natural and chemical dyes to attract consumers.
4. Mixing of clay, pebbles, stones, sand, and marble chips, to the grains, pulses, and other crops.
5. Cheaper and inferior substances are added with the good ones to increase the weight or nature of the product.

To enhance product quantity, adulteration is banned. This tainted food is hazardous and causes nutrition deficiency diseases, kidney disorders, and heart, kidney, and liver failure.

How can Adulteration be Prevented?
The National Health Service and Food Research Institute said various food products have been altered to enhance quantity and profit. All developed and backward nations practise these. World Health Day is commemorated worldwide on 7 April to raise awareness of food adulteration and encourage healthy eating.

Certain Safety Tips to Avoid Adulteration
1. Prevent consuming dark coloured, junk and other processed foods.
2. Clean and store all the grains, pulses, and other food products.
3. Wash fruits and vegetables thoroughly in running water before they are used.
4. Ascertain if the seal is valid or not, before buying food products like milk, oil, and other pouches.
5. Always make sure to check and buy products having an FSSAI-validated label, along with the license number, list of ingredients, manufactured date, and its expiration.

Finally, the way food is prepared and processed can also impact its quality.

Did you know that the right cooking method can maximize the nutritional quality of your meal? Overcooking, frying, and other high-heat methods can destroy nutrients and create harmful compounds.

Many foods are cooked to be eaten. Food processing involves many chemical and physical reactions. Healthy eating requires choosing the proper cooking method to maximise nutrition.

There is no perfect method of cooking that conserves all nutrients.

Cooking Tips to Preserve Nutrients
Recent studies have shown that there are several ways to enhance the availability of healthy nutrients through proper cooking techniques.

Pre-Preparation Phase
- Techniques like pasteurization and canning involve cooking, so canned fruits, vegetables and pasteurized milk need not be cooked again but can be reheated on the stovetop or in the microwave oven for a shorter time.
- Wash all fresh fruits and vegetables with cool tap water and avoid soaking when you wash to prevent leaching in water.
- Reduce the number of times you rinse pulses and grains, such as rice, before cooking, as nutrients may wash down the drain.

ISSN 2394 - 7780

Cooking Methods
Your cooking methods greatly influence nutrient retention in foods.

1. Steaming
Steaming is one of the best cooking methods for preserving nutrients, including water-soluble vitamins that are sensitive to heat and water.

2. Poaching and Stewing
Poaching is a quick method of cooking using very little liquid at a temperature below the boiling point. Stewing is a gentle method of cooking using small quantities of liquid to cover only half the food.

3. Pressure Cooking
Pressure cooking preserves the nutritional value of the foods.

4. Microwaving
Shorter cooking times and reduced exposure to heat are the keys to preserve the nutrients and flavours in microwaved foods.

5. Use of Fat as a Medium of Cooking
When fat is used as a medium of cooking, sauteing, stir-frying and shallow fat frying are the healthier ways to prepare foods, because cooking for a short time without water prevents loss of B and C vitamins.

Why Nutrients Are Lost While Cooking
Cooking changes the nutritional content of food. According to the TNAU Agritech Portal, cooking causes an inevitable loss of nutrients from food.

Let's Consider the Effect of Cooking on Some Nutrients:

1. **Vitamin C:** This vitamin is found in plenty of fruits and vegetables. University of Parma research reveals the effects of steaming, boiling and frying on vitamin C. When you steam your peas for 5 minutes, it results in a 32% loss of vitamin C whereas 48% is lost on boiling it and 87% on frying. A study states that the loss of vitamin C was lesser during pressure cooking when compared to boiling.
2. **Folate:** A B-vitamin, folate is the most essential nutrient for cell growth. It is on every pregnant woman's list of must-have vitamins. Let's look at the effect of cooking on this important vitamin. Spinach contains about 100 mcg of folate per half-cup when cooked. Boiling it results in a 58% loss of folate in just 10 minutes. Steaming it for even 5 minutes results in no loss of folate whereas frying results in a 50% loss.
3. **Potassium:** Isn't this the nutrient that's good for the heart? That makes it all the more important to cook it right. Potatoes are rich in potassium. If you boil them in a pot of water, about 50% of the nutrient is lost. More so, if you've cut the potato before boiling it. Also, most of the potassium is lost when the water in which they are cooked is discarded,
4. **Proteins:** Meat, eggs, beans, and legumes contain a good deal of proteins. The quality of protein may be reduced due to denaturation (destruction) of certain amino acids during cooking (e.g., hardening of meat).
5. **Vitamin A, D and E and K:** These are fat-soluble vitamins. When you cook them in a lot of oil, they leach (remove from food) the vitamins into the oil. Up to 60% of B-vitamins are lost when meat or fish is simmered for over 30 minutes. If you thought this was bad, just 5 minutes of boiling meat sees a loss of 45% of vitamin B-6. Carotene found in carrots is better retained in microwaving compared to pressure cooking.

Vitamin A, found in abundance in foods like spinach and carrots, dissolves easily in fats and oils. When you deep fry these foods in oil, the vitamin comes out from the vegetable and goes into the oil. The carotenoids found in this vitamin are well-preserved on boiling these vegetables.

Takeaway
Cooking for shorter time periods at lower temperatures with minimal liquid will help in retaining the nutritive value of foods.

CONCLUSION
In conclusion, food quality has a significant impact on our health. By choosing whole, nutrient-dense foods, avoiding additives and preservatives, and using healthy cooking methods, we can ensure that we are providing our bodies with the nutrients they need to function correctly, reducing the risk of chronic diseases, and promoting longevity.

ISSN 2394 - 7780

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International Journal of Advance and Innovative Research
Volume 10, Issue 4 (III): October - December, 2023
ISSN 2394 - 7780

THE IMPACT OF WEARABLE DEVICES: EXPLORING ADVANCEMENTS, APPLICATIONS, AND CHALLENGES

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ABSTRACT
Digital Support and Human Health, or for short known as Digital Health, deals with changing how doctors offer treatment, what patients do to get it, and how healthcare institutions work.

It is the use of digital technologies and platforms to enhance health care results, such as offering personalised patient care in person, increasing access to health care through mobile applications, or utilising neural networks to identify illnesses. All of these areas fall under the single title: digital health. This paper will mainly focus on how digitalisation has grown and how it helps the public in general, mainly speaking about the wearable devices attached to the body.

Background: Wearable devices are becoming increasingly popular in healthcare and biomedical monitoring systems, enabling continuous measurement of biomarkers for medical diagnostics, physiological health monitoring and evaluation.

Different chronic and acute diseases are becoming more prevalent as the global aged population develops. The medical profession is changing rapidly owing to the demand for point-of-care (POC) diagnosis and real-time monitoring of long-term health issues.

Nowadays these medical devices and digital assistants are becoming more prominent as they influence mental health. The use of digitalisation has led to companies creating their platforms, websites, and apps to reach more and more customers and consumers for a pharmaceutical company a customer and a consumer are two different people, the customer in short is the doctor who prescribes or guides the consumer ie patient.

Keywords: Digital health, Wearable Devices, demand for point-of-care diagnosis.

INTRODUCTION
"Digitalization has the potential to revolutionize healthcare, improving patient outcomes, enhancing access to care, and empowering individuals to take control of their health like never before." - Dr David Blumenthal, President of The Commonwealth Fund

DIGITALIZATION IN HEALTHCARE
Through technological innovation, the digital revolution has propelled corporate sectors to new heights. The healthcare sector has also embraced digital technology to assist the transition from mechanical and analogue electrical equipment to the digital technology accessible today. Searching for medical information resources, monitoring quality patient care, and increasing clinical assistance are all prominent uses of digital technology in the healthcare business. The article discusses the effect of technology on healthcare, as well as privacy and security problems associated with the use of technology in healthcare.

The significance and relevance of understanding the effectiveness of digitalisation on human health and wearable devices are paramount in today's technology-driven world.

Several factors make understanding the effects of digitalisation and wearable devices on health important. These include:

1. Health Monitoring and Management: Studying the effectiveness of digitalization and wearable devices can help healthcare professionals and individuals make informed decisions about monitoring and managing health.
2. Healthcare Accessibility: Digital health solutions and wearable devices can improve healthcare access in areas with limited services.
3. Personalized Medicine: Wearable devices can contribute to personalized medicine approaches.
4. Prevention and Well-being: Digital health solutions can promote preventive measures for better health and well-being.
5. Data-Driven Decision-Making: Digital health data can be used for data-driven decision-making in healthcare planning and resource allocation.

ISSN 2394 - 7780

6. Ethical and Privacy Considerations: Examining the ethical and privacy implications of digital health solutions is essential to protect individuals' privacy rights.

In conclusion, studying digitalization and wearable devices can transform the way we monitor and manage human health, improve healthcare accessibility, promote preventive measures, and personalized medicine, and facilitate data-driven decision-making.

LITERATURE REVIEW:
The literature review provides valuable insights into the effectiveness of digitalization on human health, specifically focusing on the impact of wearable devices. It explores the advancements in wearable technology, their applications in healthcare, and the challenges associated with their implementation.

Wearable devices have undergone significant advancements, including improvements in sensor technologies, data collection capabilities, miniaturization, and connectivity. These advancements have enabled a wide range of applications in healthcare, such as remote patient monitoring, fitness tracking, chronic disease management, elderly care, mental health monitoring, and emergency response systems.

Research suggests that wearable devices have the potential to improve patient engagement, detect health issues early, provide personalized interventions, enhance clinical decision-making, enable real-time data analysis, and promote long-term behaviour change. These findings highlight the positive impact of wearable devices on healthcare outcomes.

However, several challenges need to be addressed for the effective implementation of wearable devices. Data privacy and security concerns, accuracy and reliability of sensor data, user adherence and acceptance, regulatory and ethical considerations, integration with existing healthcare systems, and addressing health disparities are among the challenges identified.

Further research is needed to explore gaps in the literature and delve into areas such as user-centred design, standardization, interoperability, and addressing privacy and ethical concerns. These research areas are crucial for ensuring the successful integration and adoption of wearable devices in healthcare settings.

In conclusion, wearable devices have the potential to significantly impact healthcare outcomes. However, their successful implementation requires addressing challenges and promoting further research and development.

The research is based on secondary sources, with data collected from various websites and research papers listed in the bibliography. One of the websites visited during the survey was **Emergen Research**. Their research paper discusses **how smartphones can be used in connection with the conditions of use of a pacemaker**, and reports an increase in the market size of the product. Currently, these products are more prominent in the USA than in India, as India is a developing country.

The research highlights the importance of wearable technology in the healthcare industry, with a focus on online pharmacies and their preference for them in India. The literature review provides insights into the effectiveness of digitalization on human health, specifically focusing on the impact of wearable devices. It explores the advancements in wearable technology, their applications in healthcare, and the challenges associated with their implementation.

While some papers which are taken are from **Emergen Research** it is a market research and strategy British Columbia company while others are from **Physics World** which is an international monthly magazine which covers all areas of physics and the various papers mentioned in these magazines are on various **low-cost wearable devices that quantify breathing activities while a person is sleeping** are some of the examples.

RESEARCH DESIGN:
The study will employ a mixed-methods research design, combining quantitative and qualitative approaches, to provide a comprehensive understanding of the topic.

SAMPLING:

a) Quantitative:
A representative sample of individuals from different demographic backgrounds will be selected using random sampling techniques. The sample size will be determined based on statistical power calculations to ensure sufficient data for analysis.

ISSN 2394 - 7780

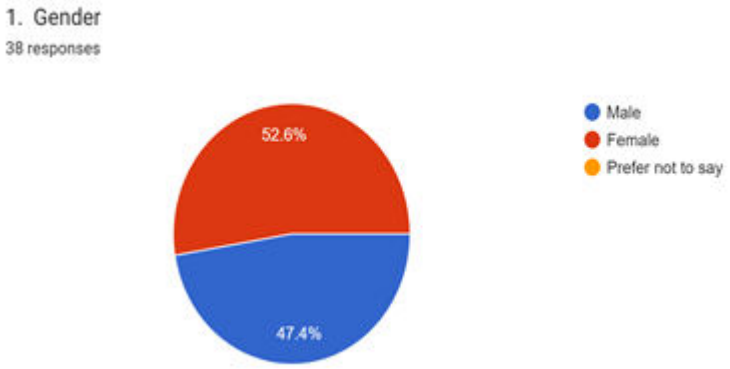
b) Qualitative:
A purposive sampling technique will be used to select a diverse range of participants who have experienced the effects of digitalization on their health. Participants will be chosen based on criteria such as age, gender, occupation, and level of digital engagement.

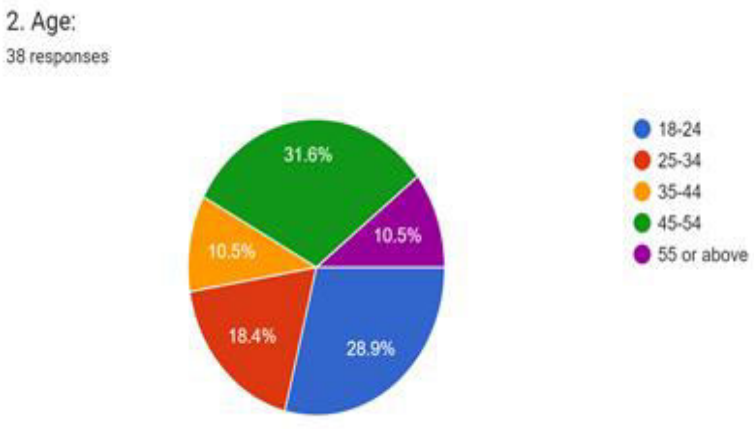
DATA COLLECTION:
Quantitative Method: Structured questionnaire was taken with more close-ended questions on the above topic and was circulated amongst people of various age groups from 18 years to the age of 55 years and above. The questionnaire was administered through an online survey which was preferred and helpful for the collection of the data.

Below mentioned are some descriptions related to the questions asked during the collection of the data and their analysis.

ANALYSIS
The first few questions were to make the population, firstly aware of themselves and whether they were aware of what wearable devices are.

Considering that the 38 responses were recorded as 100% there were about 52.6% females and remaining males and what age groups they belong to.





From questions no. 3, 4, 5 and 6 we can see that:

Have they ever used a wearable device (e.g., smartwatch, fitness tracker, augmented reality glasses, etc.)? About 65.8% said they had and the remaining didn't use it till now. The next question was about what type they use? maximum answers were smartwatches which were almost 60.5%(23 responses).

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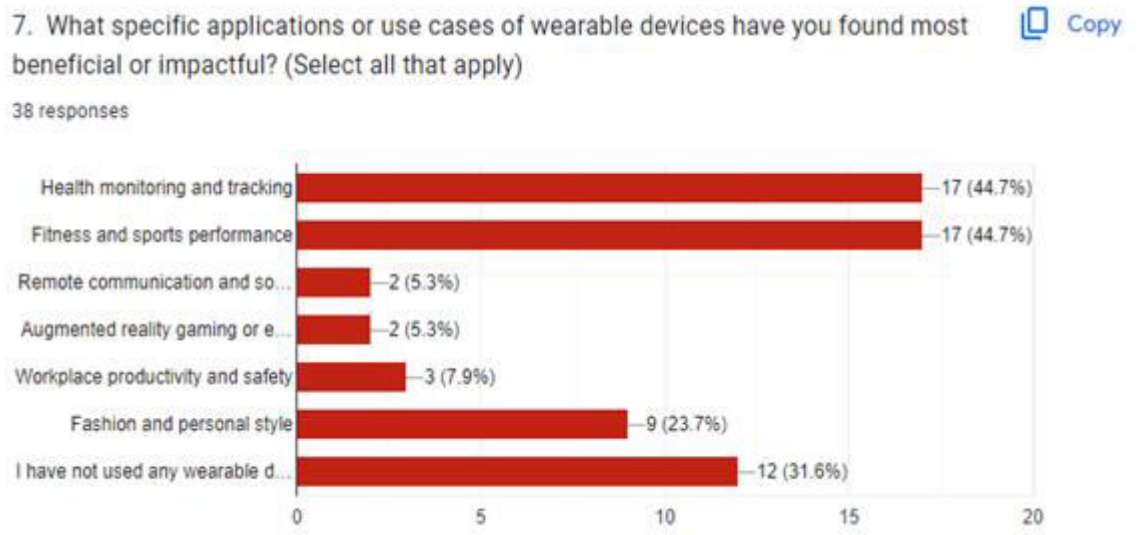

The questions that were asked were on what frequency was the use of the device and what were the primary reasons for the usage of the devices which were mainly for health monitoring and fitness and the purpose of fashion and personalising their style.

We can also perceive from the results that people know that wearable devices happen to have a positive impact to somewhat positive impact on people of about 13.2% to about 42.1% respectively and no percentage of negative impact on the people.

Secondary Data:
The secondary data considered in this paper are the research papers of various universities which are still on trial levels but in some ways are trying to impact people's lives.

The research papers which are considered are based on various conditions faced by people and need to be guided/monitored. The conditions which are taken into consideration were:

- Cardiovascular diseases
- Respiratory diseases
- Epilepsy
- Sleeping Disorders

The Various Applications Are:

1. **Healthcare and Fitness:** Wearable devices are widely used in monitoring health and fitness-related metrics. They can track activities, heart rate, and sleep patterns, and provide real-time feedback to individuals, promoting healthier lifestyles and facilitating personalized healthcare.
2. **Sports and Athletics:** Wearables have found applications in sports performance monitoring, helping athletes track metrics like speed, distance, heart rate, and technique. Coaches and trainers can use this data to optimize training programs and enhance performance.
3. **Smartwatches and Smart Clothing:** Wearable devices in the form of smartwatches and smart clothing offer features beyond health tracking, including notifications, communication, navigation, and mobile app integration.

Challenges which have been currently taken into consideration:

1. **Privacy and Data Security:** Wearable devices collect sensitive personal data, raising concerns about privacy and data security. Ensuring secure data storage, and transmission, and protecting user privacy are ongoing challenges for wearable technology developers.
2. **Data Accuracy and Reliability:** Despite advancements in sensor technology, ensuring the accuracy and reliability of data collected by wearable devices remains a challenge. Factors such as sensor calibration, device placement, and data interpretation need to be addressed for optimal accuracy.

ISSN 2394 - 7780

3. **User Adoption and Engagement:** While wearables have gained popularity, user adoption and long-term engagement can still be a challenge. Ensuring that wearables provide meaningful and actionable insights, addressing user needs, and designing intuitive interfaces are key factors in improving adoption rates.

RESULTS AND DISCUSSION: The survey results indicate that the number of people using wearable devices is increasing across various age groups. The most commonly used wearable devices are smartwatches and fitness trackers, but people also use them for other purposes. Overall, people are aware of the potential uses of these devices and use them daily.
However, it seems that people only use these devices for specific purposes such as health monitoring, fitness, and sports performance. When asked about using medical devices for healthcare purposes, such as treating medical conditions like cardiac and epilepsy conditions, respondents showed a neutral attitude.

CONCLUSION
Based on the results and discussion provided, the following conclusions can be drawn:

1. **Increasing Adoption:** The survey indicates a growing trend in the adoption of wearable devices across various age groups. This suggests that wearable technology is becoming more mainstream and accessible to a wider population.
2. **Popular Device Types:** Smartwatches and fitness trackers are the most commonly used wearable devices. This indicates that individuals are primarily interested in devices that offer features related to health monitoring and fitness tracking.
3. **Limited Usage Scope:** While wearable devices are famous for health monitoring and fitness purposes, the survey suggests that their usage may be limited to these specific areas. The respondents showed a neutral attitude towards the use of wearable devices for medical conditions, indicating a narrower application scope beyond general health and fitness.
4. **Awareness and Acceptance:** The overall awareness of the potential uses of wearable devices is high, and individuals are incorporating them into their daily lives. This indicates a level of acceptance and understanding of the benefits offered by wearable technology.
5. **Opportunity for Medical Device Expansion:** The neutral attitude towards the use of medical devices for healthcare purposes highlights a potential area for growth and development. There may be opportunities to further educate and promote the benefits of wearable devices in medical contexts, such as managing chronic conditions or providing real-time health data to healthcare professionals.
6. **Consideration of Diverse Use Cases:** To maximize the impact of wearable devices, it is essential to explore and develop use cases beyond health and fitness. This can involve integrating wearable technology into various domains, such as improving workplace safety, enhancing personal productivity, or facilitating communication and connectivity.

These conclusions suggest that while wearable devices have gained popularity and are commonly used for health and fitness purposes, there may be opportunities to expand their applications in healthcare and other areas. Further research and awareness campaigns can help promote the benefits and address any concerns related to the use of wearable devices in diverse contexts.

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International Journal of Advance and Innovative Research
Volume 10, Issue 4 (III): October - December, 2023
ISSN 2394 - 7780

AN EMPIRICAL INVESTIGATION INTO MOTIVATIONS FOR UNDERGRADUATE STUDENTS' EMPLOYMENT DECISIONS AND THE EFFECT THEY HAVE ON ACADEMIC ACHIEVEMENT

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ABSTRACT
There are several reasons why undergraduate students begin working and handle both their education and employment at the same time. The family income of the pupils has been taken into account in this study as one of the elements for the objective of the study. An investigation will look at how students' early employment choices and their financial situations interact. It can be the primary motivator for making students work. For practically everyone, managing two tasks at once is challenging. It may have a detrimental impact on a number of important aspects of their lives. Among all the effects, this study considered the effects of working decisions on students' academic achievement. For this study, data collecting has been completed from 206 undergraduate working and non-working B.com students belonging to the Mumbai region. According to the finding, family income has no relationship with students' work performance. The working decisions of undergraduate students have an effect on their academic performance, but the difference is minor.

Keywords: Working Students, Family Income, Academic Performance.

INTRODUCTION
At the college level, the culture of balancing work and school is highly prevalent. Students, particularly those nearing graduation, work to become financially independent and lessen the financial burden of their tuition on their parents. This may be their own choice, or perhaps their financial situation has compelled them to do so. On the other hand, there are some student populations whose primary goal is to gain real-world work experience even Many students also feel secure to ensure a job before graduation so that they can continue working at the same place. Numerous studies have already been conducted on relevant subjects, including how students who work handle their stress, how working affects their academic achievement, the difficulties working students encounter, etc. to comprehend the condition of students who balance work and school at the same time. Students today have access to many different career options. They can work full-time, part-time, or perform internships. Even when employed fulltime, individuals have the option of working entirely in a separate profession or one linked to their subject of study. It goes without saying that students with some experience typically land employment sooner than those who lack experience. Even though many students prepare for government exams or want to enrol in postgraduate programs like MBA from reputable colleges that require difficult entrance exams like CAT, MH-CET, XAT, NMAT, and IIFT, students still prefer to combine their studies with professional courses like CA, CMA, CS, ACCA, and CFA, among others. They choose not to work on their studies.

REVIEW OF LITERATURE
Zhang and Yang (2020) The research paper is on employed students and their academic performance. It showed the pros and cons of working while studying and if there is any threshold of work hours. The paper focused on student worker characteristics on the basis of gender, ethnicity/race, and socio-economic status. It also studied job features such as job position, job location, and the major relevance of jobs to students. In effect on academic performance, it displayed positive effects such as students gaining on-the-job experience and being able to financially support their education on the other side negative effects are students get less time for their study due to their job, they are unable to attend lectures and they get tired because of it not able to concentrate which are negatively affecting their educational achievement and students whose working hours are less are able to perform better than high working hours students. The research studied 25 previous studied and found job while learning has a more negative effect on the study and only one study showed more positive effect than negative.

Săvescu, Stoe, and Rotaru (2017) The case study focused on the stress experienced by working college students. Students used various methods to deal with it. A comparison study was conducted between working and nonworking students on a variety of parameters such as academic performance, stress level, and situation experienced by students in the previous month. Working students with their families and friends can manage their stress and improve their academic performance by discovering their interests and goals. Faculty and professors must consider stress as a factor that influences student performance and behavior. There is a need to develop a student support program in order to reduce stress among students.

ISSN 2394 - 7780

Darolia (2014) While investigating the effects of working on academic performance, the study divided students into two groups: full-time working students and part-time students. The study discovered that there was no significant evidence to show that students' academic performance was influenced by their working decisions, whether part-time or full-time unless they made time for their studies. If part-time students increase their working hours, their results may not alter significantly. When full-time students increase their employment hours, they may finish fewer credits per semester.

Geel and Backes-Gellner (2012) Earning and learning at the same time might be advantageous for students. The study focused on how different types of employment affect the short and longterm labour markets during tertiary education. It has divided working students into two groups: those who work in fields linked to their studies and those who do not. According to the findings, students who work in fields linked to their studies had reduced unemployment risks, shorter job search duration, higher income effects, and greater job responsibility. Students who work in unrelated fields do not receive favourable results, but they are nonetheless in a better position than nonworking students because they are less likely to be laid off.

Tessema, Ready, and Astani (2014) Part-time jobs for college students had an effect on their satisfaction and academic performance, according to a study that divided students into five groups: those who worked for 0 hours (unemployed), 1-10 hours, 11-15 hours, 16-20 hours, 21-30 hours, and 31 hours or more. The T-test was used to analyse data in the inquiry. An intriguing conclusion of the study is that it has a beneficial effect if students work between 1 to 10 hours per week, but if students work more than 11 hours per week, their satisfaction and GPA decrease, but the difference is modest. Working while in college will help students reduce their financial load and boost their employability after graduation, but it may have a modest detrimental influence on their satisfaction and GPA if they continue to increase working hours.

However, students might work for longer if a balance between work and study is required.

RESEARCH GAP

1. There isn't conclusive evidence that children who don't work fare better academically than those who do.
2. Financial backgrounds of students who are not employed are better than those of students who are employed are not adequately reported in prior studies.

OBJECTIVES OF THE STUDY

1. To study the impact of a student’s employment on his academic performance.
2. To assess the relationship between family income and the working decisions of students.

DATA ANALYSIS AND INTERPRETATION

Fig. 5.1 Working status of students

Source: Primary Data

206 B.com students were selected as the sample size for the study. FYB.com, SYB.com, and TYB.com are all covered under 206 pupils.

Working Students	Non-Working Students	Total Number Of Students
59	147	206
29%	71%	100%

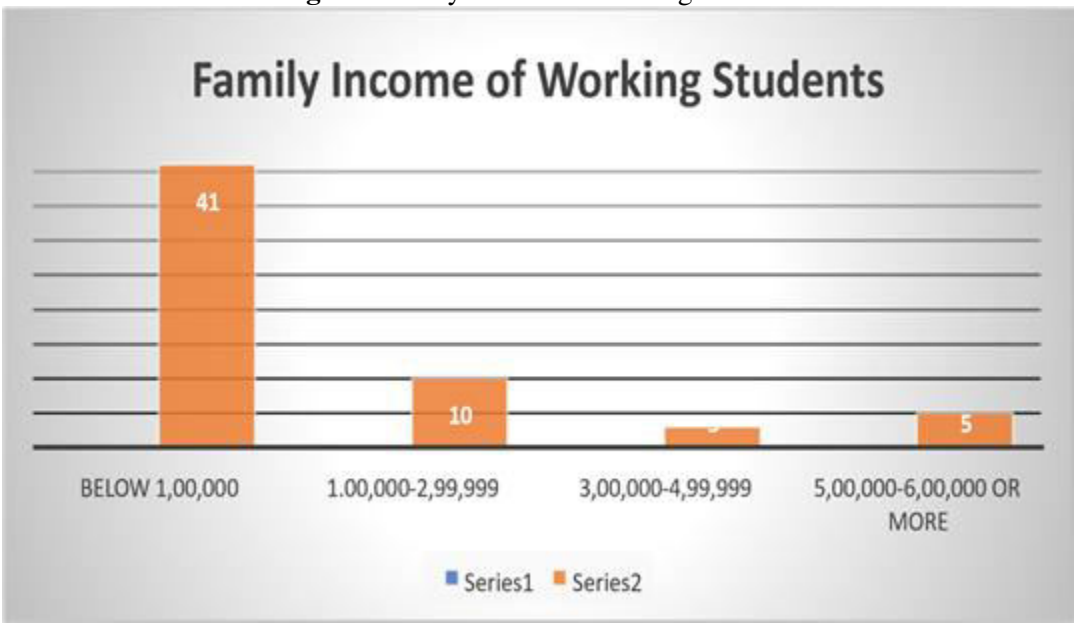
ISSN 2394 - 7780

Two key factors are considered for an investigation -

1. Student family income to determine their financial situation.
2. Students' grades from the previous semester to assess their academic performance.

1. What is your family income?

Fig. 5.2 Family income of working students

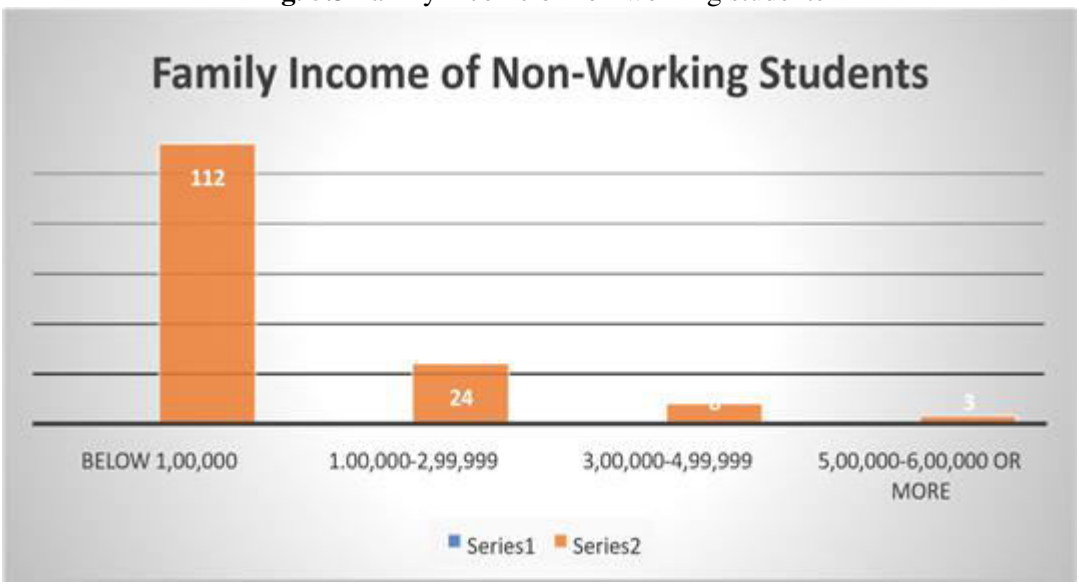


Source: Primary Data

59 students, or 29% of the 206 students in the sample, were employed. According to the aforementioned chart, 41(69.49%) students had a family income of less than Rs. 1,000,000,

10(16.94%) students had a family income of between Rs. 1,000,000 and 2,99,999, and 3(5.09%) students had a family income of between Rs. 3,00,000 and 4,99,999. 5(8.48%) pupils were from families with an annual income of 5,00,000–6,00,000 rupees or higher.

Fig. 5.3 Family income of non-working students



Source: Primary Data

According to the sample size, 147 out of 206 students, or 71%, were employed. According to the aforementioned data, 112(76.20%) students had a family income below 1,00,000 rupees, whereas 24(16.32%) students had a family income between 1,00,000 and 2,99,999 rupees, 8 (5.44%) students had a family income between 3,00,000 and 4,99,999 rupees. 3(2.04%) students' families made between 5,00,000 and 6,00,000 rupees or higher per year.

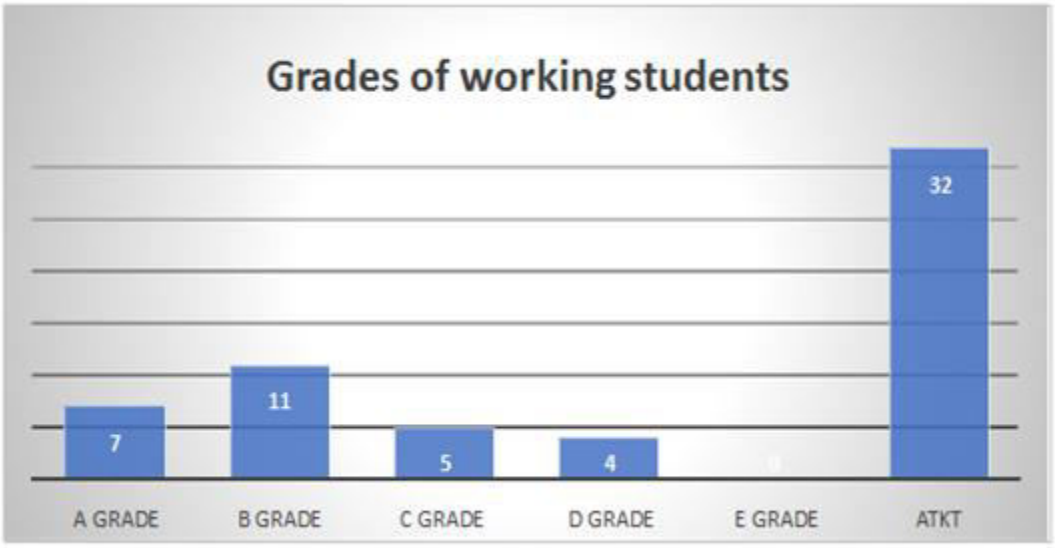
ISSN 2394 - 7780

INTERPRETATION-

FAMILY INCOME (206)	WORKING (59)	STUDENTS	NON-WORKING STUDENTS (147)
Below 1,00,000	69.49%		76.20%
1,00,000-2,99,999	16.94%		16.32%
3,00,000-4,99,999	5.09%		5.44%
5,00,000-6,00,000	8.48%		2.04%
TOTAL	100%		100%

2. Which Grade you have got in last Semester?

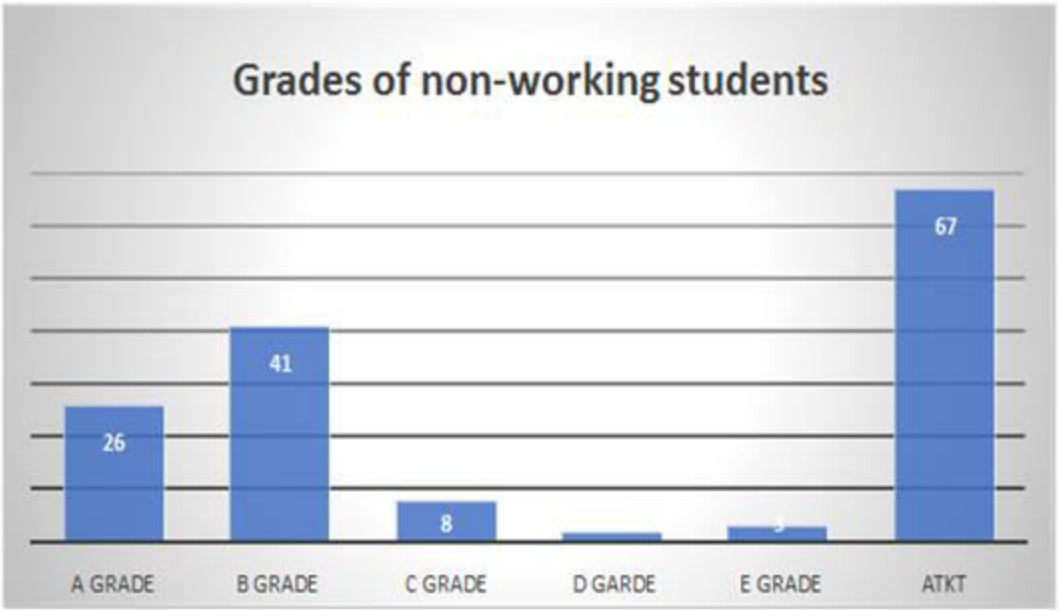
Fig. 5.4 Grades of working students



Source: Primary Data

Their grades from the previous semester are shown in the graph above. Out of 59 pupils, 7(11.86%) received an A, 11(18.64%) received a B, 5(8.48%) received a C, 4(6.79%) received a D, no one received an E, and 32((54.23%) received an ATKT.

Fig. 5.5 Grades of non-working students



Source: Primary Data

Their grades from the previous semester are shown in the graph above. Out of 147 pupils, 26(17.69%) received an A, 41(27.89%) received a B, 8((5.44%) received a C, 2(1.36%) received a D, 3(2.04%) received an E, and 67(45.58%) received an ATKT.

ISSN 2394 - 7780

INTERPRETATION-

GRADES	WORKING (59)	STUDENTS	NON-WORKING STUDENTS (147)
A	11.86%		17.69%
B	18.64%		27.89%
C	8.48%		5.44%
D	6.79%		1.36%
E	0%		2.04%
ATKT	54.23%		45.58%
TOTAL	100%		100%

LIMITATION

1. The research only included B.com students, not other sections such as BBI, BAF, BMS, BFM, etc.
2. The data is collected from students belonging to the Mumbai region.
3. There are a variety of factors that push students to work at the undergraduate level; this study just considers one of them.
4. Working and studying at the same time have many detrimental implications on students' lives; however, this study just looked at academic performance.

CONCLUSION

The percentage of working students is lower than the percentage of non-working students, which indicates that few students desire to work during their undergraduate studies, according to the analysis and interpretation of the aforementioned data. Working and not working each have perks and downsides of their own. The choice of whether or not a student works is unrelated to their family's income because many students have very low family incomes yet choose not to work. Under the greatest income, there are more working students than nonworking students. Therefore, not all of the students came from financially disadvantaged families; some of their labour is to obtain experience for opportunities in the future or earn money to pay off their own expenses when they are younger. Even though more students who do not work are in financial need, they still prefer to enrol in full-time courses. On the other side when it comes to measuring the impact of student's employment affects their academic performance, Students who do not work perform better academically than those who do but the difference in their grades is small. It is due to time constraints, exhaustion at the office, stress, lack of motivation, and other factors, working students find it challenging to balance their education and jobs at the same time. Students who are not employed have more time for studying, attending classes, and finishing their assignments. As a result, students who want to do the job while working can go for it at the cost of some marks they can get practical job training which will help them to master numerous valuable employment-related skills as well as reduce the chances of unemployment.

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MANUSCRIPT SUBMISSION

GUIDELINES FOR CONTRIBUTORS

1. Manuscripts should be submitted preferably through email and the research article / paper should preferably not exceed 8 – 10 pages in all.
2. Book review must contain the name of the author and the book reviewed, the place of publication and publisher, date of publication, number of pages and price.
3. Manuscripts should be typed in 12 font-size, Times New Roman, single spaced with 1" margin on a standard A4 size paper. Manuscripts should be organized in the following order: title, name(s) of author(s) and his/her (their) complete affiliation(s) including zip code(s), Abstract (not exceeding 350 words), Introduction, Main body of paper, Conclusion and References.
4. The title of the paper should be in capital letters, bold, size 16" and centered at the top of the first page. The author(s) and affiliations(s) should be centered, bold, size 14" and single-spaced, beginning from the second line below the title.

First Author Name1, Second Author Name2, Third Author Name3

1Author Designation, Department, Organization, City, email id

2Author Designation, Department, Organization, City, email id

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5. The abstract should summarize the context, content and conclusions of the paper in less than 350 words in 12 points italic Times New Roman. The abstract should have about five key words in alphabetical order separated by comma of 12 points italic Times New Roman.
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Fox, S. (1984). Empowerment as a catalyst for change: an example for the food industry. *Supply Chain Management*, *2*(3), 29–33.

Bateson, C. D.,(2006), 'Doing Business after the Fall: The Virtue of Moral Hypocrisy', Journal of Business Ethics, 66: 321 – 335

- **Multiple author journal article:**

Khan, M. R., Islam, A. F. M. M., & Das, D. (1886). A Factor Analytic Study on the Validity of a Union Commitment Scale. *Journal of Applied Psychology*, *12*(1), 129-136.

Liu, W.B, Wongcha A, & Peng, K.C. (2012), "Adopting Super-Efficiency And Tobit Model On Analyzing the Efficiency of Teacher's Colleges In Thailand", International Journal on New Trends In Education and Their Implications, Vol.3.3, 108 – 114.

- **Text Book:**

Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2007). *Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies* (3rd ed.). New York: McGraw-Hill.

S. Neelamegham," Marketing in India, Cases and Reading, Vikas Publishing House Pvt. Ltd, III Edition, 2000.

- **Edited book having one editor:**

Raine, A. (Ed.). (2006). *Crime and schizophrenia: Causes and cures.* New York: Nova Science.

- **Edited book having more than one editor:**

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- **Chapter in edited book having one editor:**

Bessley, M., & Wilson, P. (1984). Public policy and small firms in Britain. In Levicki, C. (Ed.), *Small Business Theory and Policy* (pp. 111–126). London: Croom Helm.

- **Chapter in edited book having more than one editor:**

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- **Electronic sources should include the URL of the website at which they may be found, as shown:**

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- **Unpublished dissertation/ paper:**

Uddin, K. (2000). A Study of Corporate Governance in a Developing Country: A Case of Bangladesh (Unpublished Dissertation). Lingnan University, Hong Kong.

- **Article in newspaper:**

Yunus, M. (2005, March 23). Micro Credit and Poverty Alleviation in Bangladesh. *The Bangladesh Observer*, p. 9.

- **Article in magazine:**

Holloway, M. (2005, August 6). When extinct isn't. *Scientific American, 293*, 22-23.

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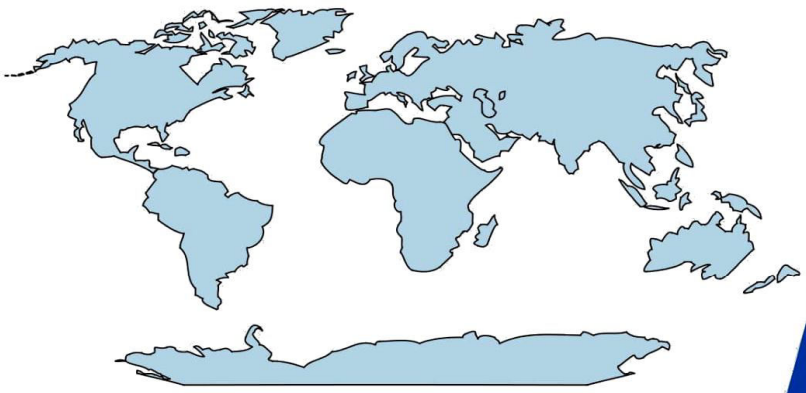

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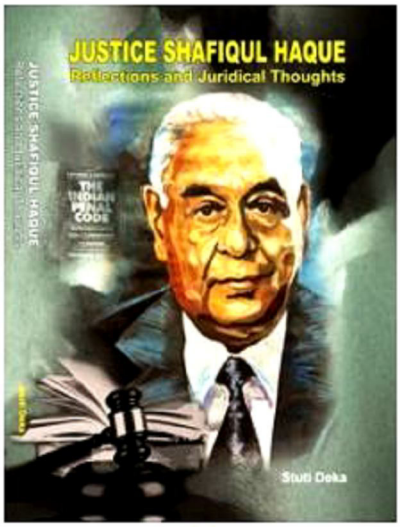

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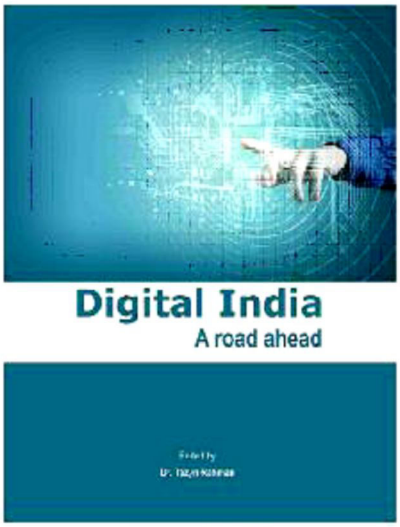

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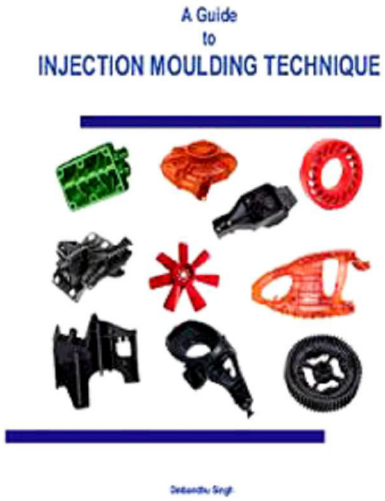

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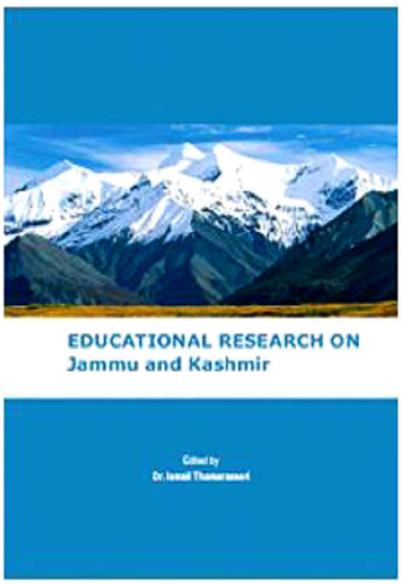

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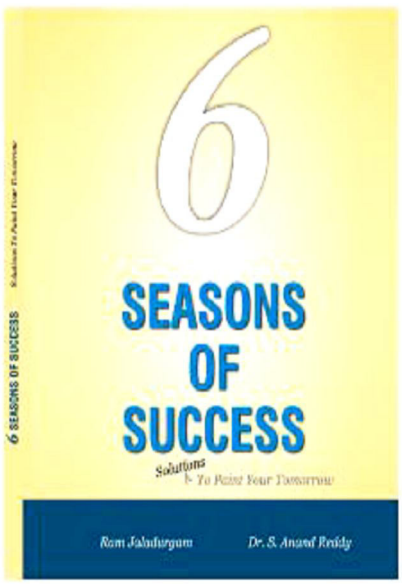

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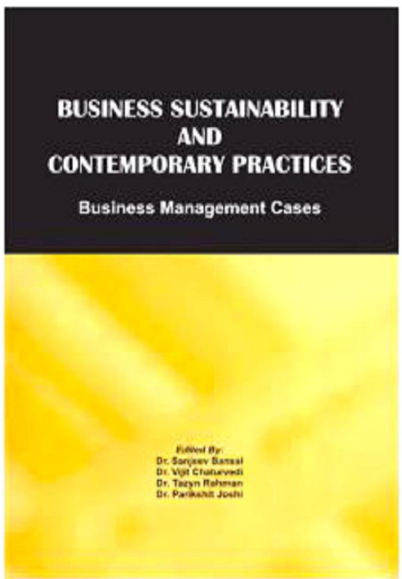

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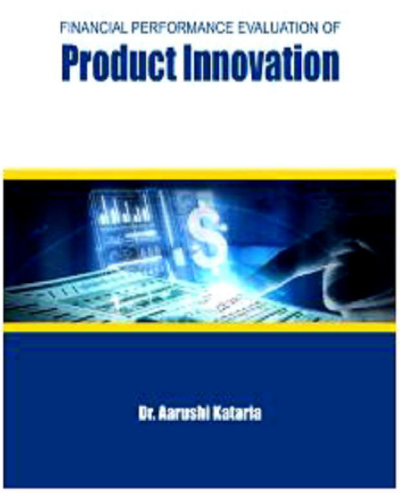

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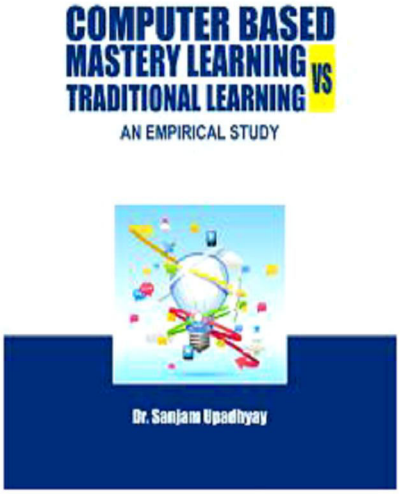

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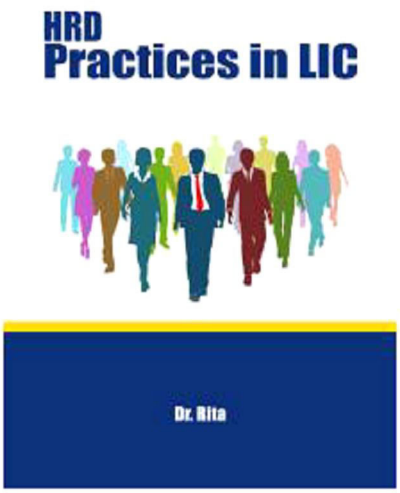

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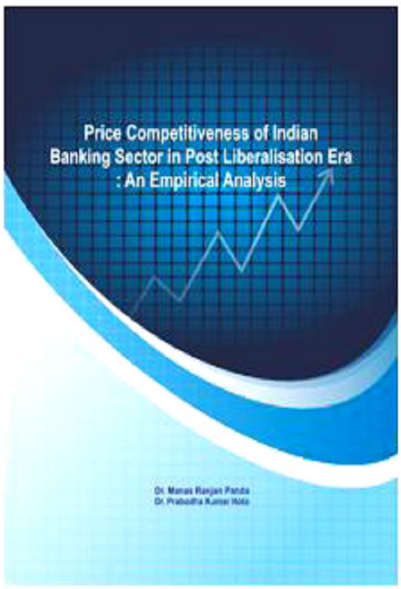

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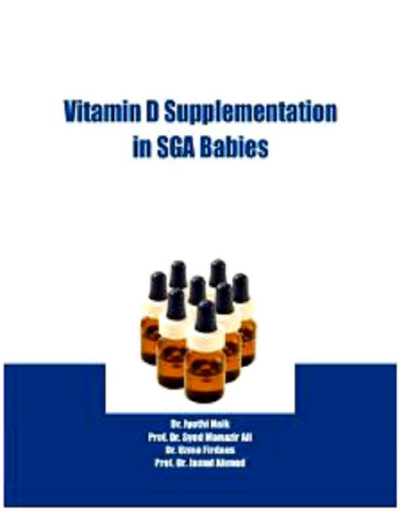

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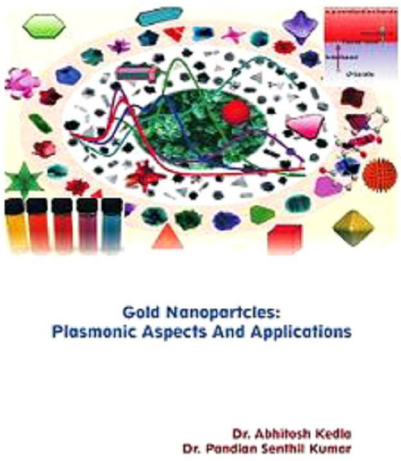

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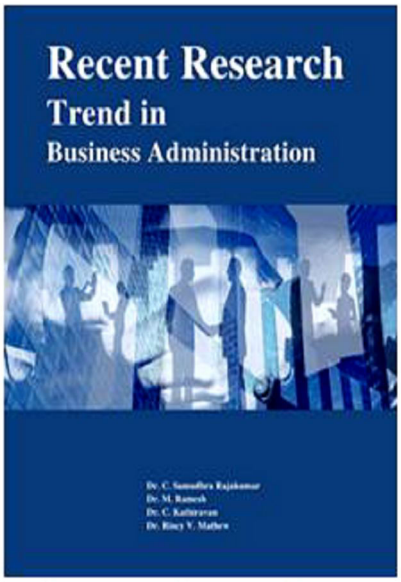

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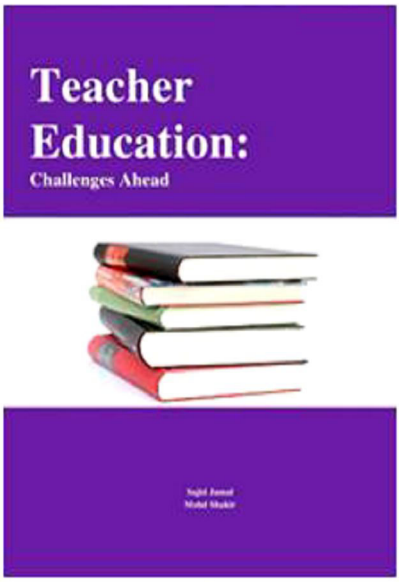

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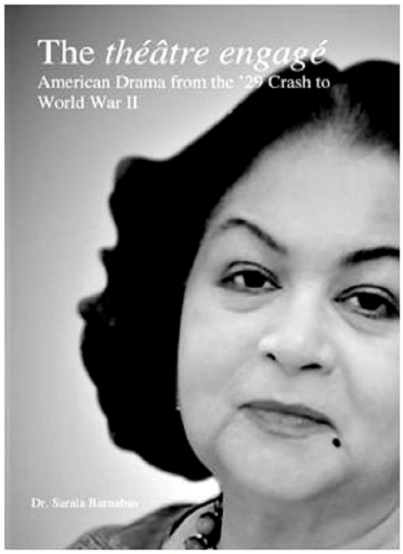

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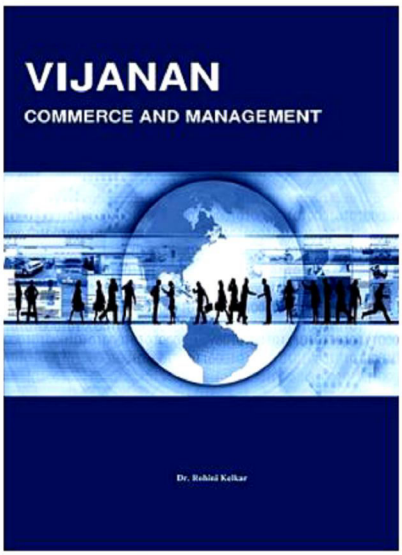

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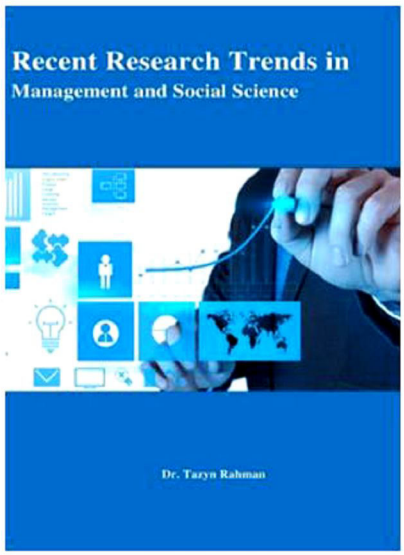

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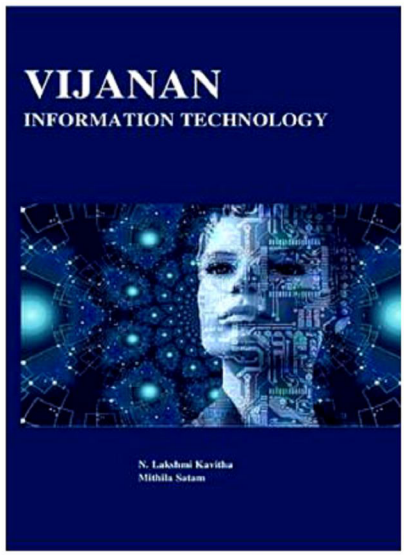

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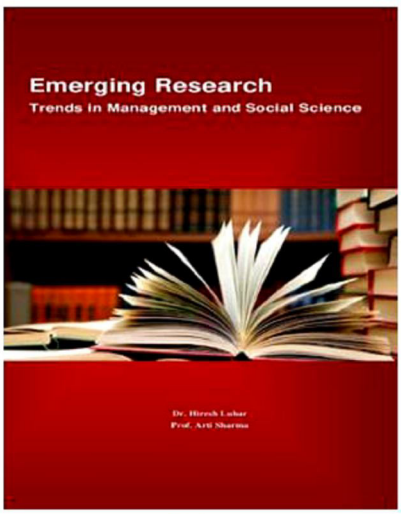

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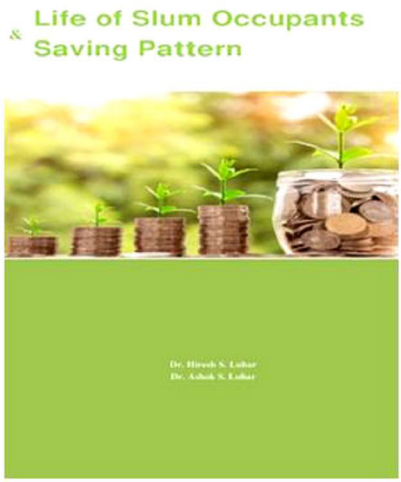

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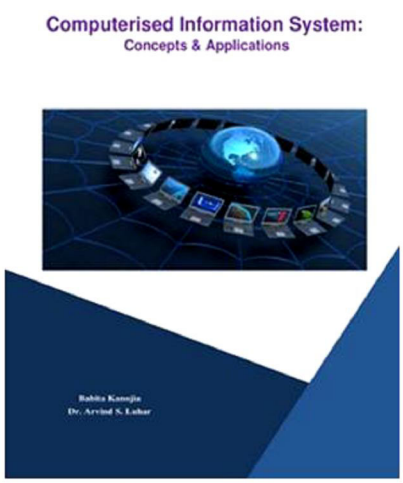

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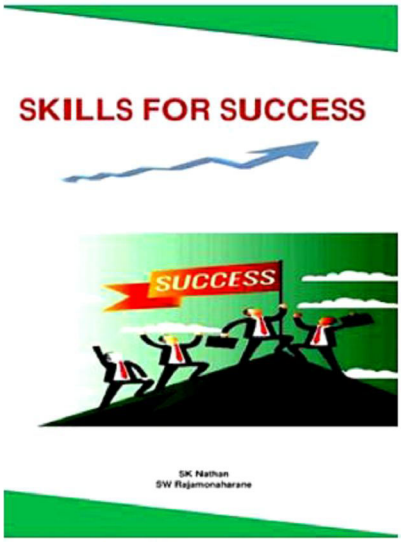

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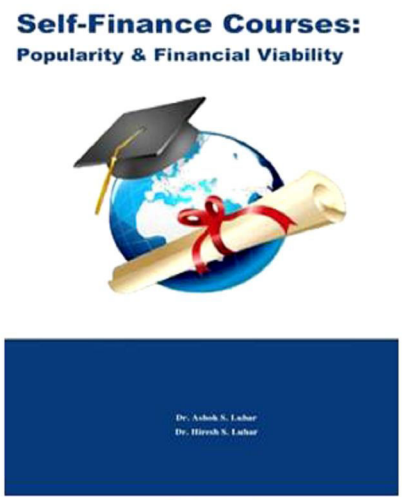

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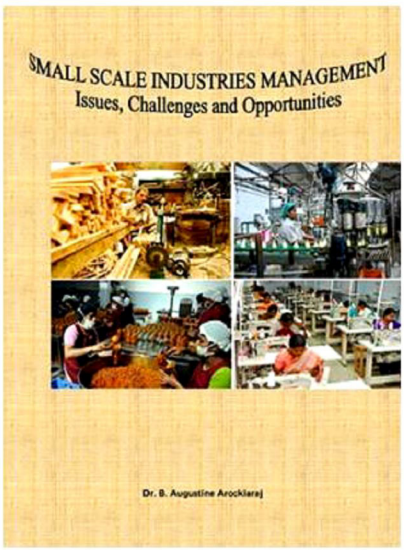

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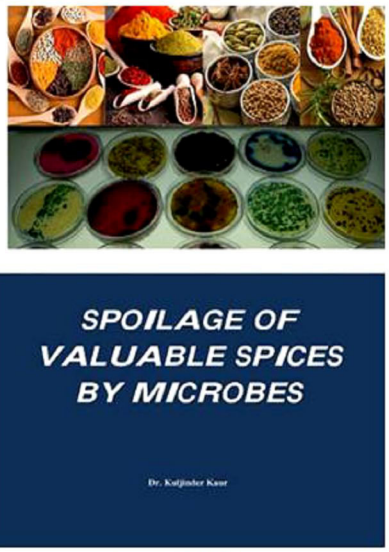

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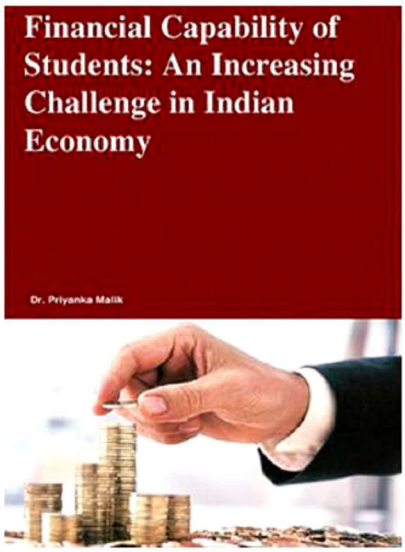

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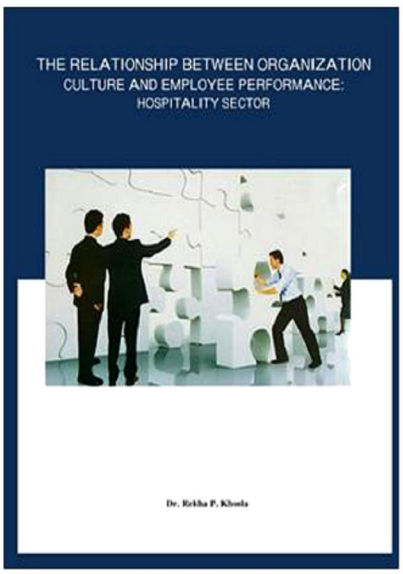

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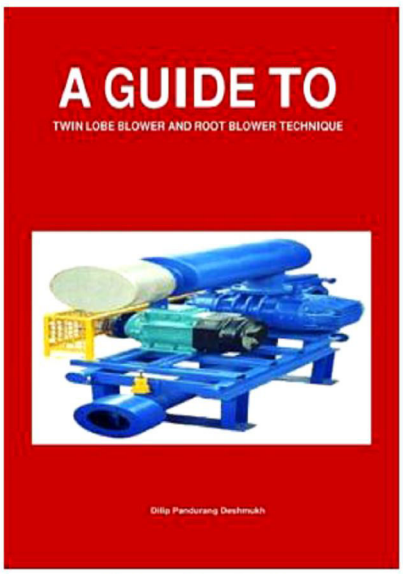

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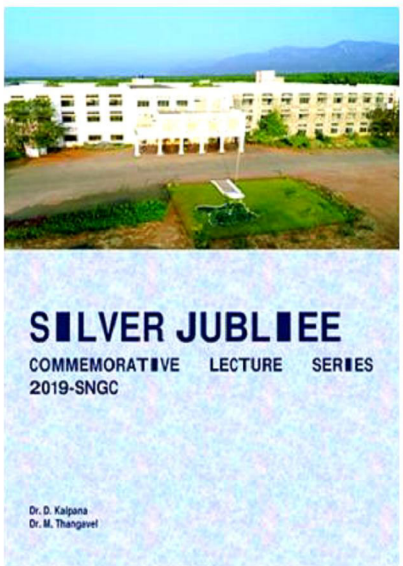

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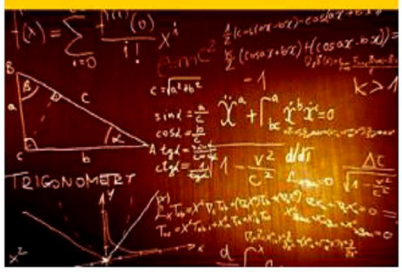

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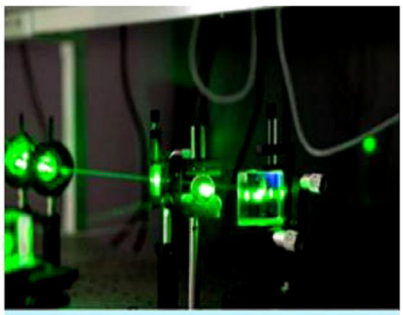

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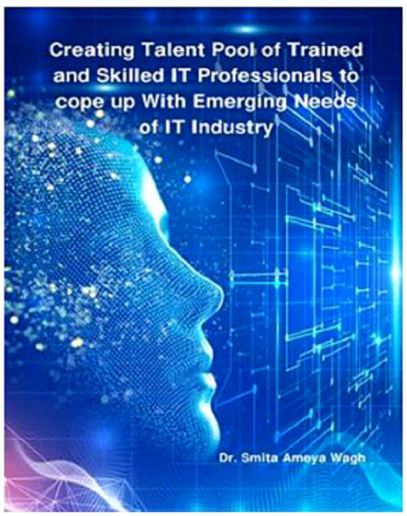

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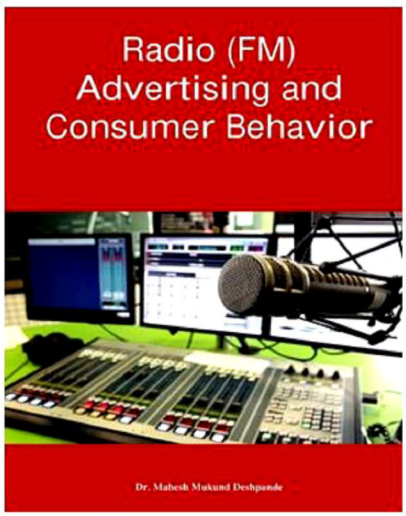

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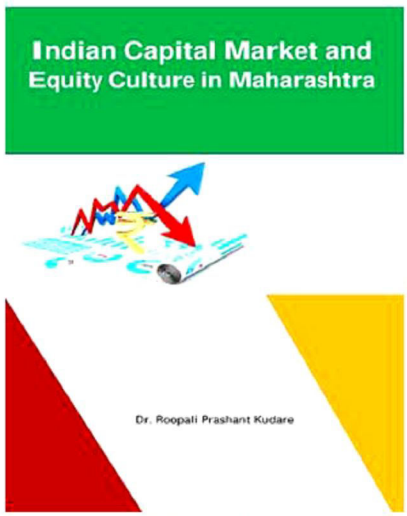

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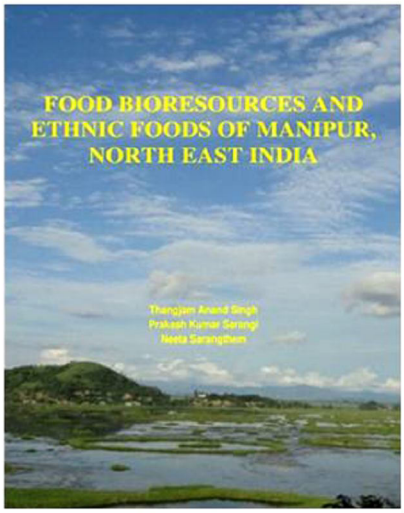

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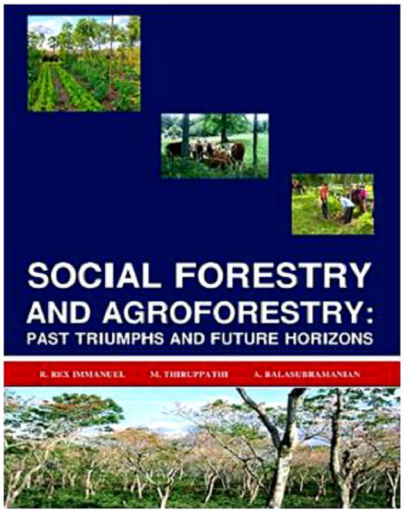

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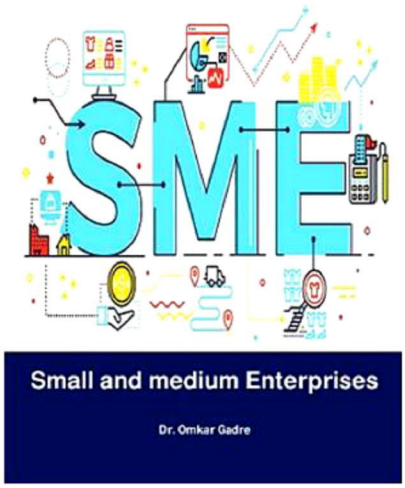

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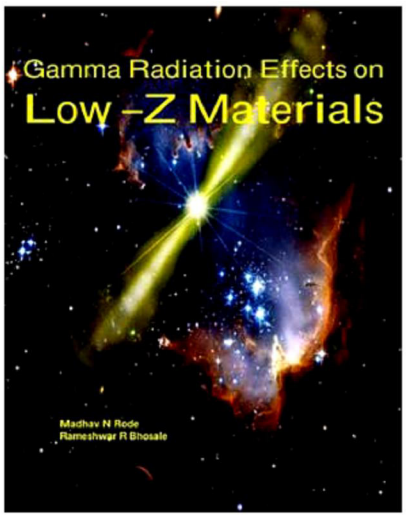

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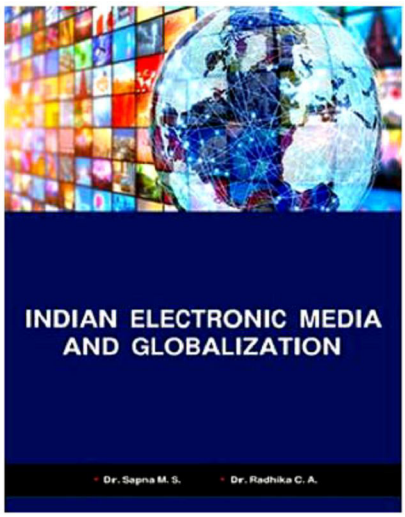

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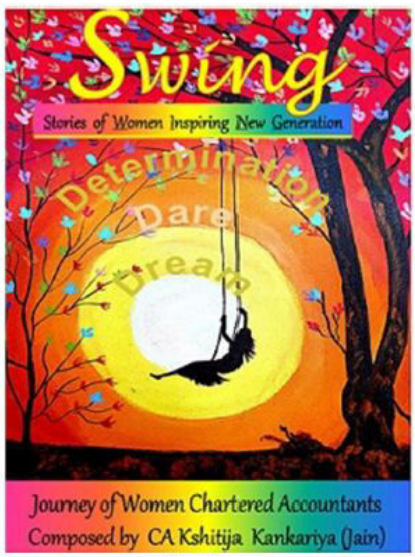

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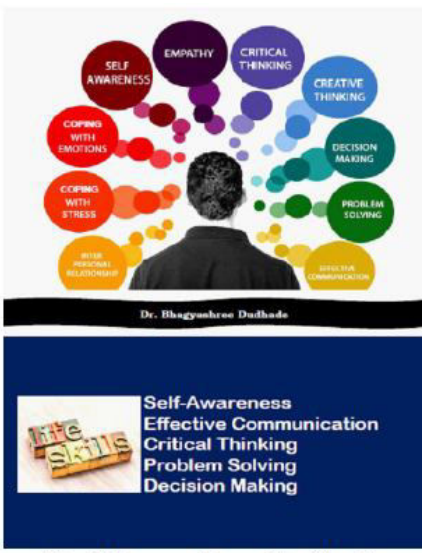

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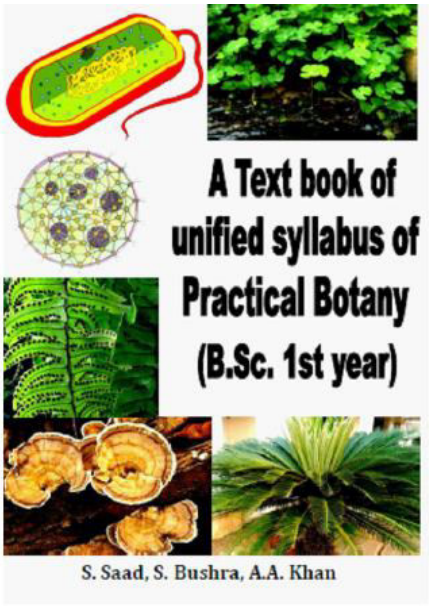

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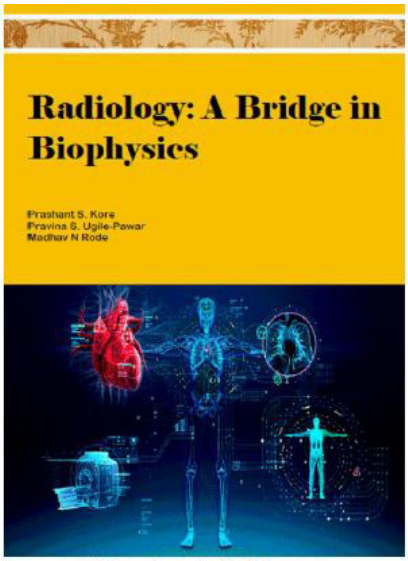

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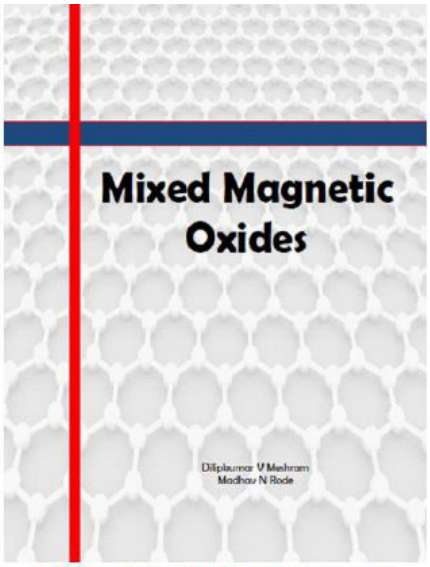

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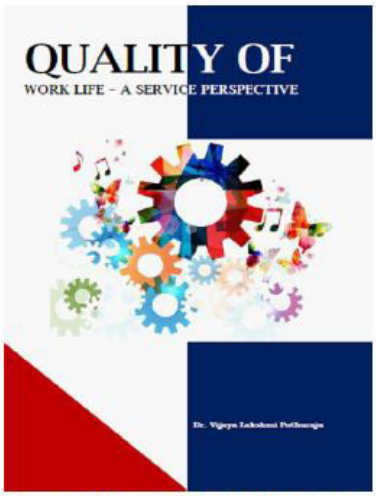

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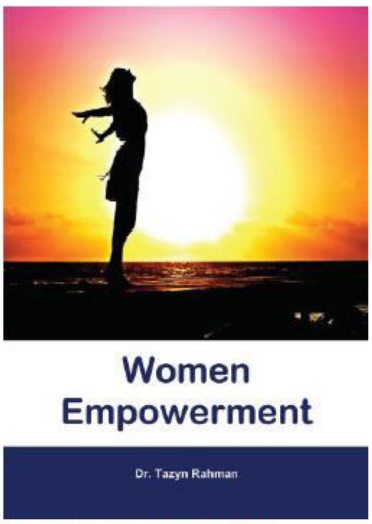

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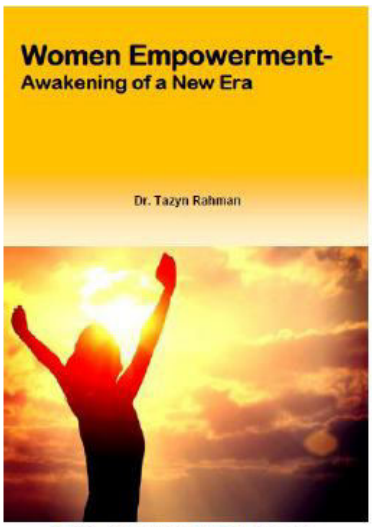

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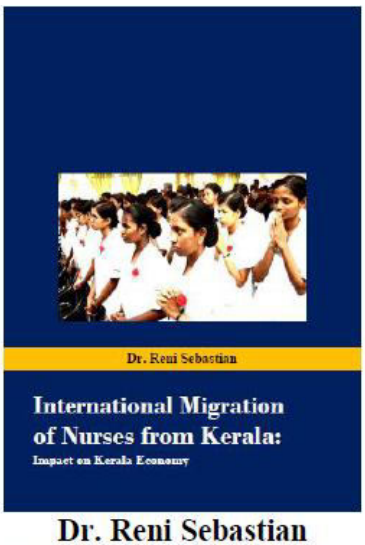

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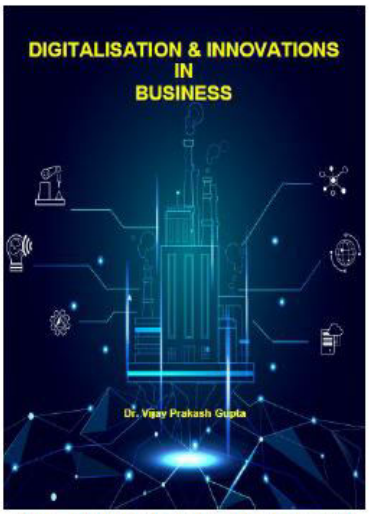

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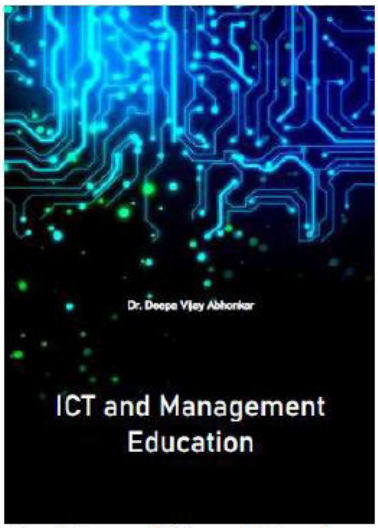

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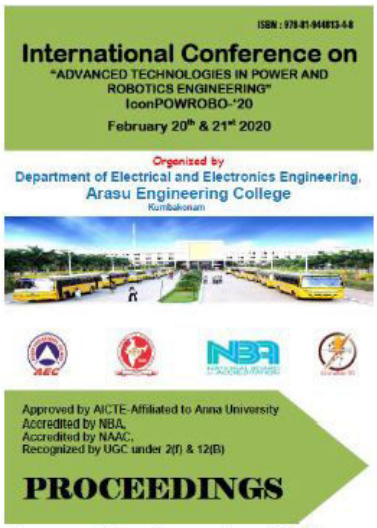

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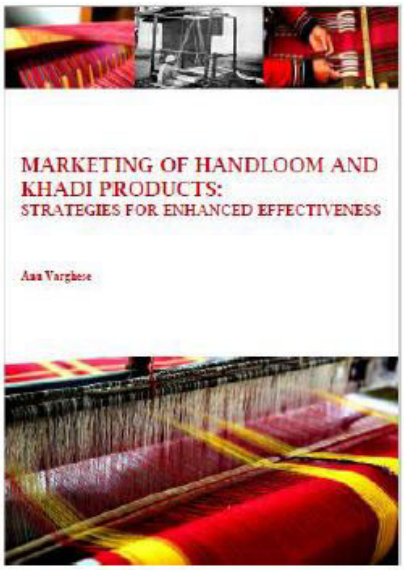

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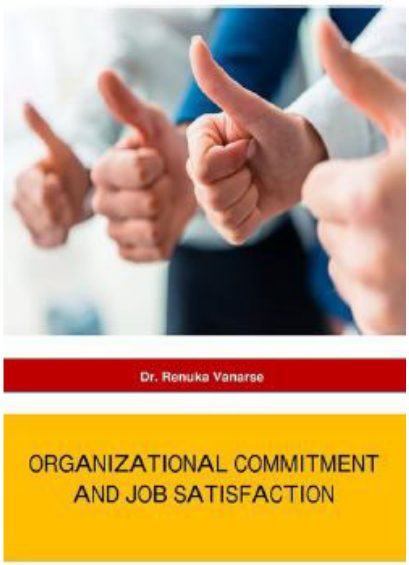

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