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Competitiveness of Hospitality and Tourism Management Students in Local and International Competition

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Abstract

The main purpose of the study is to evaluate the skills develop by participating in the local and international competition and to measure the institutional learning outcome developed among the students. The study made use of a quantitative descriptive method where in the respondents were all the students of College of International Tourism and Hospitality Management who participated the local and international competition for the past five years (2013-2017). A total of 105 students responded and agreed to take part in the study. The result of the study revealed that College of International Tourism and Hospitality Management remains most awarded college as they participate to numerous local and international competition and achieved various awards. There are conceptual skills developed such as capacity for generating new ideas or being creative, capacity to adopt to new situations and be problem solvers. Also, human skills are developed such as appreciation of diversity and multiculturalism concern for quality and capacity to learn as to the institutional learning outcome, through participation local and international competition, being credible and competent learners were enhanced. The researcher

than the skills competition being participated especially in other field such as in Research, Business Plan Presentation and other hospitality and tourism related competition. Also, the faculty expert may inculcate in their lecture and classroom activities those practices in the competition so that all students will be equipped to be competitive professionals. **Keywords:** Competent Professionals, Conceptual Skills, Human Skills

INTRODUCTION

Competitiveness is highlighting the strengths, weaknesses, opportunities and threats within a competitive environment. The concept of competitiveness described above applies to all firms and what makes a firm competitive or not will very much depend on the market segment the firm has chosen to compete in. Thus several researches has been conducted regarding competitiveness (Altunina, 2011; Buharov, 2011; Chernilevsky, 2002; Kim & Lee, 2012; Ivanenko et al., 2015). For ease of exposure and conceptualization, Falciola, et al., (2020) organize these components under three main pillars: Compete, Connect and Change. The first pillar focuses on being competitive, the second pillar highlighted the importance on the connectedness and last pillar refers to the capacity to adjust to or embrace change. The principle of competition often plays an explicit role because of the need to connect knowledge and data, thus realizing the importance of the technological revolution to the competitiveness of organizations.

Moreover, Bas Collins et al., (2021) point out the importance of considering the multicultural and diversity among the higher education institutions in terms of the institutional nature, curriculum offered, and industrial training experiences, as well as extracurricular activities and competitions. In this study, It would evaluate the human and conceptual skills. Human skills refers to the understanding and the capability on one person to work other whereas conceptual skill refers to the capability to

work with concepts and ideas. This are the two main skills to be evaluated as the students compete in the local and international competition.

The nature of higher education in hospitality and tourism is changing drastically. Internationalization and new technology, along with demographic shifts including certain growing communities and rising minorities, are the main factors behind all these changes happening. All these developments are also witnessed by all of this, searching for skilled workers who are flexible and guide others through these changes (Kim and Jeong, 2018). Furthermore, Lugosi and Jameson, (2017) suggest that many of the key challenges are not unique to the hospitality and tourism management area, but they also focusing more on the specific concern under this sector. More importantly, the it is essential to determine how students and higher education institutions need to respond to particular challenges as to evaluate the competitiveness of the student in this fast growing industry.

Lyceum of the Philippines University, an institution of higher learning that is committed to the advancement of philosophy and values of its founder, Jose P. Laurel: "Veritas et Fortitudo" (truth and fortitude) and "Pro Deo et Patria" (for God and Country). Lyceum of the Philippines University is dedicated to the holistic development of the students especially in its pursuit of truth and acts with fortitude as well as in serving God and country. It is committed to provide quality education and develop the student to be future leaders, lifelong learners and globally competitive professionals who possess the 4C's - competence, commitment, credibility and collaboration(lpubatangas.edu.ph). Competitiveness is one of the area that is being developed by the university to its student and thus constantly aim to be the best. Students were given an opportunity to compete in the area of hospitality and tourism skills competition. Lyceum of the Philippines University through the College of International Tourism and Hospitality Management is active in participating local and international competition with the assistance of the faculty experts and coaches.

Given this fact, studies in higher education, specifically on hospitality and tourism is dealing on the employability and ability of the graduates to adapt to the industry. This study addressed the this gap on hospitality and tourism education, focusing on the competitiveness of the student. The ability of the students to be employed and its competence to face this in demand sector requires a rigorous process as early as student years of the future hoteliers and tourism practitioners. Participating to local and international competitions will surely equip the student to face the real world in this sector. The main purpose of the study is to evaluate the skills develop by participating in the local and international competition and to measure the institutional learning outcome developed among the student. This study would be in the benefit of the College of International Hospitality and Tourism Management for curriculum enhancement as the college aims to be a center of excellence providing quality education and producing globally competitive professionals. Through this study, it will determine the competitiveness of the student and thus base on the result of the study, the researcher will proposed recommendation for enhancement program of the college.

OBJECTIVES OF THE STUDY

This study aims to assess the competitiveness in terms of knowledge and skills of hospitality and tourism management student in local and international competition. More specifically, this study aims to determine the skills developed by participating in local and international competition in terms of human and conceptual skills. Also, to determine institutional learning outcome that were developed thru participating the local and international competitions; to present the international and national awards received for the past 5 years (2013-2017); Finally, proposed development plan based on the result of the study.

LITERATURE REVIEW

Competitiveness of Hospitality and Tourism Management Students

Experts have tested out and tested the competitiveness modeling approach and the competitiveness assessment developed on

the foundations of it; students are aware of competitiveness assessment metrics and have experience of self-assessing their competitiveness; the dual education level model of a higher education institution that transforms students (Iriste, 2018). Thus, Iriste, and Katane, (2017) believe that the logically based method of self-assessment of competitiveness acknowledged by students and experts greatly widened the vision of the students as a pedagogical instrument affecting the opinions among members of the profession of prospective hoteliers on the competitiveness concept.

LPU has identified the institutional learning outcomes which represent the qualities that all LPU students should possess when they graduate. These outcomes are anchored on the 4C's: competence, commitment, credibility and collaboration. According to Nhung (2020), it is essential to have both quality management and transparency purposes, thus there is a need for HEIs to strengthen internal quality assurance through enhancing and developing among its student the competence of a professional individual, commitment to provide quality service and be credible as well as be collaborative in any way. This may be develop through participating into local and international competitions.

Moreover, Renfors et al., (2020) concluded that there are five skills categories: creation of goods and interactions, Human and conceptual skills, multi-sectoral and collaboration, business operations management, cultural awareness and internationalization. It can be inferred that mainly operational level skills and expertise were established by the stakeholders.

Human skills. Human skills are defined as "the abilities that enable a leader to collaborate effectively with subordinates, colleagues, and superiors in order to achieve the organization's objectives" (Northouse, 2018). Human skills are those that demonstrate the ability to communicate effectively, perform, or connect with others. These abilities allow you to maximize human potential in the workplace and inspire others to achieve better results. In the study of Pelau et al., (2021) concluded that the higher levels of productivity and fascination, as well as a positive

social effect, decrease the impression of consumers of reducing human skills in relation to artificial intelligence. In addition, the social circle mediates the relationship between artificial intelligence-generated productivity and fascination and the sense of retaining human skills. Thus the perception in relation to human skills, indicates as intermediary to the influence for the student success and professionalism. In addition, Human skills are the latest criteria for the improved development workflow that are described in the present report. In addition, current education 4.0 methods are analyzed, and eventually, a teaching concept tailored to the paradigm needs of Revolution Industry 4.0 is proposed (Mourtzis, 2018). With this, there is a need to capitalize to the student's development on this human skill to be competitive enough to face the chosen field.

Conceptual Skills. Conceptual skill can be defined as "the ability to see the company as a whole structure, as well as the relationships between its parts." Conceptual leaders are at ease discussing the concepts that form an organization and the complexities involved" (Northouse, 2018). The abilities that are present in terms of knowledge and capacity for critical thinking and formulating ideas are referred to as conceptual skills. It has the ability to see the big picture, evaluate and diagnose problems, and come up with innovative solutions. This allows them to effectively anticipate obstacles that their department or the company as a whole can face. In the study of Wilson, et al., (2017) it was revealed that for technological skills, higher abilities were reported as compared to the conceptual skills were significantly lower. These findings can help to target this demographic effectively with interventions in education programs. Moreover, there is a need to improve on the interpersonal and conceptual skills of students and the developmental paths of these skills over a lifetime. It offers proof of the malleability and importance of these skills across a wide variety of cultural contexts (Chernyshenko, et al., 2018). Expert competitiveness can clearly be characterized by the principle of products competitiveness, since on the labor market, experts are "sellers" of technical expertise and skills, and they compete. An integrative measure of his expertise and skills in relation to the requirements of the industry as well as the broader requirements of society's social and economic growth. Communication skills, tolerance, and conceptual skill are all examples of social skills and competencies. (Ivanenko et al., 2015).

In the recent study of Bratianu and Vatamanescu, (2017) it was revealed that most undergraduate students prefer the traditional approach – less involvement and responsibility in doing more difficult intellectual work – whereas most master's students are open to a new outlook on learning to learn, namely, improving conceptual skills. Whereas Riso et al., (2019) confirm that students from more educated families and those who participated in sports clubs had greater conceptual and verbal capacity. Better cardiorespiratory health, less sedentary activity, and less screen time can improve student's cognitive abilities as well as their conceptual skills.

METHODS

Research Design

The study used descriptive quantitative method to assess the human and conceptual skills that measure the competitiveness of hospitality management student in local and international competition. Apuke, (2017) believes that quantitative research is described as the process of quantifying and evaluating variables in order to obtain results. It entails the use of statistical methods to analyze numerical data in order to answer questions such as who, how many, when, where, and how. It also refers to the process of obtaining numerical data in order to demonstrate a problem or phenomenon.

Participants

The respondents were all the students of College of International Tourism and Hospitality Management who participated the local and international competition for the past five years (2013-2017). A total of 105 students responded and agreed to take part in the study. These students were those who join either local and international competition both reaping an award or just participating.

Instrument

The questionnaire is based on Northouse, (2017) Three Skill Approach whereas, Human skill is being able to work with people, technical skill is knowledge in a given activity or subject, and conceptual skill is the ability to work with new ideas. However, on this study, just concentrate on the two skills which are human and conceptual skills since the technical skill is more on the knowledge and in every competition it may vary. This study uses the human and conceptual skills as it only applies for the Hospitality and tourism skills competition. This was reviewed and validated by research and faculty expert under the of College of International Tourism and Hospitality Management and the Center of Research, Innovation and Data Management.

The first part of the instrument is to determine the skills developed by participating in local and international competition in terms of human and conceptual skills using the Likert scale of: 3.50 - 4.00 - Strong; 2.50 - 3.49 - Considerable; 1.50 - 2.49 - Weak; and 1.00 - 1.49 - None. Meanwhile, the second part of the instrument is to determine institutional learning outcome that were developed thru participating the local and international competitions using the Likert scale of: 3.50 - 4.00 - Strongly Agree; 2.50 - 3.49 -Agree; 1.50 - 2.49 - Disagree; and 1.00 - 1.49 - Strongly Disagree

Data Gathering Procedure

The data of this research were taken through an online survey form, tracking all the students who participated in the local and international competition. The respondents were given an ample time to answer the questionnaire through an online survey and the researcher retrieved the questionnaire immediately after completion. Data were tallied, interpreted, analyzed.

Data Analysis

The gathered data was encoded, computed, and analyzed by means of Statistical Package for Social Sciences (SPSS). Weighted mean and Rank were used to determine the skills developed by participating in local and international competition in terms of human and conceptual skills. Also Weighted mean and Rank were used to determine institutional learning outcome that were developed thru participating the local and international competitions.

Ethical Considerations

For research purposes only, the data and information was kept confidential. Before administering the research instrument, the researchers gathered the complete consent from the respondents. All forms of communication were carried out with total integrity and accountability. In addition, participants are free to choose whether to participate, without suffering any pressure or manipulation on themselves.

RESULTS AND DISCUSSION

Table 1 Competitiveness of Hospitality Management Students in Local and International Competition in terms of Human Skills

Indicators	WM	VI	Ranking
1. Information management skills	3.16	Considerable	10
2. Critical and self-critical abilities	3.23	Considerable	7
3. Capacity to adapt to new situations	3.30	Considerable	2
4. Capacity for generating new ideas (creativity)	3.34	Considerable	1
5. Problem solving	3.28	Considerable	3
6. Basic general knowledge in the field of study	3.26	Considerable	4.5
7. Teamwork	3.19	Considerable	8
8. Interpersonal skills	3.25	Considerable	6
9. Ability to lead a group or a team	3.26	Considerable	4.5
10. Ability to work in an interdisciplin- ary team	3.18	Considerable	9
Composite Mean	3.25	Considerable	

Legend: 3.50 – 4.00 – Strong; 2.50 – 3.49 – Considerable; 1.50 – 2.49 – Weak; 1.00 – 1.49 – None

Table 1 presents the Competitiveness of Hospitality Management Students in Local and International Competition in terms of Human Skills which is considerable with a composite mean of

3.25.

Top indicators in human skills are capacity for generating new ideas or being creative(3.34) followed by capacity to adopt to new situations (3.30) and able solve problems (3.28). All of these indicators under human skills are verbally interpreted as considerable.

By joining local and international competition, students affirm that creativity, adapting to new situation and being problem solvers were considerable develop. Competitions allows the student to think outside the box by developing creative inputs and coming up with guality outputs. Through the guidance of the coaches and faculty expert the students were able to be competitive enough in bringing out the best in them. Human skills referring to the ability of an individual to adjust to new different norms based on various facets, particularly cognitive, motivational and behavioral characteristics. This is supported by the study of Liu et al., (2017) whose findings show that competition enable the student to be creative and adapt to the environment and definitely will improve student innovation while also encouraging critical thinking about sustainability. It should be promoted as a useful tool in sustainability education in the future. In addition, Carmeli, et al., (2015) find out that importance of positive involvement in encouraging the processing of relational knowledge and supporting innovative and creative activities at both individual and group effort.

Meanwhile, at the least indicators for human skills are ability to portray teamwork(3.19) followed by ability to work in an interdisciplinary team and the least is having the information management skills (3.16). Even though these indicators rank the least still these indicators under human skills are verbally interpreted as considerable.

There are competition which requires group effort and some were just tasked to work individually. Nonetheless, may it be individual or in group, it shall always require team effort and ability to work in an interdisciplinary team and the least is having the information management skills. An effective team needs both Competitiveness of Hospitality and Tourism Management... 11

emotional intelligence and expertise, including technical, cultural, interactive and social skills, depending about how often people are working together, teamwork becomes greater or smaller than everything else (McCallin and Bamford, (2007). This may rank the least due to some circumstance, the student may just relay on themselves and with the limitation of time and preparation. In the study of Yoosomboon, and Wannapiroon, (2015), a model was develop to help improve the skills in information management. It was revealed that experts positively recommend interdisciplinary learning activity to be incorporated in the program and is appropriate for students to be develop through competition and other school activity.

Table 2 Competitiveness of Hospitality Management Studentsin Local and International Competition in terms of ConceptualSkills Indicators

	WM	VI	Ranking
1. Ability to communicate with non-experts	3.20	Considerable	5.5
2. Appreciation of diversity and multiculturalism	3.47	Considerable	1
3. Ability to work in an international context	3.19	Considerable	8
4. Understanding of cultures and customs of other countries	3.14	Considerable	10
5. Ability to work autonomously	3.19	Considerable	8
6. Project design and management	3.20	Considerable	5.5
7. Initiative and entrepreneurial spirit	3.28	Considerable	4
8. Ethical commitment	3.19	Considerable	8
9. Concern for quality	3.39	Considerable	2
10. Capacity to learn	3.33	Considerable	3
Composite Mean	3.26	Considerable	

Legend: 3.50 - 4.00 - Strong; 2.50 - 3.49 - Considerable; 1.50 - 2.49 -Weak; 1.00 - 1.49 - None Table 2 presents the Competitiveness of Hospitality Management Students in Local and International Competition in terms of Conceptual Skills which is considerable having the composite mean of 3.26.

Top indicators of conceptual skills are Appreciation of diversity and multiculturalism (3.47) followed by concern for quality (3.39) and capacity to learn (3.33). All of these indicators under conceptual skills are verbally interpreted as considerable.

In the study of Renfors et al., (2020) reveals that one of the skills that is mainly essential for the hospitality and tourism is that sense of cultural awareness and internationalization. Also, eagerness to learn and produce quality products and services is an integral component for the hospitality and tourism practitioners. Appreciation of diversity and multiculturalism may ranked the highest, since in the college, students has always been remined and guided by their teachers to always check on the quality and learn something new. Since, they may not be master and experts of everything, at least try to learn something would enable them be globally competitive professional.

Meanwhile, at the least indicators for conceptual skills are ability to ethical commitment, ability to work autonomously and ability to work in an international context(3.19) and the least is understanding of cultures and customs of other countries (3.14). Even though these indicators rank the least still these indicators under conceptual skills are verbally interpreted as considerable.

It is in the essence of human growth for new ethical and moral issues to emerge on a regular basis (Ohman, 2016) Thus, according to Hutchings, (2018) education plays and important role in developing among the student their ethical commitment. 'To build a world that is much more just, peaceful, and sustainable, all individuals and communities must be prepared and motivated by intelligence, skills, and values, as well as be instilled with a heightened awareness to drive such change.' This is where education plays an important part.

One of the concern and challenge that the student may encounter in the competition is able to work autonomously and ability to work in an international context. As in the sudy of Campbell et al., (2000), struggling with the tasks of the competition may enhance the ability of working autonomously while able to conduct research and experiment to solve a problem as well as ability to learn and practice release energy and enhance the student's perseverance. In addition, taking into this challenge in any competition, participants may gain insight into their skills and adaptation especially with dealing to other competitors.

Understanding of cultures and customs of other countries may be one of the factors that contributed since not all the students have the opportunity to work in an international level and at least work with other culture. Also, most of the competition participated are on national or local level and only few international competition was participated. According to Iriste, (2018), diversity in the environment of a higher education institution that transforms and gives opportunity to have international immersion that facilitates the development of the competitiveness of prospective hospitality business managers.

Table 3 shows the Institutional Learning Outcome Developed by Hospitality Management Students by participating in the national and international competitions.

With regards to competent learners, top in the rank is having the determination and sense of urgency (3.35) followed by ability to demonstrate proficiency in the English language(3.27) and demonstrate understanding of responsibility for environmental and expressing awareness of and respect for self and others (3.19). All items are verbally interpreted as agree. Meanwhile least in the rank are applying the basic knowledge and skills in business management, entrepreneurship and finance management(3.18) followed by setting specific- realistic and challenging goals and accomplish tasks and goals with discipline (3.16) and the least is to demonstrate knowledge and skills related to computer (3.10), also verbally interpreted as agree.

Table 3 Institutional Learning Outcome Developed byHospitality Management Students Competent Learners

	wм	VI	Rank
1. I demonstrate proficiency in the English language.	3.27	A	2
2. I can demonstrate knowledge and skills related to computer	3.10	A	6
3. I can apply basic knowledge and skills in busi- ness management, entrepreneurship and finance management.	3.18	A	4
 I can demonstrate understanding of responsibility for environmental and expressing awareness of and respect for self and others. 	3.19	A	3
5. Set specific- realistic and challenging goals and ac- complish tasks and goals with discipline	3.16	A	5
6. I have the determination and sense of urgency.	3.35	A	1
Composite Mean	3.21	A	gree
Committed Achievers			
1. Strive for excellence by providing continuous improvement	3.31	A	1
2. Committed to produce quality output.		A	2
Composite Mean		Agree	
Credible and Values-driven Leaders and Members			
1. I manifest faith in the Supreme Being / Creator	3.39	A	1
 Identify and recognize personal, moral and spiri- tual values and beliefs 	3.30	A	2
3. I can determine decisions, actions and conse- quences after thoroughly examining multiple per- spectives.	3.24	A	4
4. I practice honesty, fairness and transparency in dealing with others.	3.26	A	3
Composite Mean	3.30	A	gree
Collaborative and Caring Team Leaders / Members			
 Identify and apply knowledge of personal and group processes skills in specific tasks in resolving conflicts. 	3.18	A	4

2. I can build relationships to support group effec- tively	3.22	A	3
3. I am open to other's suggestions & feedback for my own improvement	3.33	A	1
4. I am cooperative, flexible & respectful of others and being a team play		A	2
Composite Mean		A	gree
Overall Composite Mean		A	gree

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Legend: 3.50 - 4.00 - SA; 2.50 - 3.49 - A 1.50 - 2.49 - D; 1.00 - 1.49 - SD

Being competent learners, student were able to have that sense of urgency and being responsible enough to the tasked given to them. Also, through the competition, their communication skills were enhance and further develop through the training and practices in preparation for the competition. Hunter-Doniger (2015) affirms that using a sense of urgency as a pedagogical style can bring an additional learning benefit to students. Also, The self-awareness and respect as well as abilities to adapt to change are both an essential component and eventually result to be competitive (Katane & Iriste, 2013).

As to committed achievers, top in the rank is striving for excellence by providing continuous improvement (3.31) verbally interpreted as agree. Meanwhile least in the rank is to be committed to produce quality output (3.28), also verbally interpreted as agree. In LPU Batangas, their aim is always to be first and its goal is to always perform with quality. And so, it is also reflected in the student participation in competition. There is always an urge and pressure on them to always bring home the bacon and aim to perform with quality. Yalabik, et al., (2015) suggest that quality work engagement with three dimensions is a better-fitting mode of competitiveness. The ability to indulge and dig deeper in the positive effect of the work engagement would allow the individual to produce quality output and able to improve in the long run.

In terms of being credible and values-driven leaders and members, top in the rank is to manifest faith in the Supreme Being / Creator (3.39) followed by ability to identify and recognize personal, moral and spiritual values and beliefs (3.27). Both items are verbally

interpreted as agree. One of the core values of a Lycean is to be put God in the center of everything, God centeredness. Possessing that sense of moral and spirituality is always been practices by the student before, during and even after the competition. It is been a tradition for the college to conduct morale booster, where in the competitors were held in one venue to have an orientation on the competition and more importantly pray and lift up to God everything. As stated in the study of Ashar and Lane-Maher, (2004), the most important qualities of a student competing are that consciousness of rationalism Consumption, Spirituality and relationships partnership individualism group manipulation of nature sustainability, continuous learning, that will eventually result into student efficiency improvement.

Meanwhile least in the rank is ro determine decisions, actions and consequences after thoroughly examining multiple perspectives (3.24) verbally interpreted as agree. These perspective are the decision, environmental and firm characteristics are commonly the basis of the decision making. With this, being credible and values driven surely requires one to be observant on the method of their decision making process considering the environment and the firm as well. Elbanna and Child, (2007) suggests that the three perspectives do not contribute in equal measure to explaining strategic decision making, and that the national setting is relevant for the extent to which strategic decision-makers take account of environmental characteristics.

Referring to collaborative and caring team leaders and members, top in the rank is to be open to other's suggestions & feedback for my own improvement (3.33) followed by ability to be cooperative, flexible & respectful of others and being a team player (3.30). Both items are verbally interpreted as agree. One of the institutional learning outcome is collaboration. Working as a team and being a team leader also been manifested in the competition. Students may be competing individually, but still, there student organization assigned to them to assist and help them in the preparation. This is a good practice of the college to also train other students so in the next coming years those who assisted will soon be the on competition. This is similar to the

study of Al Zumor et al., (2013) which indicate the importance and clear advantages of this new experience in broadening students' opportunities and being cooperative and flexible as wells as enriching their sense of camaraderie which will enable them to be open to other's suggestions & feedback for the students' own improvement.

Meanwhile least in the rank is to identify and apply knowledge of personal and group processes skills in specific tasks in resolving conflicts (3.18) verbally interpreted as agree. Such moderating influences can be found in the characteristics of the creative concept, the innovator, the wider organizational context, and national culture when it comes to individual innovation. Knowledge, abilities, and capacity of group members, group tenure, diversity among group members, group processes such as clarifying group goals, engagement, active management of opposing viewpoints, and external demands on groups are all examples of factors that are likely to shape the beneficial and detrimental outcomes of group innovation. (Janssen et al., 2004).

	Competition	Category	Awards Received
	2017		
1	Hongkong Food Expo 2017	Plated Dessert	Silver
	2016		
1	Philippine Culinary Cup 2016	US Pork	Silver
2	Philippine Culinary Cup 2016	US Poultry	Bronze
3	Philippine Culinary Cup 2016	Dress the Cake	Bronze
4	Philippine Culinary Cup 2016	Plated Dessert	Silver
5	Food and Hotel Asia, EXPO,	Amuse bouche	Bronze
6	Food and Hotel Asia, EXPO,	Plated Dessert	Bronze
7	Food and Hotel Asia, EXPO,	Plated Appetizer	Bronze

 Table 4.1 Summary of International Awards

1	Philippine Culinary Cup 2015	US Pork	Silver
2	Philippine Culinary Cup 2015	Plated Dessert	Silver
3	Philippine Culinary Cup 2015	Wedding Cake	Bronze
4	Hongkong International Culinary Classic	Plated Desserts	Gold
1	1 10th ASEAN Skills Competition, 2014 Restaurant Service		6th place
	None None		

Table 4.1 presents the summary of international awards received for the last 5 years. It is evident that most of the competition is related to culinary arts and restaurant service participating in Hongkong Food Expo and Hongkong International Culinary Classic, Philippine Culinary Cup, Food and Hotel Asia Exposition and ASEAN Skills Competition. A total of 13 awards were received which one of those is Gold, 5 silver, 6 Bronze and one qualifying for 6th placer. This is a living testimony that the college continues to take the lead and excelling in the field of hospitality and tourism.

method, educational The education standards, learning outcomes, and instructional activities are all being impacted by changes in the higher educational climate. The socioeconomic and technological climate, global competition, the student market, educators and teaching methods, and the tourism and hospitality industry are all listed as causes of change (Sigala & Baum, 2003). In today's educational world, both academics and professionals in the hospitality and tourism industries understand the importance of experiential learning. As a result, hospitality and tourism educators aim to make their courses more reflective of how hospitality and tourism businesses work by integrating more experience - based learning techniques (Kim & Jeong, 2018). One of this experience-based learning technique is allowing the student to compete and be exposed in the industry and experts in the field of hospitality and tourism.

COMPETITION		CATEGORY	AWARDS RECEIVED	
	2017			
1	NLTSPSO 2017,	Ms. LTSP 2017	Gold, Ms. Photoge- nic,	
2	NLTSPSO 2017	International FA Show- manship 2.0	Silver	
3	NLTSPSO 2017	International Tour Pack- age Proposal	Gold	
4	NLTSPSO 2017	Tourism Slogan & Poster Making	Gold	
5	NLTSPSO 2017	Virtual Tour Guiding (In- ternational)	Silver	
6	NLTSPSO 2017	International Destination Diorama	Gold	
7	NLTSPSO 2017	Destination Marketing	Gold	
8	NLTSPSO 2017	Travel Feature Article Writing	Bronze	
9	NLTSPSO 2017	Rev-Bloom Selfie	Gold	
10	NLTSPSO 2017	Convention Planning	Participants	
		2016		
1	NLTSPO 2016	Virtual Tour Guiding	Gold	
2	NLTSPSO 2016	Destination Marketing	Gold	
3	NLTSPSO 2016	Convention Planning	Gold	
4	NLTSPSO 2016	Mr. LTSP 2016	Mr. LTSP 2016	
5	NLTSPSO 2016	Miss LTSP 2016	2nd runner up	
6	NLTSPSO 2016	International Diorama	Silver	
7	NLTSPSO 2016	Entrepreneurship & Busi- ness Planning	Silver	
8	NLTSPSO 2016	International FA Show- manship 2.0	Silver	
9	NLTSPSO 2016	International Tour Pack- age Proposal	Silver	

Table 4.2 Summary of local Awards 2013-2017

	2015				
1	NLTSPSO 2015	Over-all National Cham- pion			
2	NLTSPSO 2015	Flight Attendant Show- manship	Gold		
3	NLTSPSO 2015	International Convention Planning	Gold		
4	NLTSPSO 2015	Tour Package Proposal	Silver		

	2014			
1	TESDA NSC	Restaurant Service	National Champion	
2	GCC 2014	Creative Bar (with Flairing)	Gold	
3	GCC 2014	Creative Table Setting	Gold	
4	GCC 2014	Grand Bartending	Bronze	
5	GCC 2014	HRM Quiz Bee	Gold	
6	GCC 2014	Creative Bar Chow Challenge	Silver	
7	GCC 2014	Creative Edible Centerpiece	Gold	
8	GCC 2014	Culinary Festival of Regional Cuisine	Silver	
9	GCC 2014	Modern Asia Cuisine	Gold	
10	GCC 2014	Dream Team Challenge	Champion	
11	UFTE	National Over-all 2nd Runner up		
12	UFTE	Kasuotang Pinoy	Gold	
13	UFTE	Cultural Presentation	Silver	
14	Flairtending	Flairtending Challenge	Champion	
15	8 th NFS 2014	Main Course	Gold	
16	8 th NFS 2014	The Entremetier	Silver	
17	8 th NFS 2014	Pantry Chef	Silver (Highest Rank- ing)	
18	8 th NFS 2014	Amuse Bouche	Silver	
19	8 th NFS 2014	Filipino Carver	Silver	
20	8 th NFS 2014	Happy Hour	Bronze	
21	8 th NFS 2014	Dessert Flambé	Bronze	

22	8 th NFS 2014	Edible Art	Bronze
23	8 th NFS 2014	Mocktail Mixing	Bronze
24	8 th NFS 2014	Flaire Tending	Diploma
25	8 th NFS 2014	Coffee Concoction	Diploma
26	8 th NFS 2014	Table Setting	Diploma
27	8 th NFS 2014	Pralines	Gold with Distinc- tion
28	8 th NFS 2014	Chocolate Showpiece	Gold (Highest Rank- ing)
29	8 th NFS 2014	Creative Cake	Gold (Highest Rank- ing)
30	8 th NFS 2014	Wedding Cake	Silver
31	8 th NFS 2014	Petite Fours	Bronze
32	8 th NFS 2014	Cupcakes	Bronze
33	8 th NFS 2014	Ensaimada	Diploma
34	8 th NFS 2014	Cocktail Mixing: Student Di- vision	Silver
		2013	
1	7 th NFS 2013	Main Course	Silver
2	7 th NFS 2013	The Entremetier	Gold (Highest Rank- ing)
3	7 th NFS 2013	Pantry Chef	Silver
4	7 th NFS 2013	Amuse Bouche	Silver
5	7 th NFS 2013	Filipino Carver	Silver (Highest Rank- ing)
6	7 th NFS 2013	Happy Hour	Diploma
7	7 th NFS 2013	Dessert Flambé	Silver (Highest Rank- ing)
8	7 th NFS 2013	Edible Art	Diploma
_			
9	7" NFS 2013	Coffee Concoction	Bronze
10		E for instance of instance	

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9	7 th NFS 2013	Coffee Concoction	Bronze	
10	7 th NFS 2013	Flairtending	Bronze	
11	7 th NFS 2013	Napkin Folding	Silver Ranking)	(Highest

12	7 th NFS 2013	Table Setting	Gold (Highest Ranking)	
13	7 th NFS 2013	Main Course	Silver (Highest Ranking)	
14	7 th NFS 2013	Cocktail Mixing	Bronze (Highest Ranking)	
15	7 th NFS 2013	Floral Centerpiece	Silver (Highest Ranking)	
16	7 th NFS 2013	Pralines	Gold (Highest Ranking)	
17	7 th NFS 2013	Wedding Cake	Silver (Highest Ranking)	
18	7 th NFS 2013	Cup Cakes	Silver (Highest Ranking)	
19	7 th NFS 2013	Chocolate Showpiece	Silver	
20	7 th NFS 2013	Baby Cakes	Silver	
21	7 th NFS 2013	Petite Fours	Bronze	
22	7 th NFS 2013	Ensaimada	Diploma	
23	N L T S P S O 2013	Over-All Champion		
24	N L T S P S O 2013	FA Showmanship	Gold	
25	N L T S P S O 2013	Tour Packages Proposal	Gold	
26	N L T S P S O 2013	Mr. & Ms. LTSP 2013	Best in Tribal Cos- tume	
27	N L T S P S O 2013	Mr. & Ms. LTSP 2013	Mr. Photogenic	
28	N L T S P S O 2013	Tourism choir Competition	1st Runner Up	
29	N L T S P S O 2013	Virtual Tour Guiding (Do- mestic)	Bronze	
30	N L T S P S O 2013	Virtual Tour Guiding (Interna- tional)	Silver	

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31	N L T S P S O 2013	Tourism Quiz Bee	Тор 5
32	N L T S P S O 2013	Parade of Philippines Festivals	Silver
33	8 th Goldi- locks ICD	Mardi Gras/ Debut Cake	Silver
34	Chefs on Pa- rade	Flairtending	Highest Ranking
35	Chefs on Pa- rade	Filipino Market Basket	Bronze
36	Chefs on Pa- rade	Plated Dessert	Bronze
37	Chefs on Pa- rade	Dream Team Challenge Bronze	
38	Chefs on Pa- rade	Modern Contemporary Fili- pino	Bronze

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National League of Tourism Students of the Philippines' Skills Olympics (NLTSPSO)

Goldilocks Inter-collegiate Cake Decorating (Goldilocks ICD); National Food Showdown (NFS);Grand Culinary Challenge (GCC); TESDA National Skills Competition (TESDA NSC)

Union of Filipino Tourism Educators Skills Competition (UFTE)

Table 4.2 presents the summary of local awards received for the last 5 years. A total of 96 awards were received in local competitions from the past five years. 28 Gold, 31 Silver. 18 Bronze. It is evident that most of the competition is related to tourism skills, culinary arts and restaurant service participating in National League of Tourism Students of the Philippines' Skills Olympics (NLTSPSO), Goldilocks Inter-collegiate Cake Decorating (Goldilocks ICD), National Food Showdown (NFS), Grand Culinary Challenge (GCC), TESDA National Skills Competition (TESDA NSC), Union of Filipino Tourism Educators Skills Competition (UFTE).

As the student participate and win in the skills competition, this provides the student an avenue to demonstrate the knowledge and skills attained in the four corners of the classroom and thus giving them an opportunity to showcase to others the best that they can perform. Liu (2020) confirm that students who are able to establish positive social self-efficacy through peer participation and who are likely to compete in potential competitions. In addition, According to Nhung (2020), It is critical to have both quality control and accountability purposes, so higher education institutions must enhance internal quality assurance by enhancing and cultivating among their students professional competence, dedication to provide quality service, and credibility, as well as collaboration in every way. This may be develop through participating into local and international competitions.

Key Result Area	Activity/Strategy	Desired Outcome	
Human Skills			
To enhance the Infor- mation Management Skills of the students To develop among the students the ability to work in an interdisci- plinary team	The faculty may incul- cate in their lecture and classroom activi- ties that will enhance the information man- agement skill and working in a team	All students will be ready and equipped to be competitive profes- sionals in the area of information manage- ment skill and collab- oration.	
Conceptual Skills			
To develop among the students the under- standing of cultures and customs of the other countries To enhance the ethical commitment among the students	The College of may explore to other local and international com- petition other than the skills competition being participated es- pecially in other field such as in Research, Business Plan Presen- tation and other hos- pitality and tourism related competition.	Students will not only be competent in skills, moreover, will appreci- ate other culture and have ethical commit- ment.	

Table 5 Actio	n Plan for	College	Enhancement	Program
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Conclusion

 Human skills are developed such as appreciation of diversity and multiculturalism concern for quality and capacity to learn. There are conceptual skills developed such as capacity for generating new ideas or being creative, capacity to adopt to new situations and be problem solvers.

- 2. As to the institutional learning outcome, through participation local and international competition, being credible and competent learners were enhanced.
- 3. For the past five years, the College of International Tourism and Hospitality Management remains most awarded college in the area of tourism and hospitality skills competition as they participate to numerous local and international competition and achieved various awards.
- 4. An Action plan was able to proposed for enhancement of the college.

RECOMMENDATION

- The college may continue participating local and international skills competition and may consider to equipped the students specifically being competent learner and collaborative member through in campus learning activity and program.
- 2. The college may also host and organize college intercompetition inserted in the courses with the assistance of the student organization.
- 3. The graduates that are previously a student competition may also be tapped as coach or expert to train the current students to compete.
- 4. Future researcher may also conduct similar study on competitiveness or conduct a study on the impact of the competition and awards receive to their work performance.

References

- Al Zumor, A. W. Q., Al Refaai, I. K., Eddin, E. A. B., & Al-Rahman, F. H. A. (2013). EFL Students' Perceptions of a Blended Learning Environment: Advantages, Limitations and Suggestions for Improvement. English Language Teaching, 6(10), 95-110.
- 2. Altunina, V. V. (2011). Training of competitive specialists. Professional Education, 7, 34-35.
- 3. Apuke, O. D. (2017). Quantitative research methods: A synopsis approach. *Kuwait Chapter of Arabian Journal of Business and Management Review*, 33(5471), 1-8.

- 4. Ashar, H., & Lane-Maher, M. (2004). Success and spirituality in the new business paradigm. Journal of management inquiry, 13(3), 249-260.
- Bas Collins, A., Gunduz Songur, A., & Dogan, S. (2021). Marketing tourism and hotel management schools in the context of higher education globalization and student mobility through improved curriculum and industrial training offerings. Journal of Global Education and Research, 5(2), 121-135.
- 6. Bratianu, C., & Vatamanescu, E. M. (2017). Students' perception on developing conceptual generic skills for business. *VINE Journal of Information and Knowledge Management Systems*.
- 7. Buharov, D. V. (2011). Communicative competence in the management of the head of the image of the school as a basis for the competitiveness of the educational institution. *Man and Education*, 2, 135-138.
- Campbell, J. R., Wagner, H., & Walberg, H. J. (2000). Academic competitions and programs designed to challenge the exceptionally talented. International handbook of giftedness and talent, 2, 523-535.
- Carmeli, A., Dutton, J. E., & Hardin, A. E. (2015). Respect as an engine for new ideas: Linking respectful engagement, relational information processing and creativity among employees and teams. Human Relations, 68(6), 1021-1047.
- 10. Chernyshenko, O. S., Kankaraš, M., & Drasgow, F. (2018). Social and emotional skills for student success and well-being: *Conceptual framework for the OECD study on social and emotional skills*.
- 11. Elbanna, S., & Child, J. (2007). The influence of decision, environmental and firm characteristics on the rationality of strategic decision-making. *Journal of Management Studies*, 44(4), 561-591.
- 12. Falciola, J., Jansen, M., & Rollo, V. (2020). Defining firm competitiveness: A multidimensional framework. *World Development*, 129, 104857.
- Hunter-Doniger, T. (2015). An artist-in-residence: Teaching with a sense of urgency. International Journal of Education Through Art, 11(2), 229-243. Wilson, C. K., Matthews, J. I., Seabrook, J. A., & Dworatzek, P. D. (2017). Self-reported food skills of university students. Appetite, 108, 270-276.
- 14. Hutchings, K. (2018). Global ethics: An introduction. John Wiley & Sons.

- 15. Iriste, S. (2018). Prospective managers' of hospitality business competitiveness evaluation and development promotion in the dual study environment of higher education institution. Summary of the doctoral thesis, subfield of university pedagogy for the doctoral degree of pedagogy.
- 16. Iriste, S., & Katane, I. (2017). Students' opinions About The Prospective Hospitality Manager's Competitiveness During Pedagogical Experiment. Research For Rural Development, 2.
- Ivanenko, N. A., Khairova, I. V., Fajzrakhmanova, A. L., Khalilova, T. V., Kharisova, G. M., Lisitzina, T. B., & Shaimukhametova, S. F. (2015). Competitiveness of professional education: Purposes, tasks and factors of its participation in the international educational services market. *Asian social science*, *11*(1), 369.
- Janssen, O., Van de Vliert, E., & West, M. (2004). The bright and dark sides of individual and group innovation: A special issue introduction. Journal of organizational behavior, 25(2), 129-145.
- Katane, I., & Iriste, S. (2013). Students' as Prospective Hospitality Specialists' Competitiveness in Theory and Practice. In Proceedings of the Internetational Scietific Conference Society. Integration. Education (Vol. 1, pp. 119 – 129). Rezekne: RA. DOI: 10.17770/sie2013vol1.158.
- 20. Kim, H. J., & Jeong, M. (2018). Research on hospitality and tourism education: Now and future. Tourism Management Perspectives, 25, 119-122.
- Kim, Y. D., Yoon, S., & Lee, K. S. (2012). International competitiveness of Korea service industry. American Journal of Applied Science, 9, 343-3
- Liu, C. H., Horng, J. S., Chou, S. F., & Huang, Y. C. (2017). Analysis of tourism and hospitality sustainability education with co-competition creativity course planning. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 21, 88-100.
- Liu, I. F. (2020). The impact of extrinsic motivation, intrinsic motivation, and social self-efficacy on English competition participation intentions of pre-college learners: Differences between high school and vocational students in Taiwan. Learning and Motivation, 72, 101675.
- 24. Lugosi, P., & Jameson, S. (2017). Challenges in hospitality management education: Perspectives from the United Kingdom. *Journal of Hospitality and Tourism Management*, 31, 163-172.
- 25. McCallin A. & Bamford, A. (2007). Interdisciplinary teamwork: is the influence of emotional intelligence fully appreciated?. *Journal of nursing management*, 15(4), 386-391.

- Mourtzis, D. (2018, June). Development of skills and competences in manufacturing towards Education 4.0: A teaching factory approach. In International Conference on the Industry 4.0 model for Advanced Manufacturing (pp. 194-210). Springer, Cham.
- Nhung, P. T. T. (2020) Assessing Institutional Learning Outcomes: Implications for Vietnam Higher Education Institutions. Journal of Science: Education Research, 36,(1)1-12
- 28. Northouse, P. G. (2017). *Leadership: theory and practice*.7th Ed. Los Angeles: Sage Publication.
- 29. Northouse, P.G. (2018), Leadership: Theory and Practice, 8th ed., Sage Publication, Thousand Oaks, CA.
- Ohman, J. (2016). New ethical challenges within environmental and sustainability education. Environmental Education Research. 22(6). 765-770 DOI. 10.1080/13504622.2016.1165800.
- 31. Pelau, C., Ene, I., & Pop, M. I. (2021). The Impact Of Artificial Intelligence On Consumers'identity And Human Skills. *Amfiteatru Economic*, 23(56), 33-45.
- 32. Renfors, S. M., Veliverronena, L., & Grinfelde, I. (2020). Developing tourism curriculum content to support international tourism growth and competitiveness: An example from the central Baltic area. *Journal of Hospitality & Tourism Education*, 32(2),
- Riso, E. M., Mägi, K., Vaiksaar, S., Toplaan, L., & Jürimäe, J. (2019). Conceptual skills and verbal abilities were better in children aged six to seven years who were from more highly educated families and attended sports clubs. *Acta Paediatrica*, 108(9), 1624-1631.
- Sigala, M., & Baum, T. (2003). Trends and issues in tourism and hospitality higher education: Visioning the future. Tourism and hospitality research, 4(4), 367-376.
- Yalabik, Z. Y., Van Rossenberg, Y., Kinnie, N., & Swart, J. (2015). Engaged and committed? The relationship between work engagement and commitment in professional service firms. *The International Journal of Human Resource Management*, 26(12), 1602-1621.
- Yoosomboon, S., & Wannapiroon, P. (2015). Development of a challenge based learning model via cloud technology and social media for enhancing information management skills. *Procedia-Social and Behavioral Sciences*, 174, 2102-2107.

Teaching Towards Higher Order Thinking Skills: The case of Professional Study Instructors in Dessie Teacher's College

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Abstract

This research aimed at investigating the extent to which instructors who taught in professional study courses at Dessie Teachers' College implement higher order thinking skills. The research used descriptive research design. Out of fifteen professional study instructors five were included in the study through random sampling technique. The data secured through observation of classroom teaching using observation check list and document analysis using classification quides. In order to validate observation checklist and classification quide, review comments of two instructors who had taught educational objectives for at least five years were used for correction. All the data were treated in table using percentages, mean percentages, mean weights for hierarchical level Bloom's taxonomy of cognitive domain. A comparison of average difference in cognitive weight value for each instructor was employed to analyze the alignment between the cognitive levels of objectives, interaction and assessment. Based on the analysis criteria set for the study, (lower order 20 or lower and higher order 21-50 cognitive weights), the results indicated that instructors emphasize higher levels of cognition in their classroom interaction

(25.29) and lower cognitive levels in their course objectives (16.82) and assessment practices (15.45). The alignment among objectives, classroom interaction and assessment were generally lacking as cumulative mean difference value is (8.27). Finally, the implication of the results on student's learning was discussed and recommendations are forwarded.

Keywords: Cognitive, Instructional objective, Higher order Thinking Skill, Strategy, Assessment, Alignment

1. INTRODUCTION

Education is being fiercely criticized from all sides and it is seen as ineffective, expensive and desperately in need of reforms. Taxes go up and more money is funneled into the educational system, the test scores continue to decline and students who is functionally illiterate still graduate (Joyce, Weil and Calhoun, 2009). How can that be when teaching strategies and learning resources are developed so well? Joyce et al. (2009) further indicated that how teaching is conducted has a large impact on students' abilities to educate themselves. Successful teachers are not simply charismatic and persuasive presenters rather; they engage their students in robust cognitive and social tasks and teach students how to use them productively (p, 20).

In Ethiopia, by virtue of New Education & Training Policy of 1994; Teacher Education System Overhaul of 2003 and Teacher Development Program of 2008, the system of education was gradually pulled out of positivist paradigm of thinking (from which it is predominantly designed) towards constructivist perspectives.

Earlier during these reformations process a Basic Education System Overhaul (BESO) project advisor Leu, (2001) commented on the inadequacy of Ethiopian primary education in the following way:

The kind of simple memorization and recall of facts and information that still forms much of the basis of our curriculum and instructional materials for grade 1-8 is very

damaging intellectually to young learners of Ethiopia. The damage comes from the fact that this approach restricts our young learners to the very most simple and elementary thinking skills and does not help them to develop higher order thinking skills simply memorizing information without being required to do something creative or analytical which it keeps our young students (even the highest achievers) at a very low intellectual level. This is not adequate in the 21st century nor is it adequate for the challenges Ethiopia faces in promoting social and economic development (p.5).

Cognizant of the problem, the government of Ethiopia showed commitment to bring about the necessary change in the education system at least at the policy level. The intention was "rote; passive learning has been replaced with a commitment to active, learner- focused education. This requires a Teacher Education System that develops higher order thinking skills in graduates" (MoE, 2003).

Some studies conducted at national level to see the realization of this demand science then, shows that there was no much change in practical improvement of education on the ground. An explorative research conducted by Amare, Danie, Derebssa, and Wanna (2006) on 'Quality in Education, Teaching and Learning: Perception and Practice' infour major regions of Ethiopia, indicated that how cognitive learning and academic learning, within the active- learning paradigm, are understood and practiced, within pre-service and in-service programs, and throughout the whole system, clearly requires re-examination, clarification, and alignment. Until this is done, great improvements in students are unlikely. Moreover, Piper, (2010) in his study of Ethiopian Early Grade Reading Assessment (EGRA) came up with;

While children attend school for two or three years, a significant percentage is illiterate.... When asked to read a simple passage at a Grade 2 level, many regions had more than 30% of Grade 2 and 20% of Grade 3 unable to do so successfully, with children in Sidama zone and Oromiya region particularly struggling. When it comes to reading comprehension, scores are extremely low, with more than

50% of the children in most regions unable to answer a single simple comprehension question (ES-8).

This is directly a result of how we train teachers in the colleges. More recent educational approaches consider aspects of "high" literacy as essential for tackling the complexities of contemporary life. As information and knowledge are growing at a far more rapid rate than ever before in the history of human kind, the meaning of "knowing" has shifted from being able to remember and repeat information to being able to find and use it effectively (Zohar and Dori, 2003). Due to this and other reasons several reports in our country questioned the quality of college education and identified the need for instructional improvement. The critics of current college education encourage institutions to reflect on that which is currently being done and make changes that would otherwise be overlooked.

Although researches conducted on higher order thinking were lacking in our country so far, quiet a great number of researchers continue to consider the area in various disciplines abroad. Abosalem, 2016 in math and Suwarnaa and Ratnasaric, 2017 in physics are some to be mentioned. Many of them treat components of teaching (objectives, strategies, assessment and their alignment) separately and yet higher order practical problems in the instructional process remain in the demesne of ambiguity.

Unlike those researches mentioned above, this study aimed at considering components of teaching in a comprehensive manner from instructors' performance perspective. Therefore, apart from adding value to solutions for better planning, teaching and assessing higher order thinking skills, it could fulfill the gap of treatment identified so far at national level and abroad.

Therefore, the general objective of this study is to investigate the status of implementation of higher order thinking skills by professional study instructors in Dessie Teacher's College. The specific objectives are to:

1. Identify the levels of objectives frequently used by instructors of professional study courses.
- 2. Examine what cognitive level is expressed through classroom teaching techniques by professional study instructors.
- 3. Find out how much of the assessment items reveal higher order instructional objectives.
- 4. Describe the degree of alignment among objectives, methods and assessments employed by the instructors.

2. LITERATURE REVIEW

2.1 Cognitive Instructional Objectives

According to Huitt (2009), it was in 1948 that a group of educators undertook the task of classifying education goals and objectives. The intent was to develop a classification system for three domains: the cognitive, the affective, and the psychomotor. According to him, work on the cognitive domain was completed in 1956 and is commonly referred to as Bloom's Taxonomy of the Cognitive Domain. Karthwol developed the affective domain in 1964 while Simpson in 1972 developed the psychomotor domain.

Educators have used instructional, or behavioral, objectives for nearly six decades. Robert Mager's little text, "Preparing Instructional Objectives", first printed in 1962, assisted many instructors in formulating and writing objectives. Since then, the use of objectives has become commonplace in education (Palazzi, & Ward, 2008).

The major idea of the taxonomy is that what educators want students to know can be arranged in a hierarchy from less to more complex. The levels are understood to be successive, so that one level must be mastered before the next level can be reached. Huitt (2009) showed that the original levels of Bloom taxonomy of 1956 were revised by Anderson and Krathwohl in 2001. (See table 2.1)

Original Domain	New Domain
Evaluation	Creating
• Synthesis	Evaluating
Analysis	Analyzing

Table 1 Taxonom	y of cognitive	objectives	(Original vs.	New)
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Application	Applying
Comprehension	Understanding
Knowledge	Remembering

Source: Huitt, W. (2009): Bloom et al.'s taxonomy of the cognitive domain.

Reece and Walker (2003) identified two major problems related to the implementation of instructional objectives. These are:

- 1. There is a likely hood for curriculum developers to over concentrate on the low because these are the easiest product objectives to write and assess.
- Teachers tend only to teach the behaviors stated in the specific objectives and ignore the more all- embracing general objectives which precede them.

Many scholars in the field however, emphasize the significance of helping our learners to develop critical thinking and problemsolving skills for the life in the upcoming unpredictable world. Supporting this view, Zohar and Dori, (2003) recommended that teaching for higher order thinking is important for the learning of all students in all academic tracks (p. 149).

2.2 Concept of Higher Order Thinking Skills

Literatures on higher order thinking indicate its difficulty and many aspects as the concept includes critical, logical, reflective, metacognitive and creative thinking terminologies (King, Goodson and Rohani, n. d). Newman's definition of higher order thinking cited in Davies (2008) posited that challenges that require students to interpret, analyze, or manipulate information, because a question to be answered or a problem to be solved cannot be resolved through the routine application of previously learned knowledge. More recently, Chinedu, Kamin, and Olabiyi, (2015) stipulated that higher order thinking skills involve analyzing information to determine the problem, evaluating the problem and creating new workable solutions. The continuous development of it is a direct determinant of continuous practice, and involving in tasks that stimulates the thinking faculties. Although there are debates among scholars as to which levels of Bloom's taxonomy of objectives are considered higher order, those thinking that occurs at the hierarchies of application, analysis, synthesis and evaluation were taken as higher order (Ewing, 2009). Since thinking at these levels are crucial skills in the learning process and in everyday life, offering students opportunities to practice higher-order thinking during class determine to a large extent, the taxonomic levels developed during educational program.

King et al. indicated that higher order thinking skills are activated when individuals encounter unfamiliar problems, uncertainties, questions, or dilemmas. Their effective uses however, are valid within the context of available knowledge and experience as higher order thinking skills are grounded in lower order skills such as discriminations, simple application and analysis, and cognitive strategies and subject matter contents (pp. 32-33).

2.3 Higher Order Teaching Strategies

For King et al lessons involving higher order thinking skills require particular clarity of communication to reduce ambiguity and confusion. Lesson plans should include modeling of thinking skills, examples of applied thinking, and adaptations for diverse student needs. Useful learning strategies like rehearsal, elaboration, organization, and metacognition need to be used by the learners. Direct instruction of information (up to five minutes) should be used rarely and short presentation coupled with guided practice to teach sub skills and knowledge is recommended.

They advised also teacher- and/or student-generated questions about dilemmas, novel problems, and novel approaches which should elicit answers that have not been learned already are effective strategies. Sincere feedback providing immediate, specific, and corrective information should inform learners of their progress.

Small group activities such as student discussions, peer tutoring, and cooperative learning supported with teacher encouragement and scaffolding are important for the development of higher order thinking skills. Moreover, computer-mediated communication and instruction can provide access to remote data sources and allow collaboration with students in other locations. It can be effective in skill building in areas such as verbal analogies, logical thinking, and inductive/deductive reasoning (p: 63).

2.4 Higher Order Assessment Strategies

King et al. (n. d.) suggested that, valid assessment of higher order thinking skills requires that students be unfamiliar with the questions asked to answer and that they have sufficient prior knowledge to enable them to use their higher order thinking skills in doing tasks. With this assumption in mind, three item tools which are useful in measuring higher order skills are (a) selection, which includes multiple-choice, matching, and rank-order items; (b) generation, which includes short- answer, essay, and performance items or tasks; and (c) explanation, which involves giving reasons for the selection or generation responses need to be used by teachers.

King et al further indicated that classroom teachers recognize the importance of having students develop higher order skills yet often do not assess their students' progress. To overcome these problems, they suggest that several performance-based models are available to assist them in teaching and assessing these skills (pp. 99-101).

2.5 Alignment among Instructional Objectives, Teaching Strategies and Assessment Techniques

Assessments should reveal how well students have learned what we want them to learn while instruction ensures that they learn it. For this to occur, assessments, learning objectives, and instructional strategies need to be closely aligned so that they reinforce one another (Nasstrom and Hneriksson, 2008).

Eberly (2012) suggested that to ensure these three components of your course are aligned, ask yourself the following questions:

What do I want students to know how to do when they leave this course? (Learning objectives)

- What kinds of activities in and out of class will reinforce my learning objectives and prepare students for assessments? (Instructional strategies)
- What kinds of tasks will reveal whether students have achieved the learning objectives I have identified? (Assessments)

He further insisted that, if assessments are misaligned with learning objectives or instructional strategies, it can undermine both student motivation and learning. In support of this view (Nasstrom and Hneriksson, 2008) stated that teachers need to be skilled in aligning all of these elements so that the assessment provides an accurate reflection of the student's accomplishments and an effective indicator of the teacher's success.

3. RESEARCH METHODOLOGY

Since the study attempted to secure data on instructors' employment of higher order instructional objectives, in terms of methods, assessment and their alignment, descriptive research design was employed. Descriptive research is usually defined as a type of quantitative research, though qualitative research can also be used for descriptive purposes (Bautista, and Pastorfide, 2019). Similarly, Nassaji (2015) stated that this research design is more concerned with what rather than how or why something has happened. In such research, the data may be collected qualitatively, but it is often analyzed quantitatively, using frequencies, percentages, averages, or other statistical analyses to determine relationships (p, 129). It is also useful where it is not possible to test and measure the large number of samples needed for more quantitative types of experimentation (Bias, D. Research Bias). Hence, the design was used for it enable flexibility to manipulate both large and small sample size or quantitative and qualitative data analysis so as to have a the necessary understanding of what is going on in the teaching learning process.

3.1 Population and Data Sampling Technique

The target population in this study was professional study instructors in the college. There are 15 instructors in the

department and all are at second degree level of qualification. As their level of qualification is alike, five instructors were randomly selected from the department. Two sessions of each instructor were observed through intra- instructors' supervisory mechanism. The lesson plans of these particular sessions and 50 additional plans from a total of 220 lesson plans prepared by the sample instructors for the semester were randomly selected. Instructors made assessment items of different tools (1 quiz, 2tests, 1assignment and 1exam) from sample instructors where altogether contribute to nearly 100% of students grade were purposefully included in the study.

3.2 Data Gathering Technique and Instruments

In order to get the cooperation of the department, I have got the opportunity to brief my research proposal on the occasion of the department meeting held on 24th of March 2012. After randomly selecting five instructors and orienting them on how to use the classroom observation checklist, I arranged a supervisory program in which each instructor supervises two instructors teaching their lesson in the classroom.

While attending each instructor's class, supervisors tick the frequency of observable teacher and student's nature of interaction in every five-minute interval for 50 minutes long lesson in line to the behaviors indicated in the observation checklist for the six levels of Bloom's taxonomy of objectives. In addition to observation checklist, three types of classification guide were used for the lesson objectives, items of (Quizzes, tests, exams) and assignments and project works. The classification guides were used to classify the cognition level reflected by the objectives and assessment items.

All the instruments were adapted from Gronlund (1990) Measurement and evaluation in teaching 6th Ed. Before using all the instruments, two instructors, who had taught instructional objectives for at least 5 years in the college and would not participate in the research as a data source, reviewed the observation check list and classification guides for their appropriateness and relevance to Bloom's Taxonomy of objectives. Based on the feedback of the reviewer's necessary amendments were made to all the instruments.

3.3 Methods of Analyzing Data

After observations, first the frequencies of behaviors observed across all cognitive levels for each instructor were totaled and mean of the two observations is obtained. Then frequencies of performance within each cognitive level were divided by the total frequencies and multiplied by hundred to acquire percentages of classroom interaction at each cognitive level. Then the obtained percentage for every instructor was multiplied by the corresponding weight value and summed up to get cognitive weight. Mean percentage is obtained by adding all instructors' percentage value across the cognition level and dividing it by the total number of sample instructors.

During document analysis, similar procedures were utilized for the rating of objectives and assessment items. First the researcher coded all instructional objectives as well as assessment items according to the classification guide to calculate percentage of representation at each level of objectives. To create a single cognitive score for course objectives, and course assessments, weighted values assigned to each level of cognition are multiplied by the corresponding percentage of representation, and a total cognitive weight was determined.

Several studies indicate that the validity of cognitive weighting system is consistent with hierarchical nature of Bloom's taxonomies. The hierarchy suggests that a subsequent level of cognition receive a higher cognitive weight than its preceding level (Ball, 2005). He further explained that the percentage of instruction occurring at each level of cognition was multiplied by the cognitive weighting value for each level (Knowledge .10; Comprehension .20; application .30; Analysis .40, synthesis .50, evaluation .50 as Synthesis and Evaluation levels of the taxonomy should receive equal weights due to the lack of empirical evidence to validate the Evaluation level as a higher than the Synthesis level on the hierarchy. According to Ball, (2005) cognitive scores of each instructor for Classroom interaction, course objective

and assessments were calculated by multiplying the percent value of each cognitive level by its respective cognitive weight. The values were then summed across each of the six cognitive levels to attain a total cognitive weighted score. The maximum cognitive weighted score that could be attained for objectives, interaction, or assessments was 50. As such, a cognitive weight of 20 or lower suggests performance mainly at the knowledge and comprehension levels of cognition, or lower order thinking. Furthermore, cognitive weighted scores of 21-50 indicate performance mostly at the application, analysis, synthesis, and evaluation levels of cognition, or higher -order thinking (p. 12).

Descriptive analysis including mean percentages was utilized to assess the cognitive levels, towards which instructional objectives were geared, classroom interactions were carried out and assessments were directed.

Alignment is the connection between learning objectives, learning activities and assessment. This connection can be understood as similarity of cognitive weight values exist between objectives, interaction and assessment for each instructor. Therefore, the alignment among the three major components of teaching could be determined by comparing and contrasting the average difference in cognitive weight values calculated for each instructor independently and/or in common. Finally, "the larger the averages difference in cognitive weights value, the lower the alignment between components of teaching and vice versa" logic was used to judge the alignment level. The formula used for calculating average difference is:

$$AD = \left(\frac{d_1 + d_2 + d_3}{n}\right) \text{ where,}$$

AD- Average difference

d1- difference in cognitive weight values between objectives and interaction

d2- difference in cognitive weight values between objectives and assessment

d3- difference in cognitive weight values between interaction & assessment

n - Total number of differences

Table 3.3.1	Alignment Level A	Nalysis Taxonomy

Average Cognitive weight value difference	Degree of Alignment
Between 0.0 -0.5	Very high
Between 0.6-1.0	High
Between 1.1-1.5	Moderate
Between 1.6-2.0	Low
Between 2.1-2.5	Very low
> 2.6	No alignment

N.B. – with all decimal numbers between the ranges rolled to the nearest

4. RESULT& DISCUSSION

Research objective one was to identify the levels of objectives frequently used by the instructors of professional study department.

Table 4.1 Cognitive Level Expressed through Instructional
Objectives

	Instructors								
Cognitive levels	Wt. value	1	2	3	4	5	M%		
Knowledge	0.10	23.1	44.4	56.3	90.0	61.1	55.00		
Comprehension	0.20	53.8	44.4	31.3	10.0	23.1	32.50		
Application	0.30	7.7	11.4	6.2	0.00	0.0	5.06		
Analysis	0.40	15.4	0.0	6.2	0.00	0.0	4.32		
Synthesis	0.50	0.0	0.0	0.0	0.00	0.0	0.00		
Evaluation	0.50	0.0	0.0	0.0	0.00	15.8	3.16		
Cognitive Wt.					11.00		16.82		

As shown above, none of the instructors in this study wrote objectives at the synthesis level of cognition (Table 4.1). Furthermore, application, analysis, and evaluation level objectives represented at an average of 5%, 4%, and 3% for all

instructors respectively. The lower level of cognition account for 77% for Instructor 1, 89% for Instructor 2, 87% for Instructor 3, 100% for Instructor 4, 84% for Instructor 5. On average, 55% of instructional objectives were at the knowledge level and 32% were at the comprehension level for all instructors. Only instructor 1 was performing well above lower-level cognition (21.54) cognitive weight. However, the overall performance of all instructors with regard to writing instructional objectives for their lesson is 16.82 as an average cognitive weight value which is lower order thinking. This agrees with the major problem identified by Reece and walker (2003) teachers tend only to teach the behaviors stated in the specific objectives and ignore the more all- embracing general objectives which precede them (p. 215).

Research objective two was to describe the levels of cognition expressed by instructors through classroom interaction.

Instructors							
Cognitive levels	Wt. value	1	2	3	4	5	Μ%
Knowledge	0.10	40.0	27.3	40.0	10.0	20.0	27.46
Comprehension	0.20	30.00	26.4	40.0	10.0	0.0	21.28
Application	0.30	30.0	19.1	20.0	20.0	80.0	33.82
Analysis	0.40	0.0	9.1	0.0	20.0	0.0	5.82
Synthesis	0.50	0.0	9.1	0.0	20.0	0.0	5.82
Evaluation	0.50	0.0	9.1	0.0	20.0	0.0	5.82
Cognitive Wt.		19.00	26.48	18.00	37.0	26.0	25.29

 Table 4.2 Cognitive Level Expressed through Classroom

 Interaction

As indicated in (Table 4.2), the higher cognitive level of application was 30% for instructor1, 19% for instructor 2, 20% each for instructor 3 and 4 and 80% for instructor 5. The analysis, synthesis and evaluation were not expressed by instructors 1, 3 and 5. Cognition level of 34% for application and nearly 6% each for analysis, synthesis and evaluation expressed through classroom interaction by all the instructors. Conversely, an average 27%

and 21% of the classroom interaction expressed knowledge and comprehension levels respectively for all instructors. The lower cognitive levels of knowledge and comprehension together account for 70% of the classroom interaction for Instructor 1, 53% for Instructor 2, 80% for Instructor 3, 20% each for both Instructors 4 and 5. All together the representation of higher order to lower order cognition level is 52% to 48%. The average performance of all instructors 2, 4, and 5 performing exceedingly high above lower-level cognition (26.48, 37.0 and 26.0) respectively.

The reasons for instructors to teach outside the box for which they have not been prepared might be either it is due to a sudden recalling of the purpose of supervision or it might be unintentional. This confirms with the idea mentioned by Yen, and Halili (2015) some teachers may be unaware that they have been unconsciously integrating higher order thinking in their instruction all this while.

Research objective three was to describe the extent to which instructors made assessments items reveal higher order thinking skills.

Instructors							
Cognitive levels	Wt. value	1	2	3	4	5	M%
Knowledge	0.10	66.7	69.6	63.9	62.5	74.0	67.34
Comprehension	0.20	31.3	26.8	21.3	6.3	24.6	22.06
Application	0.30	2.1	3.6	3.3	9.4	1.4	3.96
Analysis	0.40	0.0	0.0	4.9	6.3	0.0	2.24
Synthesis	0.50	0.0	0.0	3.3	15.6	0.0	3.78
Evaluation	0.50	0.0	0.0	3.3	0.0	0.0	0.66
Cognitive Wt.		13.56	13.40	16.90	20.65	12.74	15.45

Table 4.3 Cognitive Level Expressed through Assessment Items

In table (4.3) above, the analysis, synthesis and evaluation level of cognition were not represented in any of the assessment's tools for Instructors 1, 2, and 5. However, analysis and synthesis together account for 8% and 22% for instructors 3 and 4 respectively.

Conversely, an average of 67% and 22% of assessment items were written at the Knowledge and comprehension level respectively for all instructors. The lower level to higher level representation of assessment items was 89 to 11 in mean percentage. The overall performance of assessment by all instructors is 15.45 in average cognitive weight value which is the lowest performance compared to objectives written & classroom interaction (16.82 and 25.29) respectively (Table 4.1 and 4.2 above). The reason here might be attributed to teachers' lack of knowledge, skill & commitment in preparing and using different assessment models but For King et al, classroom teachers recognize the importance of having students develop higher order skills yet often do not assess their students' progress (pp. 99-101).

Research objective four was to determine the alignment level among course objectives, classroom interaction, and assessments required in professional study courses.

Instructional		Cumulative				
Components	1	2	3	4	5	cognitive mean of perfor- mance
Objectives	21.54	16.74	16.23	11.00	18.63	16.82
Interaction	19.00	26.48	18.00	37.0	26.0	25.29
Assessment	13.56	13.40	16.90	20.65	12.74	15.45
Average diff. in cognitive weight	5.29	8.72	1.18	17.33	8.84	8.27
Extent of align- ment	Not aligned	Not aligned	Low level align- ment	Not aligned	Not aligned	Not aligned

 Table 4.4 Extent of Alignment among Objectives, Interaction

 and Assessment for Instructors

As observed in (Table 4.4) above, a comparison of average difference in cognitive weight value for each instructor between instructional objectives, interaction and assessment nature was used to determine the degree of alignment of instructors' performance.

The average difference in cognitive weight value among objectives, interaction and assessment is 5.29 for instructor 1, 8.72 for instructor 2, 17.33 for instructor 4 and 8.84 for instructor 5. These comparisons indicate that there is no sign of alignment in the instructional process for the instructors. However, as the average difference in cognitive weight value for Instructor 3 is 1.18, we can say there is low level of alignment between instructional components for the instructor. Taking the overall performance of instructors in this regard, the cumulative mean difference is 8.27 which mean that there is no behavior of aligning instructional components for all the instructors. A misalignment of the mean cognitive weighted scores in the instructional process implies that according to Blank, De Las Alas and Smith (2007) the course may be fragmented and ineffective, students receive mixed message about what they should learn, students spend time on activities that do not lead to intended goals and you may overestimate or underestimate the effectiveness of instruction (P. 2).

5. CONCLUSIONS AND RECOMMENDATION

5.1 Conclusion

Based on the analysis criteria set for the study, (lower order 20 or lower) and higher order levels 21-50) cognitive weights), the results indicated that there was higher level of cognition in classroom interaction (25.29), whereas lower levels of cognition with regard to course objectives (16.82) and assessments (15.45). The alignment in the instruction process was almost lacking with cumulative mean difference value of (8.27). This implies that students were not encouraged to move beyond mere recall and recognition of information and as Eberly (2012) mentioned their motivation and learning were also undermined due to lack of alignment among what they were intended to learn, what they learned and what they were assessed.

This indicates that the instructors in professional study department of the college were in short of implementing the guiding philosophy of the government which the Ministry of Education set forward "rote; passive learning has been replaced with a commitment to active, learner- focused education. This requires a Teacher Education System that develops higher order thinking skills in graduates" (MoE, 2003) and the theories of learning accepted in the 21stcentury (higher order thinking Skills).

5.2 Recomendation

In order to improve teaching towards higher order thinking skill, instructors of the department need to learn and exercise the following recommendations throughout their carrier.

- 1. Instructors have to move away from teaching the behaviors stated in the specific objectives to the more all- embracing general objectives which precede them. Knowing this they have to exercise writing instructional objectives at application, analysis, and synthesis and evaluation level in their lesson plan and implement it with its broader outcome in their mind.
- 2. Instructors need to include modeling of thinking skills and examples of applied thinking into their lesson for diverse student needs. Learning strategies like rehearsal, elaboration, organization, and metacognition have to be entertained by the learners.
- Instructors need to exercise preparing questions for assessment for which students were unfamiliar but have sufficient prior knowledge to answer. These item tools could be prepared in various forms of (selection, generation and explanation).
- In order to develop the culture of aligning instruction, instructors need to correlate the learning objectives, instructional strategies and assessment techniques during planning, implementation and evaluation of student's learning.
- 5. Moreover, the college needs to invite professionals in the area from universities to train instructors of the department as well as the college on how to become reflective teacher in relation to improving their teaching performance as higher order thinking require holistic approach to be successfully effected in the college.

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References

- 1. Abosalem, Y. (2016). Assessment techniques and students' higherorder thinking skills. International Journal of Secondary Education, 4(1),
- Amare A., Danie D., Derebssa D., & Wanna L. (2006): Quality in Education, Teaching and Learning: perception and practice: Ethiopia, Addis Ababa University.
- Anderson, L. W., & Bloom, B. S. (2001). A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives. Longman,.
- Ball, A. L., & Garton, B. L. (2005). Modeling higher order thinking: The alignment between objectives, classroom discourse, and assessments. Journal of Agricultural Education, 46(2), 58-69.
- 5. Bautista, A. G. M., & Pastorfide, D. D. (2019) North Asian International Research Journal of Social Science & Humanities.
- 6. Bias, D. Research Bias. Published on Explorable.com (<u>https://explorable.com</u>)
- Blank, R. K., De Las Alas, N., & Smith, C. (2007). Analysis of the quality of professional development programs for mathematics and science teachers: Findings from a cross-state study. Washington, DC: Council of Chief State School Officers, 25, 2017.
- Chinedu, C. C., Olabiyi, O. S., & Kamin, Y. (2015). Strategies for improving higher order thinking skills in teaching and learning of design and technology education.
- 9. Davies, A. (2008). Textbook trends in teaching language testing. Language testing, 25(3), 327-347.
- 10. Davies, B. (2004). The relationship between teacher efficacy and higher order instructional emphasis. In Annual Meeting of the Australian Association for Research in Education, Melbourne, Australia..
- 11. Eberly,E. (2012): Why should assessments, learning objectives, and instructional strategies is aligned? Retrieved April 28, 2012 from: http://www.cmu.edu/teaching/assessment/basics/alignment.html

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- 12. Ewing, J. C., & Whittington, M. S. (2009). Describing the cognitive level of professor discourse and student cognition in college of agriculture class sessions. Journal of Agricultural Education, 50(4), 36-49.
- Huitt, W. (2009): Bloom et al.'s taxonomy of the cognitive domain. Educational Psychology Interactive. Valdosta, GA: Valdosta State University.
- 14. Gronlund, N. E. (1990). Measurement and evaluation in teaching 6th ed.
- 15. Joyce, B., Weil, M., & Calhoun, E. (2009). Models of Teaching. Boston: Allyn Bacon.
- 16. King, F.J., G.L.& Rohani, F. (n. d): Higher Order Thinking Skills: Definition, Teaching Strategies and Assessment. (Electronic Version) A publication of the Educational Services Program, now known as the Center for Advancement of Learning and Assessment www.cala.fsu.edu
- 17. Leu, E. (2001): Active Learning in the New Curriculum. Tigray: Basic Education System Overhaul/BESO/ Project.
- 18. MoE (2003): Teacher Education System Overhaul/TESO/. Addis Ababa.
- 19. Nassaji, H. (2015). Qualitative and descriptive research: Data type versus data analysis.
- Näsström, G., & Henriksson, W. (2008). Alignment of standards and assessment: A theoretical and empirical study of methods for alignment. Gronlund, E. N & Brook hart, S. M. (2008): Gronlund's writing Instructional Objectives. 8thEd. New York: Macmillan Publication co., Inc.
- 21. Palazzi, D. L., & Ward, M. A. (2008). The Clinician-Educator's Handbook.
- 22. Piper, Benjamin (2010): Ethiopian Early grade Reading Assessment. Data Analytic Report:
- 23. Language and Early Learning Office of Education. USAID/ETHIOPIA.
- 24. Reece, I., & Walker, S. (2003). Teaching, training and learning. Sunderland: Business Educator's Publishers.
- Suwarna, I. P., Handayani, Y., & Ratnasari, N. (2017). Higher Order Thinking Skills (HOTS) Ability of Student High School, Collage, and Physics Teacher on Physics Lesson Materials. In International Conference on Education in Muslim Society (ICEMS 2017) (pp. 317-320). Atlantis Press.
- 26. Yen, T. S., & Halili, S. H. (2015). Effective teaching of higher order thinking (HOT) in education. The Online Journal of Distance Education and e-Learning, 3(2), 41-47.
- 27. Zohar, A., & Dori, Y. J. (2003). Higher order thinking skills and lowachieving students: Are they mutually exclusive? The journal of the learning sciences, 12(2), 145-181.

The Impact of Social Media Marketing on Consumer Behavior in Saudi Arabia Tourism Industry

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Keywords

Social Media , Consumer Behavior , Tourism Industry

PURPOSE

The paper studies the role of social meida marketing in consumer behaviour on Saudi Arabean tourism industry . The main attention is paid to the fact that social media marketing engages the consumer and determine the different tools of social media in tourism development .The Study was conducted in Saudi Arabia Tourism market .The results showed that 92.4% of the customer purchase intention has been explained by Social Media Marketing . The results are satistically significant . The objectives of this study was to investigate the influence of social media marketing on consumer behavior , to drive tourism buseness growth For this purpose, a research questions is raised :

How marketers can use social media to influence consumer behaviour?



RESEARCH METHODS

Qualitative and quantitative methods have been chosen for studying the and respectively, the study consisted of two steps. At the first step were selected 30 local Travelling Agencies for the gualitative survey and hypothesis formulation. In the second step were conducted online and face to face survey respondents through the country. A systematic random sampling method was used and the survey was carried out to 600 respondents by suing a well-structured guestion are .280 men and 320 women were participated in the survey. The confidence interval is 95 % and standard deviation is 1,96%. The questionnaire included personal characteristics of the respondents and 18 statements regarding to the impact of social media marketing in promoting tourism industry in Saudi Arabia. A five point Likert scale was employed to measure the consumers attitude and perception toward social media (Malhotra, 2008) the data collected for the study were analysed by using SPSS version 21.0. Numerous hypotheses were formulated, focusing on the relationship between social media and buying behaviour of Saudi consumers.

TOTAL POPULATIONS OF SAUDI ARABIA	34.54 MILLION	100 %
INTERENET USERS IN SAUDI ARABIA A	32.23 MILLION	93.31 %
ACTIVE SOCIAL MEDIA USERS	25 MILLION	72.38 %

FIGURE	1.1 SAU	DI ARABIA	SOCIAL	MEDIA	USERS	2020

RESULTS AND DISCUSSION

Marketing study showed that among the social media platforms, You Tube is mostly spread in Saudi Arabia. Its used by (76 %) of respondents. Then follows Instagram (65%). Facebook (62%) . The study reveals, that social media marketing activity of travel agencies increase consumer's internet and reliability which leads to customer satisfaction. The result approves, that social media marketing impact on consumer's satisfaction. Consumer included in the sample survey from Saudi Arabia Tourism Indusrty use a lot the interent and the social media , and spend considerable time (most of them spend more than 5 hours per day). The vast majority of respendents have interent acess via mobile and booked their holiday bookings using social media . The most used social media in Saudi Araba are social networks (Instgram, Twiter, Snapshat and facebook, while the least are Blogs and the Microblog. This high share of using the social media by consumers in Saudi Arabia is also impacting their behaviour as consumers, affecting each of the stages of consumer decision making process, the influential factors of this process (motivation, attention, learning, memory).

IMPLICATIONS

The consumers of social media in Saudi Arabia are found to be greatly attracted towards social media notifications, information, current affairs ,news , and entertainments . Thus for social media marketers, its recommended to keep their social media activities .Thus the future researchers have loads of opportunities to explore this subject further. Present study investigated the impact of social media marketing on consumer behaviour . A good number researches have been done on the topic specially in developed countries , However presently the social media have gained tremenfous popularity in developing countries including the Middle-East in general and Saudi Arabia in particular . infact social media marketing should be appropriately planned and implemented to increase the sales and profit . . Importantly , social media marketing influneces different secotrs shuch as travel and tourism .

References

- 1. Carr,C.T and Hayes , R>A(2015) Social media :Defining, Developing, and diving. Atlantic Journal of communication , 23(1),46-65.
- 2. Saudi Arabia Travel agents (2019) n Saudi Arabian Tourism in Figures :Structure and industry Data
- Akhtar, N. Tahir. M. and Asghar Z(2016). Impact of Social Media marketing on consumer Purchase intention. International Review of Social Science .4(10). PP385-394.
- 4. Gros.C.(2012) . The Influence of social media on consumers during their purchase decision-making process and the implications for marketers Published thesis (Master Degree). Dublin Business School.

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- Zhung .B(2017) Influence of social media marketing brand loyalty and eWOM towards consumers purchase intention. Published thesis (Master degree). University Tunku Abdul Rahamn
- Duangruthai Voramontri , . Impact of social media on Consumer Behavior . Article in international Journal of information and decision Science July 2018 .
- 7. Daiana Tont, Social Media Marketing : a gateway to consumer's wardrobe ?, Master Thesis 2019.
- 8. M.Nick Hajli, A study of the impact of social media on Consumers , Paper , Birkbeck University of London .2013 .
- Gillin P Secrets pf Social Media Marketing : new influence 2007 P:25-30
- 10. Maryam Lashgari , Digital Marketing Strategy , Doctoral Thiess , December 2017
- 11. www.tourismkeys.ca/blog/tag/social -marketing/ socal media for tourism.vesion 5 last updated September 2019
- 12. McDougall, Making Social Media Marketing Campaign Accountable , www.sinotechblog.com.en.2017
- 13. Elizabith Abiola , Effect of online travel bookings and social media on tourism , Article in Advance Journal of Social Science , July 2019
- 14. Charita Jashi , Significance of Social media marketing in Tourism , conference paper May 2013 ,
- Aldawood Abdullah , Decoding the Saudi Arabian Travel and Tourism Industry , Report December 2019 .Gergely Rathony , Influence of Social media , Article in Applied studies Commerce March 2013 .
- 16. Fotis , J, Buhalis , D. Rossides N . (2012) : Social Media use and impact during the holiday Travel Planning process 2012.
- 17. Travel and Tourism , World Travel Tourism Council , 2012
- 18. Chaves , D, and law , R(2008) Progress in information technology and tourism management

Impact of Communiqué in Delivering Inquisitive Business Story Telling Through Data Science

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Data science and machine learning the vastly acclaimed domains of computer science provides a foundation for business growth, calculating the reduction in cost and risk; even the new business model creation. Data science and machine learning have a profound impact on a business, and are becoming critical for differentiation and sometimes survival especially in these stagnant times of Covid 19 when the only information is stored in various software clouds in the form of data that needs immediate attention for analysis, research and business setups. The data explosion is no more observed on the skyline, it is here virtually available 24/7. Only a few years ago, entrepreneurs talked about the scarcity of data. Now, the Internet of Things and wearable technology have turned people and devices into data-generating machines that can yield a treasure trove of insights about people and organizations. And data science is the most effective way to derive value from all of these data sources.

There has never been a better time to move your organization forward with data science. Open-source software tools afford users new levels of power and agility and can meet analytical demands in ways many traditional solutions cannot. Massive datasets are widely available from government agencies, non-profit organizations and academic institutions. Powerful capabilities such as machine learning are within reach for just about any organization with the right people, data and tools. All of these advancements offer tremendous opportunity.

DATA SCIENCE FOR ALL – EMPOWERING BUSINESS WITH VI-SUAL APPROACHES TO DATA SCIENCE

Data is an unstoppable force that is transforming industries before our eyes. Decision-makers now have access to more data from more sources than ever before, including IoT, weather, mobile and traffic data. Organizations that can uncover new trends and opportunities in big data and apply that knowledge to differentiate are the only ones to lead in their sectors.

Data science is the key to turning the data deluge into actionable insights. However, as more businesses strive to become data-driven, they are finding that a shortage of data science skills is preventing the organization from becoming more data literate and benefiting from data science insights. For this reason, a growing number of organizations are seeking to enable more knowledge workers by providing a platform that is more intuitive to use, scalable across a variety of data science projects and open to other tools, including open-source projects.

RISE OF THE DATA SCIENTIST

Data science today is about much more than just technology; it is about people with different skills, backgrounds and roles that need to collaborate by solving problems for the good of the organization.

The worldwide shortage of skilled data scientists is well known and has given rise to a group of analytic professionals often referred to as citizen data scientists or citizen analysts. These individuals are already working in core business areas such as marketing, finance, human resources or operations, and are being tasked with challenges such as:

- Increasing revenue by adding new customers or selling targeted offers to existing customers
- Improving cross-sell rates during call centre interactions
- Decreasing risk and costs by identifying fraudulent claims before payment
- Servicing a component in a production line to minimize downtime

While these analysts have extensive business knowledge, they are not necessarily skilled in mathematics, statistics or predictive modelling. That means there is a growing need for businesses to adopt solutions that are intuitive and approachable so these users can explore data more easily, find answers quickly and share results on their own.

At the same time, companies need to give data scientists and other analytical professionals the power and flexibility to create the best models, using their choice of either visual interfaces or programming for increased productivity.

MACHINE LEARNING – THE COMPETITIVE ADVANTAGE FOR BUSINESS

Artificial intelligence (AI), a scientific discipline that empowers machines to comprehend, learn and act, is transforming and reinventing how businesses operate. When implemented as part of a holistic data science strategy, AI helps organizations transform customer experiences, improve productivity, lower costs and create new growth opportunities. The business case for machine learning (ML) is compelling. A number of factors have converged to make ML a prerequisite for business success, including increased data-processing power, improved access to big data and advancements in the Internet of Things.

Machine learning enables companies to optimize core processes while improving customer experience and increasing employee productivity. Most organizations use rule-based processing to automate tasks in departments such as finance and human resources. Much of the value machine learning offers lies in its ability to identify patterns humans cannot detect and do so at scale. It can also simplify, reduce risks caused by humans including insider threat, and streamline business processes. To derive greater value from machine learning, both humans and machines need to work together. Furthermore, data access and models must continuously improve through experimentation and training in order to produce intended results and help increase return on investment. Without data scientists and their knowledge, many issues surrounding the digital business age will remain unresolved – possibly even untouched. Data scientists frame complex business problems as machine-learning or operations research problems. Data scientists know which new information sources should be collected or acquired from external sources, to solve old and pivotal business issues in radically new ways. Some of those iconoclastic ideas can find their way to the most unexpected places. There are many more examples of disruptive projects and new business moments that are made possible through data science. Major organizations like Amazon, Google, Airbnb, Uber and Facebook persistently work on introducing new systems to collect comparatively valuable information. This enables them to create better or new services.

ROLE OF EFFECTIVE COMMUNICATION

Data-driven insights are driving a new wave of business intelligence, helping move the needle with quick business impact. Analysts take all efforts required to communicate the tangible data insights to the stakeholders with an avidity, passion and enthusiasm.

Here, we need to understand the need and requirement of mastering the effective verbal and nonverbal clues. Of course the Data science and machine learning are critically technical still it has to be complimented with good presentation skills otherwise the crucial technical data would always remain unrevealed to the human mind. Even the neurological researchers believe that when the user is shown a visualization of data, it takes just a few seconds for the human eye and brain to process the pre-attentive visual properties of an image. It is an unprecedented situation that every human mind loves an interesting story and finds it easy to grasp the difficult concepts if summarized and presented effectively utilizing all parameters of verbal and non-verbal clues in the form of a narration.

IMPACT OF GOOD COMMUNICATION

As data is already everywhere and consistently growing in volume and complexity, so data science problems are becoming

increasingly prevalent. Good Communication helps extend data science and analytics beyond the domain of the data scientist by placing capabilities like predictive modeling and machine learning within reach of just about anyone.

It combines ease of use, power and flexibility to extend the ability to make data-driven decisions more widely than ever before and empowers the data scientist at all skill levels to:

- Intuitively visualize each step in the analytical process as part of a stream: analysts and business users can easily add expertise and business knowledge to the process.
- Transform data intelligibly into the best format for the most accurate predictive models
- Analyze data, identify fixes, screen out fields and derive new attributes with just a few clicks
- Identify the techniques that are best suited to solve problems and quickly create the best-performing model or models in a single step
- to amplify the power of analysis

SUCCEEDING WITH DATA SCIENCE TAKES A HOLISTIC APPROACH

Succeeding with data science takes a holistic approach. Today, during Covid 19 Lockdown all around the globe, from large enterprises to small businesses, nearly every organization recognizes the benefits they can achieve with data science. Whether looking for patterns in financial transactions to better detect fraud, mining social media posts for customer sentiments or using telecommunications data to improve cell phone networks, business leaders realize their data holds the key to competitive advantage.

However, one of the biggest challenges businesses face is finding the right way to transform their mountains of data into insights and then into action. Data science is the discipline by which organizations can attain unprecedented competitive advantage. Comprising capabilities such as statistics, mathematics, predictive analytics and machine learning, data science can speed analysis and time to insight by empowering users to identify patterns, trends and anomalies in extremely large datasets.

With all of the advantages data science has to offer, it's no surprise that many organizations are eager to get started.

Once business goals are defined, the entire data lifecycle and delivering insights across the organization has to be understood. Taking this holistic approach to analytics and data science will be an important step in addressing technical challenges and reaching the business goals.

THE ART OF STORYTELLING IN ANALYTICS AND DATA SCIENCE

The idea of storytelling is fascinating, like taking an idea or an instance, and cracking it into a story. It provides life to the idea and makes it significantly remarkable. The art of storytelling is simple and complex both it is hand in hand. Such stories incite thought process and bring out insights that could not have been understood or explained otherwise. It's often overlooked in data-driven operations as we believe its inconsequential task. Where we fail to understand is that the best stories not offered well generally end up being inoperable!

The single most important thing you can do to dramatically improve your analytics is to have a story to tell. A flow that you can generate can have a lot of friction in your end result.

Aristotle's classic five-point plan that helps deliver strong impacts is:

- 1. Deliver a story or statement that arouses the audience's interest.
- 2. Pose a problem or question that has to be solved or answered.
- 3. Offer a solution to the problem you raised.
- 4. Describe specific benefits for adopting the course of action set forth in your solution.
- 5. State a call to action.

Storytelling is more than what it has been used for. It can uncover insights from the data that have been missed before.

ELEMENTS OF DATA-STORYTELLING

- 1. Understanding the Stakeholders Expectations Understand the user skill levels and their expectations, what KPIs they are tracking, what kind of analysis they want.
- Setting the context for the story Context helps to explain the backdrop and set the mood for the story, helping elevate the user interest, bridge the gap, create interest and communicate your point of view more effectively.
- 3. **Defining the Story Lifecycle** All stories have certain universal elements in common characters, conflicts and redemption arc which help make the story engaging and impactful.
- 4. Mapping the Story to the Visual –There is a helpful rule of thumb when selecting the charts and graphs on your dashboards. All visualization should be treated as an answer to a question. The whole dashboard should also be the answer to a question which can be answered at a glance. Use principles of visual hierarchy to arrange and place visuals.
- 5. Story delivery and walkthrough Communicating the insights have to be more than merely pushing out information. Using infectious passion and energy to narrate the story will help to convey business outcomes and actions with necessary speed and impact.

IMPORTANCE OF DATA STORYTELLING

Storytelling has been a valuable tool that helped drive social cohesion for millennia, and this is permeating the seemingly abstract world of complex numbers and statistics as well. With storytelling, stakeholders can more easily process complex business information that their data presents. Additionally, stories enhance memory, making it easier for the stakeholders to retain information. Stories are also known to induce the release of hormones oxytocin and cortisol – helping create a long-lasting impact on the audience. Useful data visualization aids in human cognition of abstract data points by emphasizing analytical reasoning and using an interactive visual interface.

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Data storytelling is becoming a critical skill within the analytics industry-reflected in the rising demand for professionals with data storytelling skills. By infusing data points with strategic creativity, makes the information compelling, digestible and impactful. Data storytelling results in improved insights that are not apparent with merely using descriptive and statistical methods, resulting in faster decision making. Maneuvering the data visualization principles thoughtfully is a significant component of gripping data storytelling. It is primarily about using the principles of storytelling, such as characters, conflicts and resolutions, and applying them to the seemingly abstruse world of data analytics and statistics. The reason it has become so important, is because organizations are now stressing on deploying data-backed decision making from top to bottom. However, many users may not be very well aware of the complex analysis techniques or that the analysis may fail to generate enough confidence. Data storytelling is primarily about using the principles of storytelling, such as characters, conflicts and resolutions, and applying them to the seemingly abstruse world of data analytics and statistics. The reason it has become so important, is because organizations are now stressing on deploying data-backed decision making from top to bottom. However, many users may not be very well aware of the complex analysis techniques or that the analysis may fail to generate enough confidence.

During this presentation, an effort has been done to study the indispensable connection between the art of communiqué and data science technical skills and to understand that in today's digital corporate era data scientists and their knowledge are imperative for contemplation and resolution of the digital data analysis and information for business growth, cost and risk reduction and even new business model creation.

As Anne Lindbergh shares,

"Good communication is just as stimulating as black coffee and just as hard to sleep after"

By helping communicate powerful insights, data storytelling helps business capitalize on market opportunities – fast and help them remain ahead of the curve.

E. References

- 1. https://advance.biz-tech-insights.com/whitepaper/IBM-WW-Hybrid-Cloud-Enterprise-Data-Science-Waterfall-Cash-3-land.html
- 2. https://www.linkedin.com/pulse/data-science-tale-21st-centurygoose-lays-golden-eggs-aga-wolska/
- https://analyticsindiamag.com/how-to-use-effective-datastorytelling-for-business-impact/
- 4. https://www.cute766.info/how-to-use-business-storytelling-toimprove-effectiveness/
- 5. https://www.cute766.info/how-to-use-business-storytelling-toimprove-effectiveness/
- 6. https://eq.karerbuh.ru/462
- 7. http://shwevideos.comunicació21.cat/d813a9/the-importance-ofdata-storytelling-in-the-next-decade-of-data
- 8. https://zb.lusiena.ru/24
- 9. https://wl.fotoslov.ru/366
- 10. https://www.coursehero.com/file/53074326/9-Selling-predictiveanalyticsppt/
- 11. https://www.3ai.in/business-impact-creation-through-data-sciencesan-approach/
- 12. https://www.coursehero.com/file/92013377/Creating-visuals-mayseem-like-a-simple-process-but-without-having-a-story-todocx/
- 13. https://docplayer.net/185779805-Five-ways-artificial-intelligenceand-machine-learning-deliver-business-impacts.html
- 14. https://dzone.com/articles/the-art-of-story-telling-in-data-scienceand-how-t
- 15. https://in.pinterest.com/pin/702209766872401870/
- 16. https://www.analyticsvidhya.com/blog/2020/05/art-storytellinganalytics-data-science/
- 17. http://www.staging.freedomcareny.com/cgi-bin/open.php?article= the+art+of+storytelling+by+richard+steele+pdf&code=4bd90ad5b78 d059c1af054c9eae4dbab

Family Dynamics, Forgiveness and Post-Traumatic Growth of Abused Women: Basis for Positive Empowerment Psychotherapy for Abused Women (PEPAW)

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INTRODUCTION

Women abuse is no longer a new phenomenon, nor its consequences to the psychological health of a woman. It is a growing universal concern in almost all societies. The abuse suffered by women regardless of their background saturates diverse sectors (Amault, 2014) and is mostly termed as violence against women, which encompasses many forms of violence. This results in physical, sexual, psychological harm or any suffering experienced by women. These acts of suffering include threats of abusive acts in any form, coercion, or random public or private deprivation of liberty.

This growing concern was also tackled by the World Health Organization (2013) as they revealed that 35 percent of women have experienced either physical and/or sexual abuse in a study based on existing data from over 80 countries. With the unnerving statistics on crimes committed against women, the Philippines is no exception to this perennial problem.

In the article on Statistics on Violence against Filipino Women, the Philippine Commission of Women (2014) cited the report prepared by the Philippine National Police (PNP) stating an estimated increase from 6,271 in 2004 to 23,865 filed cases of maltreated and abused women under Women and Children Protection Center (WCPC) in 2013. Family Dynamics, Forgiveness and Post-Traumatic Growth of Abused... 63

In the light of the well-documented bothersome psychological impacts of abuse, different studies support the possibility of personal growth among these abused women. Abulon (2014); Jirek (2011); and Anderson, Danis, & Havig (2011) cited survivors of sexual assault, incest and sexual abuse, intimate partner violence, parental domestic violence, and child abuse who have positively demonstrated personal growth, strength, compassion, and wisdom from the depths of their suffering from the traumatic abuse.

Hence, it is important to determine the factors supporting the recovery to assure that no woman is left psychologically bruised. Different researches gave highlight to family dynamics (Compton and Hoffman, 2013; Gonzales, 2010; Krenkel, Espinosa, Moré & Motta, 2016; Smith and Segal, 2016), forgiveness (Amja and, Bokharey, 2014; Cavin and Dohen, 2014; Heintzelman, Murdock, Krycak, and Seay, 2014; Quenstedt-Moe and Popkess, 2014; Tsang and Stanford, 2012) and post-traumatic growth (Avital and Bilha, 2016; Tedeschi & Calhoun in Heintzelman, Murdock, Krycak, and Seay, 2014; Jirek, 2011; Anderson, Danis, and Havig, 2011; Schultz, Tallman and Altmaier, 2010) as contributing factors in the healing and recovery of abused women. The same variables were used to explore the needed psychotherapy approach to allow healing to the abused women in the study.

In the review of research, the American Psychological Association suggests making healthy connections with family, friends, and community to maintain positivity amidst life adversaries. As such, there are different studies that presume that experiences of abuse could be influenced by the dynamics intertwined in the family system leading to the continued difficulties experienced on daily basis (Nambi, 2011; Sharma, 2015; Semahegn and Mengistie, 2015; Carandang and Sison in Abulon, 2014). Thus, in this study, healthy family dynamics are assumed to bring solid support to the recovery of an abused individual.

Meanwhile, psychologists around the world are now giving great interest in the area of forgiveness as a conscious decision to release feelings of resentment or vengeance toward a person or group who caused harm. Forgiveness is a process that consists of several stages is seen as a tool for intervention to help the abused heal. The process used the experience that aimed to transform the abused woman to let go of anger and ultimately be equipped to think more positively of the offender (Amjad and Bokharey, 2014).

Correspondingly, the concept of post-traumatic growth is accepted to bring positive psychological change because of the battle with greatly difficult life circumstances. Posttraumatic growth may allude to both the procedure and result of positive change following a horrible life ordeal (Tedeschi &Calhoun, 2010).

Moreover, given the known prevalence of mental health problems as one of the devastating negative effects and the immense chance for recovery among abused women, the value of effective treatment in facilitating healing and recovery must be given full consideration through the development of a psychotherapy approach named Positive Empowerment Psychotherapy for Abused Women (PEPAW). This is aimed to be fitted for the needs of the abused women to fully recover without negative manifestations from the painful incidents with the basis of the explored constructs of family dynamics, forgiveness level, and post-traumatic growth. Responses pertaining to the circumstances regarding the nature of abuse the women experienced were analyzed. It also uncovered the emotions, the effects, and the coping mechanisms used by the women to provide an in-depth understanding of the women that need to be assisted.

As one with the mental health professionals and as a future psychologist, the devastating statistics of women experiencing such raises the question of whether the life outcomes of abused women would run smoothly without traces of psychological bruises after the trauma brought by the abuse. Thus, it is hoped by the researcher that this study could assist in the advocacy of all concerned, especially the helping professionals that even with the existence of this traumatic event, no woman is left psychologically bruised.

OBJECTIVES OF THE STUDY

The thrust of the study is aimed to conduct a preliminary exploration of variables deemed to be related to the recovery from trauma among a sample of women who experienced psychological or emotional, sexual, and physical abuse.

Specifically, it determined the family dynamics, forgiveness level, post-traumatic growth degree, as well as the subjective emotions and experiences of the women who went through the abuse. It also digs through the effects of the abuse, the coping behaviors utilized by the participants, and their view of life after the abuse. Correspondingly, it formulated psychotherapy called Positive Empowerment Psychotherapy for Abused Women (PEPAW) intended to help understand the abused women that lead to their full healing and recovery.

METHODS

Research Design

The study utilized the concurrent mixed-method design to determine the family dynamics, forgiveness level, and post-traumatic growth of abused women.

Participants

The participants in this study were one hundred twenty-six (126) Filipino women between eighteen (18) to fifty-two (52) years of age who have experienced emotional, physical, and/or sexual abuse.

Measures

To assess the nature and deepen the understanding of the participants' experiences, family dynamics, forgiveness level, and post-traumatic growth of the participants, several instruments downloaded from different sources in the World Wide Web were used such as The McMaster Family Assessment Device (FAD), the Rye Forgiveness Scale and the Post-Traumatic Growth Inventory. It also utilized an open-ended interview guide to analyzing the subjective experiences of the participants.

Result and Discussion

Table 1 Nature	of Abuse ex	perienced by	Women	(n = 15)	1
				/	

Nature of Abuse	%	rank
Sexual Abuse	38.10	1
Psychological Abuse	34.10	2
Physical Abuse	27.80	3
Total	100	

Thirty-eight point ten percent of the participants experienced sexual abuse while 34.10% experienced abuse pertaining to the psychological category. Whereas, last among the abuse experienced is done physically by the perpetrators with 27.80%.



Figure 1 shows the nature of abuses based on the experience of the abused women. The abused women experienced different forms of abuse such as sexual, physical, and psychological. The women who went through sexual abuse experienced being exposed to pornographic materials, fondling of their private parts, incest, and marital rape. Whereas the women abused psychologically experienced the emotional turmoil brought by infidelity, ridicule, accusation, and humiliation. On the other side, physically abused women experienced the pain of domestic and non-relative violence.



Exploring women's subjective emotions revealed that most women keep negative emotions towards their abusers. They feel fear, hatred, and vengeance towards the people who abused them. However, the presence of positive emotion is also present as some women find gratitude towards their abusers despite the pain brought to them.

Negative effects of the abuse were also visible in the narratives of the participants. They have damaged self-concept characterized by poor self-concept and low self-esteem. This also displays mental health threats to the women as they are prone to depression, as well as physical and sexual aggression.

Hence, abused women proved that they are resourceful in staying strong amidst the abuse through the use of different coping behaviors such as maximizing their faith in God, utilizing their social support, using self-protective measures, seeking counseling and psychotherapy, and even with the use of negative coping mechanisms like denial and repression.

Despite the participants' abusive experiences, most of them still have a positive outlook in life and are leading to great anticipation that they will still claim success in the future. The participants' firm attitudes toward life difficulties and their positive outlook in life play vital roles in surpassing the abuse they experienced. With these, the participants have developed a positive outlook in life and have fostered constructive ways of dealing with life and others.

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Indicators	Weighted Mean	Verbal Interpretation	Rank
Planning family activities is difficult because we misunderstand each other.	2.83	Agree	1
Individuals are accepted for what they are.	2.75	Agree	2
We cannot talk to each other about the sadness we feel.	2.67	Agree	3
We avoid discussing our fears and concerns.	2.59	Agree	4
Making decisions is a problem for our family.	2.56	Agree	5.5
There are lots of bad feelings in the family.	2.56	Agree	5.5
We are able to make decisions about how to solve problems.	2.32	Disagree	7
We can express feelings to each other.	2.31	Disagree	8
We confide in each other.	2.28	Disagree	9.5
We don't get along well together.	2.28	Disagree	9.5
We don't feel accepted for what we are.	2.19	Disagree	11
In times of crisis we can turn to each other for support.	2.17	Disagree	12
Composite Mean	2.46	Disagree	

Table 2 Family Dynamics of the Respondents (n=126)

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Presented in Table 2 is the abused women's family dynamics with an overall disagreeing verbal interpretation in a composite mean of 2.46. It features the general functioning subscale under the Family Assessment Device (FAD) to describe the dynamics of the family they belong to. Thus, according to FAD, the score indicates that the family where the abused women belong functions in an unhealthy manner.


Figure 3 depicts the negative family dynamics experienced by the abused women who participated in the interview. The responses of the abused women provided a picture of a dysfunctional family system with themes showing Broken Family and Disengaged Family. It displays the negative descriptions from the participants' experiences that contribute to the portrayal of a poor family relationship.

Table 3 Respondents' Likeliness to Forgive (n = 126)

Forgiveness Subscale	Weighted Mean	SD	Verbal Interpre- tation
Absence of Negative Subscale	3.77		Agree
Presence of Positive Subscale	2.19		Disagree
Composite Mean	2.98		Neutral

Legend: 4.50 – 5.00 = Strongly Agree; 3.50 – 4.49 = Agree; 2.50 – 3.49 = Neutral; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Table 2 shows the extent to which the abused women had forgiven their offenders that provided a weighted mean of 2.98 verbally interpreted as neutral. This means that although the respondents have successfully overcome their negative feelings towards their abusers such as revenge and anger, they still cannot respond positively towards them.



Figure 4 further explains how the abused women used forgiveness as a defense mechanism with a subtheme "Motivated Forgetting", how it is used based on human moral with subthemes "positive outlook" and "empathic emotion", and how family orientation influence it with subthemes, "restoration of family relationships" and "keeping the family together". The diversity of themes on the concept of forgiveness as a substantial factor in the recovery of women's abuse could be related to the quantitative result in the respondents' likeliness to forgive that post a neutral response.

Indicators	Weighted Mean	Verbal Interpretation	Rank
Factor IV: Spiritual Change	4.10	TGD	1
Factor V: Appreciation of Life	3.75	TGD	2
Factor II: New Possibilities	3.68	TGD	3
Factor III: Personal Strength	3.65	TGD	4
Factor I: Relating to Others	3.27	TMD	5
Composite Mean	3.69	TGD	

Table 4 Mean Distribution of Post Traumatic Growth (n=126)

Legend: 4.50 – 5.00 = To a Very Great Degree (TVGD); 3.50 – 4.49 = To a Great Degree (TGD); 2.50 – 3.49 = To a Moderate Degree (TMD); 1.50 – 2.49 = To a Small Degree (TSD); 1.00 – 1.49 = To a Very Small Degree (TVSD); 0 = Do not Experience (DE)

Table 4 reveals the posttraumatic growth or the degree of positive change experienced by the respondents as a result of the abuse they experienced. As many studies have shown that after the experience of traumatic events, most individuals report positive life changes, so as the result of the current study that provided a composite mean of 3.69, which indicates that the abused women experienced a positive change to a great degree. True enough, posttraumatic growth may follow the experience of being significantly hurt by another person.

Table 5 Significant Relationships on the Family Dynamics, Levelof Forgiveness and Post-Traumatic Growth of the Respondents

Variables	r-value	Interpretation
Family Dynamics and Post-Traumatic Growth	0.91	Significant
Family Dynamics and Level of Forgiveness	1.00	Significant
Level of Forgiveness and Post-Traumatic	1.00	Significant
Growth		_

*significant at 0.05

Table 5 reveals the significant relationships among the three constructs in the study. It can be clearly gleaned that the family dynamics and post-traumatic growth, family dynamics and the level of forgiveness and level of forgiveness and the post-traumatic growth of the respondents are all significantly related at R-values of 0.91, 1.00, and 1.00, respectively.

This overall picture brings the researcher to the creation of a therapy crafted according to the needs of the abused women featured in the study, thus the Positive Empowerment Psychotherapy for Abused Women (PEPAW) is recommended to be utilized by helping professionals working for the betterment of the abused women.

Overview of the Psychotherapy:	View of Human Nature
The Positive Empowerment Psy- chotherapy for Abused Women (PEPAW) is an eclectic approach to assist women who experienced different kinds of abuse such as psychological, physical, and sexual to heal and completely attain the state of recovery. PEPAW sees women as individuals with a strong sense of personality that enables them to positively see the brighter side of life amidst a darkened journey. However, to be able to attain a strong sense of pos- itivity, they need to be empowered with a solid foundation that serves as support.	Abuse Women are innately opti- mistic. PEPAW holds the deep the conviction that abused women like other human beings are essentially optimistic in nature. As human be- ings, abused women are equipped with constructive mechanisms to move forward to successfully meet the obstacles that are blocking their growth. They have the com- petence to surpass any challenges that life brings, yet at periods that human beings lose their sense of direction, an expert in the field may act as their instrument in finding their way to healing and growth. Abused Women are Family-bound- ed. Like all human beings, abused women are born into families. Hu- man life is attached to one form of family or another. The family is their greatest foundation of indi- viduality. The family serves as the ultimate support system for an in- dividual to

POSITIVE EMPOWERMENT PSYCHOTHERAPY FOR ABUSED WOMEN (PEPAW)

	assure success in life. Thus, at times of happiness and crises, it is the family that humans seek to be with for support and survival.
	Abused Women seek God for heal- ing . Abused women naturally seek the comforting embrace of God as their healers. Amidst the troubling fact that not all are blessed with a healthy family system to serve as a solid foundation for their recovery, they use the infinite power of God to survive the negative aftermath of the abuse.
Goals of Psychotherapy:	Development of Maladaptive Be- havior
The basic goal of PEPAW is to equip abused women who suffered from any form of abuse to master growth despite the adversity experienced.	The main sources of the maladap- tive behavior to abused women are the abuse itself that they experi- ence, their inability to forgive, the unhealthy family system, and; lack of spirituality.

Techniques of Psychotherapy:

Approach 1: Digging-through. In this phase, the abused woman describes the presenting problem the way she sees it. Empathic listening and confidence that this is part of the healing process is very important in this phase.

Approach 2: Finding the Backbone. This technique requires the presence of significant others like family members to serve as a strong support system for the abused. The abused woman determines the level of family functioning, if the client belongs to a healthy or unhealthy family, by identifying the relationship of the abused to the members of the family. This will provide information on how the family would resolve family issues, specifically the reality of having one family member as a victim of an abuse, thus emphasizing open communication to find ways to help the abused member from recovering from the negative experience. The presence of the family in resolution of the problem creates a healthy environment that makes each member realize the importance of having healthy family dynamics in the recovery.

Approach 3: Mastery of Forgiveness. This technique provides processing of forgiveness to be equipped with the ability to forgive and avoid the ever-increasing cycles of hostility and desire for revenge.

Approach 4: G-Technique. In this phase, the therapist focuses on empowering the client to achieve growth amidst the abuse through the assistance of God. The client's strong and growing relationship with God will certainly assist them in forming a firm attitude toward life difficulties and achieving their positive outlook in life play to surpass the abuse they experienced. Through God, the clients will develop a positive outlook in life and will gain empowerment to find constructive ways in dealing with life and others

Conclusion

Based from the results and findings reflected in the study, the following conclusions were drawn:

- The abused women belong to a family that functions in an unhealthy manner. They have a high level of misunderstandings, negative emotions towards each other, lack good communication and support needed in times of crisis.
- 2. The abused women are neutral in forgiving their offenders. They have overcome their negative feelings towards their abusers and they still cannot respond positively towards them.
- 3. The post-traumatic growth of the abused women is of high level. They were able to rise from the pain of the abuse that they have experienced through a great degree of spiritual change, appreciation of life, new possibilities, personal strength and relationship to others.
- 4. There are significant relationships among the three constructs in the study. It can be clearly gleaned that the family dynamics and post-traumatic growth, family dynamics and the level of forgiveness and level of forgiveness and the post-traumatic growth of the respondents.
- 5. The different abuses they have experienced brought women into positive and negative emotions toward their abusers, provided negative effects such as damaged self-concept and mental health issues, made them utilize different coping

behaviors and led them to still view life in an affirmative manner.

 A Positive Empowerment Psychotherapy for Abused Women (PEPAW) is developed to assist in the recovery and healing of women who have experienced being abused psychologically, physically or/and sexually.

Recommendation

Taking into considerations the mentioned conclusions, the researcher proposed the following recommendations for the benefit of the abused women:

- The family should provide an affectionate relationship and maintain good communication among and between family members to serve as a strong foundation of a woman's individuality, a support system, and aid in the progress of forgiving and recovery of the abused women.
- 2. There must be an enhancement of public awareness and consciousness to intensify the advocacy and education on the issue of women abuse as a long-term solution. This can be done by tapping different organizations and institutions such as the religious sectors and the academe to integrate values and practices related to women abuse prevention in their programs.
- 3. There must be an establishment of community-based counseling services for victims of women abuse through the assistance of the Gender Development Program and Department of Social Welfare and Development. Thus, the Government must provide a budget for programs that empower and heal abused women.
- The Positive Empowerment Psychotherapy for Abused Women (PEPAW) may be used by practitioners in the field to assist in the recovery and healing of women who have experienced being abused psychologically, physically or/and sexually.
- 5. Future researchers may work on the nature of abuse separately to thoroughly study the specific needs of women who experienced such kind of abuse.

References

- 1. Abulon, E. (2014). Breaking through the Bondage of Abuse: Case studies of six Filipino battered women. *Philippines: Philippine Normal University*
- Amjad, F. and Bokharey, I. (2014). Comparison of Spiritual Well-Being and Coping Strategies of Patients with Generalized Anxiety Disorder and with Minor General Medical Conditions.
- 3. Amault, D. (2014). Healing from Domestic Violence and Trauma. Retrieved from http://www.safeireland.ie/wp-content/uploads/Safe-Ireland-Healing-from-DV-Trauma-FULL-REPORT-.pdf
- Anderson, A., Webb, M., Mvududu, N., Charbonneau, A. (2015) Dispositional Forgiveness and Meaning Making: The Relative Contributions of Forgiveness and Adult Attachment Style to Struggling or Enduring With God. Journal of Spirituality in Mental Health. *Retrieved from http://dx.doi.org/10.1080/19349637.2015.985557*
- Anderson, M., Danis, S., & Havig, K. (2011). Adult Daughters Of Battered Women: Recovery And Posttraumatic Growth Following Childhood Adversity. *Families in Society*
- Avital, T. and Bilha D. (2016). Posttraumatic Growth among Women Survivors Of Childhood Sexual Abuse: Its Relation To Cognitive Strategies, Posttraumatic Symptoms and Resilience. Psychological Trauma: Theory, Research, Practice, and Policy, 8(5): 550-558, http:// dx.doi.org/10.1037/tra0000103.
- 7. Cavin, G. L. & Dohen, R. D. (2012). The Effects of Forgiveness Therapy on Post-Traumatic Stress among Abused Women. *Journal of Consulting and Clinical Psychology*
- 8. Compton, W. C., & Hoffman, E. (2013). Positive Psychology: The Science of Happiness and Flourishing (2nd ed.). Belmont, CA: Wadsworth.
- 9. Gonzalez, J. (2010). The Battered Woman Experience: A Phenomenological Study Exploring the Lives Of Latina Women And Their Experience With Domestic Violence. *University of Nebraska*
- Heintzelman, A., Murdock, N. L., Krycak, R. C., & Seay, L. (2014). Recovery from infidelity: Differentiation of self, trauma, forgiveness, and posttraumatic growth among couples in continuing relationships. *Couple and Family Psychology: Research and Practice, 3*(1), 13–29. https://doi.org/10.1037/cfp0000016
- 11. Jirek, S. (2011) Posttraumatic Growth in the Lives of Young Adult Trauma Survivors: Relationships with Cumulative Adversity. *University* of Michigan

- Krenkel, S., Espinosa, L., Moré, C. & Motta, C. (2016). Resonances arising from Sheltering in the Family Dynamics of Brazilian Women in Situations of Violence. Universitas Psychologica 14(4), DOI: 10.11144/ Javeriana.upsy14-4.rdad
- 13. Nambi S. (2011). Indian Perspective. Psychosocial and Legal Aspects of Domestic Violence. *India: Indian Psychiatry Journal*
- 14. Philippine Statistics Authority (PSA) [Philippines], and ICF International. 2014.
- 15. Philippines National Demographic and Health Survey 2013. Manila, Philippines, and Rockville, Maryland, USA: PSA and ICF International
- 16. Quenstedt-Moe (). Using Forgiveness as an Intervention for Healing in Women Who Experience Abuse. *Missouri Western State University, USA*
- Schultz, J. Tallman, B. Altmaier, E. (2010). Pathways to Posttraumatic Growth: The Contributions of Forgiveness and Importance Of Religion And Spirituality. Psychology of Religion and Spirituality. Retrieved from http://dx.doi.org/10.1037/a0018454
- Segal, J. and Smith, M. (2016). Help for Abused and Battered Women. Retrieved from https://www.helpguide.org/articles/abuse/help-forabused-and-battered-women.htm?pdf=true
- 19. Semahegn A. and Mengistie B. (2015) Domestic Violence against Women and Associated Factors in Ethiopia; Systematic Review
- 20. Sharma, I. (2015) Violence against women: Where are the solutions?
- 21. Statistics on Violence against Filipino Women (2014) Retrieved from http://www.pcw.gov.ph/statistics/201405
- Tsang, J. and Matthew S.() Forgiveness for Intimate Partner Violence: The Influence of Victim and Offender Variables Stanford, Department of Psychology and Neuroscience, Baylor University; retrieved from http://www.baylor.edu/content/services/document.php/35618.pd
- WHO (2013). Global and regional estimates of violence against women. *Retrieved from* http://apps.who.int/iris/ bitstream/10665/85239/1/9789241564625_eng.pdf

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Research on Activated Carbon and Thin Films: Synthesis and Applications

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Abstract

Nano material is an important field in world of science and technology. In this work, activated carbon and metal chalcogenide thin films were discussed. Activated carbon has high surface area and porosity structure. Basically, it could be synthesized by using various raw materials under carbonization and chemical activation process. Utilization of activator such as potassium hydroxide, sodium hydroxide, zinc chloride, phosphoric acid, sulphuric acid could improve texture properties and adsorption capacity. On the other hand, metal chalcogenide thin films have been prepared by using various deposition techniques including physical and chemical method. These materials have areat potential in solar cell, sensor device, laser device and optoelectronic applications. Characterization of metal sulfide, metal selenide and metal telluride thin films was studied by using different tools. X-ray diffraction, atomic force microscopy, scanning electron microscopy, energy dispersive x-ray analysis and UV-Visible spectrophotometer were used to study the structure, morphology, composition and optical properties of samples.

Keywords: Activated Carbon, Activation, Metal Chalcogenide, Thin Films, Deposition Technique

INTRODUCTION

Currently, there are several types of nano materials have been investigated. These materials are produced at very small scale, in the range from 1-100 nm. They show unique properties including electronic, optical and mechanical behaviors based on the results obtained from various characterization tools. Therefore, these materials could be used in various applications such as medical, environmental, solar cell, optoelectronic, sensor and laser devices. Activated carbon could be used as cheap adsorbent [Ramonna et al., 2019] to remove heavy metal, dye, pollutants from wastewater. There are many researchers investigate texture characteristics [Habila et al., 2019] of activated carbon including surface area, microspore diameter distribution and total pore volume. Preparation of activated carbon from different raw materials including agricultural wastes, waste materials [Joana et al., 2007], food wastes and agricultural by-products because of affordability, local availability [Jaria et al., 2019] and efficiency in removing many pollutants [Gamzenur et al., 2019]. Chalcogenide metal thin films received great attention due to several unique properties [Ho, 2016; Deepank et al., 2019; Ho et al., 2018]. Chemical bath deposition, spray pyrolysis [Deshmukh et al., 2012], electro deposition, pulsed laser deposition, thermal evaporation, vacuum evaporation, magnetron sputtering [Hakan et a., 2017], molecular beam epitaxy, metal organic chemical vapour deposition [Joseph et al., 2019], plasma enhanced chemical vapour deposition, sol gel, spin coating, successive ion layer adsorption and reaction method have been reported by many scientists in order to produce different nanostructured thin films [Ho, 2017; Daniel et al., 2019; Ho et al., 2019].

In this book chapter, preparation of activated carbon and metal chalcogenide thin films have been discussed. Properties and applications of these nanostructured materials have been reported.

LITERATURE REVIEW

Activated Carbon

Surface area and pore characteristics of activated carbon prepared by using various raw materials as indicated in Table 1. Activated carbon has high surface area and high micro porosity structure. It could be produced from various precursors such as agricultural wastes. Activated carbon was synthesized under carbonization and activation process. The activation process could be grouped into physical and chemical activation. Carbon dioxide or water stream was used in physical activation. Meanwhile, several types of activator such as zinc chloride, phosphoric acid, sodium hydroxide and potassium hydroxide were employed during chemical activation. These activators are considered as cheaper and less corrosion. The obtained carbons could be employed for wastewater treatment since few decades ago. Typically, it could be utilized in different forms such as power, granular and impregnated type. Nowadays, "dye wastewater" produced through human activities and various industries. It must be treated with activated carbon to avoid allergic dermatitis and inhibit sun light penetration in the water. Up-to-date, wastewater treatment in the dye industry could be carried out by using various methods. Generally, food industry, textile industry, paper industry and leather industry contributed to the dye production. Adsorption, solvent extraction, and ion exchange technique were used to remove dye from wastewater. The advantage of each technique was highlighted in Table 2.

Precursor(s)	Surface Area (m ² /g)	Porosity Struc- ture	References
Wheat bran	Surface area was 2543 m2/g	Activated carbon prepared at 700 C° showed more mi- cropores. Activated carbon prepared at 900 C° more mesoporous.	Ying et al., 2019

Table 1 Surface area and pore characteristics of activatedcarbon prepared by using various raw materials.

Kanlow Switch- grass, Public Mis- canthus bio- mass	Surface area values are 783 (Public Miscanthus biomass) and 519 (Kanlow Switch- grass) m²/g.	Public Miscanthus biomass: Microp- ore volume=0.24 cm ³ /g, mesopore volume =0.17 cm ³ /g. Kanlow Switch- grass: Micropore volume=0.18 cm ³ /g, mesopore volume =0.07 cm ³ /g.	Oginni et al., 2019
Popcorn	Surface area: 2997 to 3074 m ² /g	Micropore and mesopore were produced in chemi- cal activation in the presence of sodium hydroxide. Total pore volume:	Yun et al., 2019
		1.54 to 2.42 cm ³ .g ⁻¹	
Corn cob	Surface area was found in the range of 553 to 1270 for the sample prepared under zinc chloride as activator.	Total pore volume: 0.29 to 0.67. Micropore volume: 0.045 to 0.28.	Duan et al., 2019
Mangosteen peel	Surface area is 1621 for the sample prepared 600 °C, 30 minutes, 1:4 im- pregnation ratio (ZnCl ₂ solution).	Total pore volume was 1.8 cm ³ /g for the sample pre- pared at optimized conditions.	Asma et al., 2019

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Peach, coconut, apricot	Coconut: 1101 Apricot: 819 Peach: 793	Coconut: micropo- re volume is 0.24. Apricot: micropore volume is 0.184. Peach: micropore volume is 0.206.	Qu et al., 2019
Tabah bamboo	Surface area was increased from 50.45, 108.5 to 210 m²/g with in- creasing the activation time (50, 100 and 150 min- utes)	Total pore volume increases (0.059, 0.089 and 0.09) as the activation time was increased.	Negara et al., 2019
Palimera sprout	Surface area was 2090 m²/g in the presence of KOH	Total pore volume is 1.44 cm ³ /g.	Sai et al., 2019
Slash pine wood	979 – 1185 m²/g under various conditions.	0.32 to 0.37 at dif- ferent experimen- tal conditions.	Ahmed et al., 2019
Jute fiber	2682, 1909 and 2494 m ² /g for the samples produced from bot- tom, middle and top part.	The activated carbon produced using bottom part indicated the highest portion of micropores if compared to other parts.	Junayet et al., 2019

Petroleum coke	Surface area increased from 2209 to 2799 m ² /g at lower tem- perature (100-250 °C), then reduced to 2205 m ² /g at 300 °C.	Micropore volume increased (0.96 to 1.21 cm ³ /g) with the increase of temperature (up to 250 °C).	Wang et al., 2019
Soft-drink, Co- ca-Cola	There are different surface areas when the amount of Coca-Co- la added as 3 (1140 m ² /g), 3.5 (1400 m ² /g) and 4 g (1250 m ² /g).	Total pore volume of activated carbon prepared at 150 °C is much higher (2.8 cm3/g) if compared to 100 °C (1.55 cm ³ /g) and 130 °C (1.75 cm ³ /g).	Stalin et al., 2019
Cactus, pear seed	Surface area of activated carbon prepared using cactus increased with the impregna- tion rate from 0.5 (171 m²/g), 1 (377 m²/g) and 2 (471 m²/g).	Surface area was 590, 815 and 867 m ² /g with the degree of impreg- nation rate (0.5, 1 and 2).	Mourad et al., 2019

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wood	Higher surface area (779-858 m2/g) was observed in the presence of nitric acid during the oxidation process if compared to raw activated carbon (735 m ² /g).	The samples treat- ed with nitric acid solution indicated higher percentage of mesoporous (48.9-54.7 %).	Reyers et al., 2019
Coconut shell	Surface area was 1916 m²/g	Microporous volume was 0.25 cm ³ /g.	Feng et al., 2019
Olive tree pruning	Surface area (800- 3490 m ² /g) strongly de- pended on activation conditions.	Total pore volume is in the range of 0.33 – 1.66 cm ³ /g for all the samples.	Arminda et al., 2019

Table 2 Several techniques of removing dye, heavy metal and
pollutants from wastewater.

Adsorption	Solvent Extraction	Ion Exchange
Low energy is required	Inexpensive technique	Environmental friendly technique
Low maintenance cots is needed	Repeatable and repro- ducible process [Yang et al., 2006]	Cheap maintenance
Simplicity set up, easy operation	Simple operation [An- tonio et al., 2010]	Efficient method
Simple design	Simple apparatus	Re-usable
Local availability	Sensitive	Cost effective

Wide pH range	High concentration of active sites [Sanjay and Rashmi, 2012].
High performance [Athar and Ahmed, 2019]	High trans-formation of components [In- amuddin et al., 2019]
Excellent removal of a wide variety of dyes in wastewater [Eric et al., 2012]	

Chemical activator could be used during the synthesis of activated carbon (Table 3). For example, sulphuric acid, sodium hydroxide, potassium hydroxide, phosphoric acid, zinc chloride, potassium carbonate (K₂CO₂), potassium dihydrogen phosphate (KH_PO₄), sodium hydroxide and potassium hydroxide play an important role during the chemical activation process. Generally, carbonization process was carried out, then single step chemical activation was done further. There are some advantages of chemical activation including reduce operation time, operational cost, energy consumption, and production with higher efficiency could be seen. Researcher reported that great improvement could be observed such as encourage production of crosslink, limit the production of volatile compounds, and dissolve the cellulosic component during the chemical activation and dehydrogenation capability of material. Up-to-date, the influence of impregnation ratio has been reported by many researchers. It is described as the weight of chemical activator (in grams) to the weight of dried carbon used.

Table 3 Several chemical activators have been used to prepare activated carbon.

Activator	Highlighted results	Reference
ZnCl ₂	Activated carbon was produced using pine cone.	Kose et al., 2018

	Activated carbon with 1 impregnation ratio exhibited main micro- porous structure and lower surface area (1666 m ² /g). Sample with 4 im- pregnation ratio indi- cated higher surface area (2771 m2/g), large amount of mes- oporous (1.22 cm3/g), less microporous (0.9 cm ³ /g). The obtained activat- ed carbon indicated 87 F/g specific capaci- tance.	
ZnCl ₂	Activated carbon pre- pared using Arundo donax in the presence of activator. Sample yields reduced with an increase in im- pregnation ratios from 0.5 to 3 at carboniza- tion temperature of 300 °C	Osman and Yuksel, 2018
	The best impregnation ratio was 1.5, and pro- duced the highest sur- face area (1874 m2/g).	
ZnCl ₂ , K ₂ CO ₃ , KH ₂ PO ₄	There are several chemical activators were used to produce activated carbon from tamarind seed.	Jeyashelly et al., 2018
	Activated carbon pre- pared using zinc chlo- ride has the highest percentage (39.18 %)	

	of yield if compared to KH_2PO_4 (26.8 %) and K_2CO_3 (18 %). Zinc chloride is the best activator, and often used as activating agent for green precursor. The carbon prepared using zinc chloride	
	showed the highest iodine number and po- rosity as well.	
Zinc chloride	Sunflower seed husk was used as raw mate- rial to produce activat- ed carbon. lodine number in- creased (1221 -1545 mg/g) with increasing of impregnation ratio from 0.5:1, 1:1 and 1.5:1. The best impregnation	Orhan et al., 2018
	ratio was 1:1, which produced the highest surface area (1511 m ² /g) and total pore volume (0.35 cm ³ /g).	
Phosphoric acid	The influence of phos- phoric acid concentra- tion was studied from 36 to 85 wt %.	Diez et al., 2004
	The obtained results show the best concen- tration was 36 % for the activated carbon prepared using chest- nut, cedar and walnut wood.	

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КОН	Fir wood was used to synthesize activated carbon Surface area (891- 2794 m2/g) and frac- tion of micropore vol- ume (0.76-0.82) are strongly depended on KOH/sample ratio from 0.5 to 6.	Wu et al., 2005
КОН, НЗРО4	Wood was employed as raw material The adsorption of chromium (VI) ions was higher in KOH-ac- tivated carbon if com- pared to H ₃ PO ₄ activat- ed carbon.	Khezami and Richard, 2005
НЗРО4	C. schweinfurthii nut- shell was utilized to prepare activated car- bon Large amount of car- bon (88.6 %) could be observed indicating phosphoric acid retain carbon and to prevent loss of other volatile material. Results reflected that yield increases with impregnation ratio (40-60 %), tempera- ture (200- 400 °C) and time (20 to 60 min- utes). Increased in concen- tration of activator, leads to enlarge the pores, and improve the adsorption capac- ity.	Adegboyega et al., 2015

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Sulfuric acid	Activated carbon was produced using sal wood.	John and Murthy, 2009
	The highest decolor- izing power (27 mg/g) could be observed as the impregnation ratio was 0.75.	
	Surface area increased (1012-2279 m2/g) as the impregnation ra- tio was increased from 0.25 to 0.75.	
Sulfuric acid	Orange peel was used to produce activated carbon.	Sami et al., 2018
	Carbon prepared using activator showed high- er surface area (1934 m2/g) and well-devel- oped pore.	
	Total pore volume and surface area were strongly depended on impregnation time.	
Sulfuric acid	Sunflower oil cake was employed to prepare activated carbon.	Selhan et al., 2008
	AC1, AC 2 and AC 3 represented impreg- nation ratio of 0, 0.85 ad 1.9, respectively.	
	Specific surface area, total pore volume and micropore area are found to be 8.8 m2/g, 0.0063 cm3/g and 8.26 m2/g in AC 1.	

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КОН, К2СОЗ	Soy bean oil cake was used to synthesis acti- vated carbon at 800 °C using KOH (impregna- tion ratio of 1) This raw material is considered as cheap lignocellulosic mate- rials Higher surface area could be produced by using K2CO3 (1352.9 m2/g) if compared to KOH at 800 °C. Higher ash and Sul- phur content could be observed for the sam- ple impregnated with KOH.	Karagoz et al., 2009
КОН, К2СОЗ	Grape seed was used to synthesis activated carbon by using differ- ent activators. The results are main- ly microporous, but various surface area if using 25% KOH (1222 m2/g) and 50% K2CO3 (1238 m2/g). Higher yield could be observed at 600 °C if compared to 800 °C for both activators.	Irem et al., 2014

КОН	Rice straw was used to produce activate car- bon via carbonization and activation meth- od.	Basta et al., 2009
	High methylene blue adsorption, high yield, and high surface area (1917 m2/g) could be obtained after these two steps.	
Phosphoric acid	Coconut shell was used to prepared acti- vated carbon.	Kang et al., 2010
	Sample impregnated with 0.25 M of phos- phoric acid can im- prove toluene (95.8 to 98.1 %) and isopro- panol (95.2 to 97.2 %) removal efficiency.	
	Surface area reduced from 724.9 to 240.5 m2/g as the concen- tration of phosphoric was increased (0.25 to 3M) indicating ac- tivator occupied the pores.	

NaOH Activated carbon pr duced using rice hu under various activ tion temperatures.		Khu and Thu, 2014
	FTIR spectra revealed that formed basic group such as carbonyl and quinone at higher activation tempera- ture.	
	The films prepared at 800 °C showed the highest amount of basic group, could be used in supercapacitor applications.	
	Surface area and total pore volume varies 2482-2681 m2/g and 1.2929-1.4016 cm3/g.	
NaOH	Coconut shell was used to produce ac- tivated carbon under various impregnation ratios such as 1:1, 2:1 and 3:1.	Andre et al., 2011
	Surface area (783 to 2825 m2/g) increased with increasing im- pregnation ratio.	

Metal Chalcogenide Thin Films

Thin films have received great attention due to good chemical, physical [Kassim et al., 2010], optical [Saravanan et al., 2010] and electrical properties. The obtained films have been used in

many applications such as gas sensing, solar cell [Nagalingam et al., 2010], sensor device, laser device, energy conversion, energy storage and field-effect transistors. There are many deposition techniques have been used to prepare thin films. Basically, these deposition techniques could be divided into physical or chemical method [Tan et al., 2010] as indicated in Table 4. Research findings supported that each of these techniques has benefit [Ngai et al., 2011] and limitation as well. Quality and properties of films [Rosli et al., 2010] strongly depended onto deposition method as well.

Thin films deposition methods		
Physical method	Chemical technique	
Sputtering	Chemical bath deposition method	
Thermal evaporation	Chemical vapor deposition	
Pulsed laser deposition	Atomic layer deposition	
Molecular beam epitaxy deposition	Electro deposition Spray pyrolysis	
Electron beam deposition	Sol gel process	
Vacuum evaporation	successive ionic layer adsorption and reaction	

Table 4 Methods of films deposition technique

Atomic layer deposition has been employed to produce thin films. Several advantages could be observed such as produce pin hole free morphology, synthesis films at low temperature, control film thickness easily and high aspect ratio coating. Generally, thin films are slowly formed from different precursors on substrate. Researcher explained that the first raw material is adsorbed on the surface of substrate in order to produce monolayer materials. Following that, any excess (first raw material) will be removed. The second raw material is added and reacted with first raw material to synthesis layer on the surface of substrate. Lastly, the second raw material is cleared from the reaction chamber. This procedure is repeated until get desired thickness. Table 5 showed the thin films prepared by using atomic layer deposition method.

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Thin films	Highlighted results	Reference
ZnS	Thin films grown on p-type GaSb(100) in the presence of hydrogen sulfide and dieth- ylzinc precursors.	Runshen et al., 2011
	The growth rate was 0.13 nm/cycle under the temperature 175 °C to 275 °C.	
	XPS studies revealed the obtained samples were stoichiometric ZnS.	
ZnS	Thin films have been produced using dieth- ylzinc and 1,5-pentanedithiol.	Ko et al., 2017
	The growth rate was 0.1 Åper cycle at 150 °C.	
	XPS and XRD indicated amorphous ZnS structure.	
CdS	Thin films have been synthesized onto Si (100) using dimethyl cadmium in situ generated H2S.	Bakke et al., 2010
	The growth rate reduced, and zincblende changed to wurtzite phase, when the temperature was increased (100 °C to 300 °C).	
	Band gap values wre found in the range 2.3 eV to 2.42 eV.	
PbS	Thin films were prepared at low tempera- tures (45 to 155 °C).	Georgi et al., 2020
	The obtained films showed uniform, crys- talline, p-type conductivity and good mo- bilities (10-70 cm2/V.s.	
CdZnS	Thin films have been prepared using di- ethylzinc, dimethylcadmium and hydrogen sulfide.	Jonathan et al., 2011
	The co-existence of zinc blende and wurtz- ite could be observed in TEM studies.	

Table 5 Experimental results obtained in the thin filmsprepared using atomic layer deposition technique.

CuInS2	Thin films have been deposited onto differ- ent substrates (glass, TCO glass and TiO2 substrate), pressure values (2 – 10 mbar), temperatures (350 °C to 500 °C).	Nanu 2004	et	al.,
	Several types of structures (CuInS2 single phase, Cu-poor, Cu-rich) were observed.			

Chemical bath deposition method is considered as cost-effective method [Atan et al., 2009] to produce polycrystalline films [Gwee et al., 2009] under larger scale deposition [Yazid et al., 2009]. The obtained films are quite stable, however, strongly depended on experimental conditions such as pH, concentration of solution, deposition time, complexing agent. The presence of complexing agent improves the quality of thin films [Anuar et al., 2010]. This technique has simple experimental setup. Chemical bath contains metal ion and chalcogen ion solution, pH meter and substrate. During the deposition process, substrate will be immersed into chemical bath. There are two processes could be observed in this method. Formation of films occurred by sequential ionic reactions under ion-by-ion process. Another process called cluster process, where colloidal particles are absorbed at the substrate surface to produce layer.

Copper sulphide thin films were prepared in the presence of amino acid [Daniela et al., 2019]. Morphology and structure studies showed the nanoflake particle with hexagonal structure. of complexing agent (amino acid). Thin films produced by using alanine, glycine and serine, showed thickness of 42, 55.4 and 70 nm respectively. Chemical bath deposition of lead selenide in the presence of tri-sodium citrate as described [Sharmistha et al., 2015]. Researchers explain that thickness increased in longer deposition time (5 hours), indicating complexing agent can control Pb²⁺ ions during the experiment. XRD data showed that the films synthesized for 4 and 5 hours have more diffraction peaks and higher intensities. AgAIS, films have been produced using silver nitrate, aluminium sulphate, thiourea and EDTA (complexing agent). Film thickness increased from 0.03 µm to 0.52 µm in longer deposition time [Ezeobele and Ezenwa, 2015]. The obtained band gap values are in the range of 2.15 to 2.4 eV. Research on Activated Carbon and Thin Films: Synthesis and Applications 95

Preparation of tin sulphide thin films by using stannous chloride, thioacetimide and tartaric acid. Formation of complex ion was observed, Sn²⁺ ions combined with S²⁻ ions to form SnS films. The films prepared at 70 °C show high optical conductivity, low loss of power, absorption edge was shifted to longer wavelength [Gedi et al., 2015]. The guartz was used as substrate in order to prepare ZnS films by using NH, OH. Thickness of 200 nm have been produced, and could be used in optoelectronic applications. Energy dispersive X-ray analysis results supported that ratio 1:1.1 (Zn:S) for all samples [Taisuke and Ando, 2012]. Chemical bath deposited CdS₀₅Se₀₅ films were used in temperature sensor, holography, and optical waveguide. Visual observation indicated the yellowish orange films were synthesized onto non-conducting glass substrate. Complexing agent such as hydroxyquinoline was used to control release Cd2+ ions slowly. An increase of the crystalline size leads to decrease in the electrical resistivity [Khomane, 2013].

Cadmium selenide thin films could be used in electronic, optoelectronic and photovoltaic. Deposition was carried out onto soda lime glass in the presence of ammonia. The zinc blende structure and band gap (1.8 to 1.9 eV) were observed for all the samples prepared using cadmium chloride and sodium selenosulphate. Morphology studies indicated bigger grain could be seen when the concentration of ammonia (0.4 to 0.8 M) was increased [Yu et al., 2013]. Table 6 showed the thin films prepared by chemical bath deposition method under various substrates.

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Thin films	Highlighted results	Reference
SnS	Deposition of thin films was carried out in 180 minutes, temperature of 65 °C and var- ious pH values (pH 5.5 to 8.5). The obtained showed orthor- hombic phase, and plate-like grains with some agglomer-	Sanchez et al., 2021
	ates.	

Table Experimental results obtained in the thin films prepared using chemical bath deposition method 6

	The ion-by-ion and complex decomposition were observed at lower pH value. However, hydroxide aggregation mech- anism was detected when the pH value was increased.	
PbSe	Deposition was carried out at 80 C, pH=12.57, 15 minutes, by using Na2SeSO3 and Pb(CH- 3COO)2.3H2O.	Bandoh et al., 2021
	XRD patterns showed strong diffraction peak in (200) plane with average crystallite size was 10.3 nm.	
	Band gap values were 1.47 eV and 1.35 eV in as-deposited films and annealed films, re- spectively.	
CdS	Thin films have been deposit- ed onto glass substrate. XRD studies (crystallite size=34.06 nm) and composi- tional analysis (S/Cd ratio was 0.2) were reported.	Doroody et al., 2021
	Morphological and optical studies showed spherical crystal surface formation and 2.32 eV, respectively.	
PbS	Thin films were prepared un- der different concentration of sulfur precursor in basic solu- tion.	Madani et al., 2021
	The band gap reduced (1.5 to 1.23 eV) with increasing the grain size (15 to 37 nm).	

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PbS	Deposition of thin films onto GaAs (111) substrate in acidic conditions.	Maayan et al., 2021
	The films prepared at pH=3 in- dicated better film quality, less defect and sharp diffraction peak if compared to other pH values.	
CdxZn(1-x)S	Deposition of thin films by us- ing CdSO4, N-methyl thiourea.	Nurhafiza et al., 2021
	Band gap (2.44 to 2.95 eV), resistivity (14.2 \times 103 to 2.25 \times 103 ohm-cm) and car- rier mobility (4.31 to 9.42 cm2 (V.s)-1) were studied for the films prepared under var- ious concentration of CdSO4.	
Cd0.85Zn0.15S	Thin films have been grown onto FTO coated glass under various capping agents (mer- captoethanol, thiophenol, polyvinylpyrrolidone and thio- glycerol.	Devjyoti and Ayush, 2021
	XRD patterns confirmed that broad and narrow diffraction peaks were observed for the uncapped and capped films, respectively.	
	Cabbage like morpholo- gy (uncapped) and honey comb, spherical like structure (capped films) were detected in SEM images.	

Electrodeposition is an example of chemical deposition technique. Thin films could be synthesized by using electro deposition method at room temperature [Jelas et al., 2008]. This technique is considered as low cost [Noraini et al., 2010] and large scale deposition could be carried out. Commonly, it involves the reduction of metallic ions that are produced from the electrolyte. Complexing agent plays an important role in order to bring the reduction potentials of the individual elements closer.

Stainless steel was used as substrate to prepare cadmium selenide films by using ethylenediaminetetraacetic acid (EDTA). The obtained CdSe films show n-type conductivity [Pawar et al., 2008]. CdSe could be used in solar cell application. The obtained fill factor and power conversion efficiency were 0.31 and 0.34 %, respectively. Cadmium sulphide films were deposited onto Au (111) substrate [Sisman et al., 2007] under various pH values in the presence of EDTA. Structure studies show the formation of the cubic (pH 5) and hexagonal structure (pH 4). The growth of Sb₂Se₃ films at different deposition potentials by using citric acid [Fernandez and Merino, 2000]. Energy dispersive X-ray analysis data supported that the films prepared at -0.8 and -1 V (versus Saturated Calomel Electrode), displayed atomic composition close to 40:60.

The CulnSe₂ thin films were prepared by using sodium citrate [Chraibi et al., 2001]. When the concentration of complexing agent was increased, cathodic shifts of the selenium and copper were observed. Further, researchers explain that citrate ions do not change the indium potential but improves its crystallinity. Nanostructured AgInSe₂ thin films were deposited onto different substrates such as molybdenum/glass and ITO glass [Aouaj et al., 2015] by using potassium thiocyanate (KSCN). XRD data showed the strongest peak corresponded to (112) plane of tetragonal chalcopyrite structure. Optical properties revealed that the obtained films covered the whole visible range, and transparent in the near infrared region. The KSCN was used as complexing agent during the deposition process in order to produce CulnSe₂ thin films [Tzvetkova et al., 1997]. The electrolytic bath contains Cu⁺, In³⁺, Se⁴⁺ ions and thiocyanate ions.

Ternary compound such as Cd-Fe-S films were synthesized by using Na₂EDTA (ethylenediamine tetra acetic acid disodium) [Deshmukh et al., 2005]. Band gap value strongly depended (from 2.43 to 0.81 eV) on the content of iron from 0 to 1. Based on the experimental results, the best content was when x=0.2. Because of these films are more photosensitive than

other compositions. HgCdTe thin films were deposited onto SnO₂ coated glass substrate by using acetonitrile [Chauhan and Rajaram, 2008], CdCl, HgCl, and Te reacted with nitric acid. No deposition could be observed without complexing agent. The films prepared under complexing agent indicated the sharp peak corresponded to (111) plane. These films are polycrystalline with cubic structure. According to experimental findings, the best stoichiometry was observed when the composition, x=0.15, 0.3 and 0.6 at deposition potential of 0.65, 0.7 and 0.75 V (versus saturated calomel electrode). Nanostructured CdZnTe films were prepared using acetonitrile under different deposition potentials [Bansal and Rajaram, 2005]. Uniform morphology with grain size of 1 µm could be seen for the films prepared at deposition potential of -0.5 V. Scanning electron microscopy studies revealed that grain size reduces with increasing in deposition potential. Electrical studies indicated n-type and p-type could be observed in as-deposited film and annealed films, respectively.

Quaternary Cu_2ZnSnS_4 films were deposited onto Mo-coated soda lime glass substrates at room temperature [Jeon et al., 2011]. The films are nearly stoichiometric when 25 mL of complexing agent were used. Field emission scanning electron microscopy revealed that grain size reduces when the volume of tri-sodium citrate was increased. Experimental results obtained in the thin films prepared by using electro deposition method as highlighted in Table 7.

Thin films	Highlighted results	Reference
BiSe	Thin films have been synthesized using three electrode cell. Platinum as auxilia- ry electrode, saturated silver/silver chlo- ride electrode as reference electrode, working electrode (platinum wire and nickel electrode).	Sevinj et al., 2021
	XRD showed the rhombohedral structure.	
	EDAX studies confirmed the films con- tained 62.79% wt% Bi and 37.21 wt% Se.	

Table 7Experimental results obtained in the thin films
prepared using electro deposition method.

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ZnS	Thin films have been deposited onto glass/ fluorine doped tin oxide sub- strates, at pH 1.5, and deposition tem- perature (30 °C).	Madugu et al., 2021
	The electrolytic bath contained ZnSO4 and (NH4)2S2O3 solution.	
	The band gap reduced as the deposition temperature increased and at higher growth voltage.	
SnS	Thin films have been synthesized onto in- dium tin oxide coated glass substrate, at room temperature, by using tin chloride, and sodium thiosulphate.	Otmani et al., 2021
	Deposition was carried out in 1 hour, pH 1.8 and deposition potential of -1 V ver- sus Ag/Ag/Cl electrode.	
	As-deposited films showed orthorhom- bic phase. However, preferential growth direction has been changed in the films prepared by using triethanolamine.	
	The addition of ethylenediamine tetraacetic acid leads to reduce in grain size, and close stoichiometry with better crystallographic properties.	
C u (l n 1 - x,Gax)Se2	Thin films have been prepared under various In3+ and Ga3+ concentrations.	Ruiz et al., 2021
	Band gap values are in the range of 1 to 1.4 eV.	
	Raman spectrum revealed the films were low crystallinity, and the presence of sec- ondary compounds (selenium and Cu-Se compound).	
CZTS C u 2 Z n -	Kesterite thin films have been synthe- sized using electro deposition method.	Mkawi, 2021
SnS4	Band gap values were in the range of 1.56 eV to 1.71 eV.	
	The adsorption coefficient was observed higher than 104cm-1 in the visible region.	

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CZTS C u 2 Z n - SnS4	Thin films have been deposited onto in- dium tin oxide coated glass, pH 5, depo- sition time (2700 seconds), deposition potential (-1.05 V), complexing agent (trisodium citrate).	Demir, 2021
	The studies of the corrosion behavior in- cluding solution resistance (253.8 Ω cm2), polarization resistance (944.2 Ω cm2), constant phase element (1.547X10-3 Ω -1scm-2), constant phase element ex- ponent (0.5), and diffusion potential (8.63 X10-3 Ω -1s0.5cm-2) were reported.	

One of the modern chemical deposition methods is called successive ion layer adsorption and reaction (SILAR) method. It has many advantages [Anbazhagan et al., 2021] and can produce film thicknesses in the range of tenths of nanometers to several micrometers [Yosita et al., 2021]. Researcher concluded that SILAR deposition technique comprised of two important processes [Fowodu et al., 2021], namely adsorption of ion onto the substrate [Kola et al., 2021] and reaction of the adsorbed ion layer will be observed. During the deposition process, several processes could be observed [Bronusiene et al., 2021] such as dipping into cationic solution, rinsing in de-ionized water, dipping in an ionic solution and rinsing in de-ionized water. Table 8 showed the SILAR deposition method has been used to produce binary, ternary and quaternary thin films successfully.

Table 8 Experimental results obtained in the thin films prepared using successive ion layer adsorption and reaction method

Thin films	Highlighted results	Reference
ZnSe	The growth of films onto glass substrate, at room temperature using zinc ace- tate and sodium seleno sul- phate solution.	Kale and Lokhande, 2004
	The films are selenium de- ficient, band gap about 2.8 eV and electrical resistivity to be 107Ω cm.	

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ZnS	Zinc acetate and sodium sulphide were employed to prepare thin films. SEM and XRD confirmed uniform surface and cubic phase, respectively. The grain size increased from 15 to 49 Å with increasing the immersion cycles (50 to 150 cycles).	Ashith and Rao, 2018
CuS	Thin films have been syn- thesized onto amorphous glass substrate at room tem- perature. The film thickness influenc- es crystal structure. Band gap values are in the range of 2.22 to 1.78 eV.	Tuba, 2019
NIS	The films have been pre- pared under various sub- strates such as single crystal Si (111), glass and fluorine doped tin oxide. XRD pattern confirmed that the crystallinity depended on the nature of substrate. Thermo emf studies and band gap were observed to be p-type and 0.45 eV, re- spectively.	Lokhande and Sar- tale, 2001
CulnSe2	Thin films were synthesized under various deposition temperatures. Higher deposition tempera- ture enhanced reaction ki- netics, ionic diffusion veloc- ity, lead to fast growth rate of films.	Yang et al., 2009

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	The films prepared with 60 dip-cycles, the growth rate increased (180 nm to 1000 nm) with increasing the deposition temperature from 30 °C to 90 °C.	
CulnS2	The films were grown onto glass substrate by using CuCl2, InCl3 and Na2S solu- tions. The films showed close to the stoichiometry of CuInS2 based on XPS peaks. XRD data and UV-Visible spectra demonstrated chal- copyrites and band gap of 1.5 eV.	Wei et al., 2007
Cu2ZnSnS4	Thin films were prepared onto glass substrate by us- ing CuSO4, ZnSO4, SnCl2 and Na2S solutions. XRD patterns showed two diffraction peaks, attributed to (220) and (112) plane, in- dicating kesterite structure. Thin films have high absor- bance of light in visible re- gion, showing they are ab- sorbing materials. The absorption coefficient was larger than 104 cm-1, which could be used in solar cell application.	Henry et al., 2016

Researcher concluded that crystalline silicon [Ho et al., 2021] and metal chalcogenide thin films [Othman et al., 2021] have great potential to be used in solar cell applications. This is due to some reasons such as appropriate band gap value [Ho, 2020], high absorption coefficient [Ho and Oladijo, 2020] and good electrical properties [Ho, 2021]. Based on the literature review, several types of thin films such as cadmium telluride, copper indium gallium diselenide, amorphous thin film and CIS thin films have been employed as absorber materials in solar cell applications. Amorphous silicon has been produced by using chemical vapor deposition technique, and used in solar cell application. The benefits of amorphous silicon including non-toxic material, and operate well in low light conditions. However, amorphous silicon loses efficiency rapidly. Thin film solar cell was used to replace silicon based solar cell. The photovoltaic behavior of metal chalcogenide thin films was studied such as fill factor, and power conversion efficiency. Solar energy has many advantages including available every day, pollution-free, no greenhouse gases will be produced and less maintenance over 25 years. Table 9 showed the sulfur, selenium, and tellurium based thin films could be used in solar cell application. The design and related photovoltaic properties of solar cells were highlighted.

Thin films	Design and related photovoltaic prop- erties of solar cells	References
SnS	The p-SnS/n-Zn(O,S) junction solar cell indicated power conversion efficiency about 4.4 %	Prasert et al., 2014
Sb2S3	The films produced showed film thick- ness about 544 nm. Power conversion efficiency was 4.96%.	Zhaowen & Chen (2020).
CdS	Cadmium sulphide thin films were grown onto substrate using chemical bath deposition. The ITO/CdS/N3/Ag solar cell exhibited	Yilmaz et al.,2019
SnS	Thin films have been prepared by using thermal evaporation method. Power conversion efficient was 3.88 %.	Vera et al., 2014

Table 9 Design and related photovoltaic properties of thinfilm based solar cells
ZnS	The films were produced using SILAR deposition method, at six cycles. The ITO/AZO/ZnS/P3HT/PCBM/Ag solar cell showed power conversion efficiency of 3.25%.	Mehrabian, 2016
In2S3	Thin films (n-type In2S3) were synthe- sized via hydrothermal method.	Hsiao et al., 2013
	solar cell indicated power conversion ef- ficiency of 2.39%.	
PbS	Chemical bath deposition of lead sul- phide films was reported.	Fei et al., 2018
	The PbS/TiO2 (adding spiro-OMeTAD hole transport layer) solar cell displayed power conversion efficiency of 0.24%.	
InCdS	Power conversion efficiency was 0.4%.	Hegde et al., 2013
CuInS2	Solar cell modules (125 cm X 65 cm) were produced and indicated power conversion efficiency of 7.6 %.	Meyer et al., 2007
Cu2SnS3	Thin films have been grown at 2812 sec- onds, using radiofrequency sputtered. The power conversion efficiency of 2.39%	Mingrui et al., 2017
Cu4SnS4	The mechanochemical technique has been used to produce thin films.	
	The Mo/Cu4SnS4/In2S3/TiO2/fluorine doped tin oxide glass solar cell showed power conversion efficiency of 2.34 %.	Qinmiao et al., 2014
CuSbS2	The co-evaporation technique was used to produce thin films.	Lei et al., 2016
	The Mo/CuSbS2/CdS/ZnO/ZnO: Al/Ag solar cell exhibited power conversion efficiency of 1.9 %.	
CZTS	RF sputtering method was used to pro- duce films onto Mo-coated soda-lime glass.	Marchionna et al., 2013
	The power conversion efficiency achieved 4%.	

CuAgSnS	The power conversion efficiency of 3.99 %.	Zhao et al, 2020
GaCIGS	The influence of gallium concentration of the CIGS was investigated.	Boubakaur et al., 2020
	The Mo/Si/CIGS/ZnS/ZnO solar cell achieved 21 % (20 % gallium content and film thickness=0.75 μm)	
Sb2Se3	The electrochemical technique was used to produce thin films.	Kwon et al., 2017
	The power conversion efficiency of Mo/ Sb2Se3/CdS/ZnO/ITO solar cell was 1.8%.	
CdSe	The vacuum evaporation method was employed to synthesize thin films.	Murali et al., 2005
	Power conversion efficiency was 7%.	
ZnSe	Thin films were produced by using sol- vothermal method.	Rose et al., 2018
	Power conversion efficiency was 1.2%	
CulnSe2	Spray coating technique was employed for the production of thin films.	Vahid et al., 2010
	Power conversion efficiency of Cu- InSe2/CdS/ZnO heterojunction solar cells was 3.15%.	
MnCdSe	Thin films have been grown using elec- trochemical technique.	Shinde et al., 2014
	Power conversion efficiency was 0.71%	
C u 2 Z n - SnSe4	Thin films were synthesized via thermal co-evaporation method.	Yun et al., 2015
	The power conversion efficiency of TCO/ CdS/CZTSe/Mo solar cell was 11.6%	

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CZTSe	Sputtering deposition method was used to prepare thin films.	Rujun et al., 2018
	The power conversion efficiency was 6.78%	
CZTSSe	Two-step cadmium sulphide deposition was used to prepare thin films.	Yaowei et al., 2018
	The power conversion efficiency about 7.25% to 10.19%.	
ZnTe	Power conversion efficiency of ZnO/ CdS/ZnTe solar cell was 10%	Othmane et al., 2016
CdTe	CdTe was used as absorber material.	Zhou et al., 2005
	Power conversion efficiency was 13.9%	
Cu1.4Te	Co-evaporation method was used to produce thin films.	Guangcan et al., 2014
	Solar cell was made from glass/SnO2/ CdS/CdTe/Cu1.4Te/nickel structure. Power conversion efficiencies were in the range 7.58% to 11.75%.	
CulnTe2	Electro deposition method has been used to produce thin films.	Lakhe and Nan- du, 2014
	Power conversion efficiency was 4.13%	
CulnTe2	Power conversion of Au/CuInTe2/CdS/ ZnO/indium tin oxide solar cell was 1.22%	Peixu et al., 2019

Conclusion

Experimental results showed activated carbon could be produced by using various precursors via carbonization and activation process. The obtained activated carbon showed higher surface area and porosity structure in the presence of chemical activator. Metal chalcogenide thin films have been synthesized by using various techniques. Research findings indicated these material could be employed in solar cell, sensor, laser and optoelectronic applications.

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References

- Adegboyega, S.O., Ajayi, O.A., Michael, S.O., Mku, T.I., & Sam, S.A. (2015). Preparation of phosphoric acid activated carbons from canarium schweinfurthii nutshell and its role in methylene blue adsorption. *Journal of Chemical Engineering and Materials Science*, 6, 9-14.
- Ahmed, M.B., Johir, M.B., Zhou, J.L., Ngo, H.H., & Long, D. (2019). Activated carbon preparation from biomass feedstock: clean production and carbon dioxide adsorption. *Journal of Cleaner Production*, 225, 405-413.
- Anbazhagan, M., Siva, V., Abdul, S., & Sultan, A. (2021). Optimization of adsorption and reaction time of SILAR deposited Cu₂ZnSnS₄ thin films: Structural, optical and electrochemical performance. *Journal of Alloys* and Compounds, https://doi.org/10.1016/j.jallcom.2020.158055.
- 4. Andre, L., Alexandro, M., Eurica, M., Vitor, C (2011) NaOH activated carbon of high surface area produced from coconut shell: kinetics and equilibrium studies from the methylene blue adsorption. *The Chemical Engineering Journal*, 174, 117-125.
- Antonio, N., Borrull, F., Eva, P., & Rosa, M.M. (2010). Pressurized liquid extraction: a useful technique to extract pharmaceuticals and personal care products from sewage sludge. *TrAC Trends in Analytical Chemistry*, 29, 752-764.
- Anuar, K., Zulkefly, K., Atan, S., Tan, W.T., Ho, S.M., & Saravanan, N. (2010). Preparation and studies of chemically deposited Cu₄SnS₄ thin films in the presence of complexing agent Na₂EDTA. *Indian Journal of Engineering & Materials Sciences*, 17, 295-298.
- Aouaj, M.A., Diaz, R., Moursli, F.C.E., Silver, A.T., & Lefdil, M.A. (2015). AgInSe₂ thin films prepared by electrodeposition process. *International Journal of Materials Science and Applications*, 4, 35-38.
- Arminda, M., Maria, F., Marianela, G., & Deiana, C. (2019). Highly microporous carbons from olive tree pruning: optimization of chemical activation conditions. *Journal of Environmental Chemical Engineering*, 7, https://doi.org/10.1016/j.jece.2018.102830.
- Ashith, V., & Rao, K. (2018). Structural and Optical Properties of ZnS Thin Films by SILAR Technique obtained by acetate Precursor. *IOP Conference Series: Materials Science and Engineering*, 360, doi:10.1088/1757-899X/360/1/012058.

- Asma, N., Bahruddin, S., Bhat, A., Khan, A.S., Danish, M., Isa, M.H., & Naeem, A. (2019). Mangosteen peel waste as a sustainable precursor for high surface area mesoporous activated carbon: characterization and application for methylene blue removal. *Journal of Cleaner Production*, 211, 1190-1200.
- Atan, S., Anuar, K., Tan, W.T., Kuang, Z., Haron, M.J., Ho, S.M., & Saravanan, N. (2009). Influence of Bath Temperature and pH Value On Properties of Chemically Deposited Cu₄SnS₄ Thin Films, *Journal of the Chilean Chemical Society*, 54, 256-259.
- 12. Athar, H., & Ahmed, S. (2019). Advanced treatment techniques for industrial wastewater. Hershey: IGI Global
- 13. Bakke, R., Jung, J., Jukka, T., & Bent, S. (2010). Atomic layer deposition of CdS films. *Chemistry of Materials*, 22, 4669-4678.
- 14. Bandoh, K., Nkrumah, I., Ampong, K., & Nkum, K., (2021). Effect of annealing on the structure and optical properties of lead selenide and cadmium selenide thin film prepared by chemical bath deposition. *Chalcogenide Letters*, 18, 81-89.
- 15. Bansal, A., & Rajaram, P. (2005). Electrochemical growth of CdZnTe thin films. *Materials Letters*, 59, 3666-3671.
- Basta, A.H., Fierro, V., Celzard, A., & El, H. (2009). 2-steps KOH activation of rice straw: an efficient method for preparing high performance activated carbons. *Bioresource Technology*, 100, 3941-3847.
- Boubakeur, M., Aissat, A., Vilcot, P., & Maaref, H. (2020) Enhancement of the efficiency of ultra-thin CIGS/Si structure for solar cell applications. *Superlattices and Microstructures*, 138, https://doi.org/10.1016/j. spmi.2019.106377.
- Bronusiene, A., Popov, A., & Ancutiene, I. (2021). Effect of ascorbic acid on the properties of tin sulfide films for supercapacitor application. *Surfaces and Interfaces*, https://doi.org/10.1016/j. surfin.2021.101275.
- 19. Chauhan, S., & Rajaram, P. (2008). Electrodeposition of HgCdTe thin films. *Solar Energy Materials and Solar Cells*, 92, 550-557.
- Chraibi, F., Fahoume, M., Ennaoui, A., & Delplancke, J.L. (2001). Influence of citrate ions as complexing agent for electro deposition of CuInSe, thin films. *Physica Status Solidi A*, 186, 373-381.
- 21. Daniel, T., Nishanthi, S.T., Mohanraj, K., & Sivakumar, G. (2019). Influence of film thickness variation on the photo electro chemical cell performancesAg₂SbS₂ thin films. *Vacuum*, 161, 138-142.

110 Recent Research and Innovation: An Integrated Approach

- 22. Daniela, E.O., Arturo, I.M., & Luis, A.G. (2019). CuS films grown by a chemical bath deposition process with amino acids as complexing agents. *Materials Science in Semiconductor Processing*, 89, 18-25.
- 23. Deepank, S., Prashantkumar, G., Sipra, C., & Betty, C. (2019). Chalcogenide thin film multilayer structure for solar cell applications. *Vacuum*, 159, 141-143.
- Demir, K. (2021). The investigation of the corrosion behavior of CZTS thin films prepared via electrodeposition. *Materials Science in Semiconductor Processing*, 123, https://doi.org/10.1016/j. mssp.2020.105553.
- Deshmukh, S.K., Kokate, A.V., & Sathe, D.J. (2005). Studies on electro deposited Cd_{1-x}Fe_xS thin films. *Materials Science and Engineering B*, 122, 206-210.
- Deshmukh, P., Sharon, M., Masumdar, U., & Suryawanshi, V. (2012). Cu_{1-x}In_xSe₂ thin films: deposition by spray pyrolysis and characteristics. *Solar Energy*, 86, 1910-1919.
- Devjyoti, L., & Ayush, K. (2021). Chemical bath deposited (Cd_{0.85}-Zn_{0.15})S nanocrystalline film: Influence of capping agent on various characterizations. *Materials Chemistry and Physics*, 270, https://doi. org/10.1016/j.matchemphys.2021.124835.
- Diez, M.A., Gomez, V., Fernandez, C., Correa, E.M., & Garcia, A. (2004). Porous texture of activated carbons prepared by phosphoric acid activation of woods. *Applied Surface Science*, 238, 309-313.
- Doroody, C., Rahman, K., Rosly, H., & Isah, M. (2021). A comparative study of CdS thin films grown on ultra-thin glass substrates by RF magnetron sputtering and chemical bath deposition. *Materials Science I Semiconductor Processing*, 133, https://doi.org/10.1016/j. mssp.2021.105935.
- 30. Duan, X., Yuan, C., Jing, T., & Yuan, X. (2019). Removal of elemental mercury using large surface area micro-porous corn cob activated carbon by zinc chloride activation. *Fuel*, 239, 830-840.
- Eric, L., Jan, S., & Didier, R. (2012). Environmental chemistry for a sustainable world. Volume 2: Remediation of air and water pollution. Berlin: Springer.
- Ezeobele, E.E., & Ezenwa, I.A. (2015). Optical properties of silver aluminium sulphide ternary thin films deposited by chemical bath method. *International Journal of Science and Technology Bahir Dar-Ethiopia*, 4, 45-57.

- Fei, H., Xin, G., Zhang, Z. (2018). Low-temperature preparation of PbS thin films by chemical bath deposition and the photovoltaic performance in heterojunction solar cells. *Materials Science Forum*, 913, 792-802.
- 34. Feng, Y., Ji, W., Liu, Y., & Zheng, Q. (2019). Adsorption equilibrium of hydrogen adsorption on activated carbon, multi-walled carbon nanotubes and graphene sheets. *Cryogenics*, 101, 36-42.
- Fernandez, A.M., & Merino, M.G. (2000). Preparation and characterization of Sb₂Se₃ thin films prepared by electrodeposition for photovoltaic applications. *Thin Solid Films*, 366, 202-206.
- Fowodu, T., Adeniji, Q., & Odunaike, K. (2021). The growth and opto-electrical characterization of SILAR grown iron copper sulphide (FeCuS) ternary thin films. *International Journal of Thin Films Science and Technology*, 10, 7-11.
- Gamzenur, O., Murat, K., Esin, A., & Ayse, E.P. (2019). Chemically activated carbon production from agricultural waste of chickpea and its application for heavy metal adsorption: equilibrium, kinetic and thermodynamic studies. *Applied Water Science*, https://doi. org/10.1007/s13201-019-0942-8.
- Gedi, S., Reddy, V., Park, C., Jeon, C., & Ramakrishna, R. (2015). Comprehensive optical studies on SnS layers synthesized by chemical bath deposition. *Optical Materials*, 42, 468-475.
- 39. Georgi, P., Goran, B., Toni, M., & Heli, S. (2020) Atomic layer deposition of PbS thin films at low temperatures. *Chemistry of Materials*, 32, 8216-8228.
- Guangcan, L., Li, W., Bin, L., Zhang, J., & Wu, L. (2014). Characterization of Cu_{1.4}Te Thin Films for CdTe Solar Cells. *International Journal of Photoenergy*, https://doi.org/10.1155/2014/762576.
- Gwee, S.Y., Anuar, K., Tan, W.T., Saravanan, N., & Ho, S.M. (2009) Influence of pH values on chemical bath deposited FeS₂ thin films. *Pacific Journal of Science and Technology*, 10, 801-805.
- Habila, M.A., Ahmed, A.S., Sheikh, M., Zeid, A.A., Ahmed, A.A., Ayman, A.G., Adel, E., & Maha, I.M. (2019). Phosphonium based ionic liquid modified activated carbon from mixed recyclable waste for mercury (II) uptake. *Molecules*, 24, https://doi.org/10.3390/molecules24030570.
- 43. Hakan, Y., Suat, P., Soner, O., & Senay, V. (2017). Zn/ZnSe thin films deposition by RF magnetron sputtering. *Journal of Materials Science: Materials in Electronics*, 28, 2833-2837.

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- Hegde, S.S., Kunjomana, A.G., Prashantha, M., Kumar, C., Ramesh, K. (2013). Photovoltaic structures using thermally evaporated SnS and CdS thin films. *Thin Solid Films*, 545, 543-547
- 45. Henry, J., Sivakumar, G., & Mohanraj, K. (2016). Electrical and optical properties of CZTS thin films prepared by SILAR method. *Journal of Asian Ceramic Societies*, 4, 81-84.
- Ho, S.M., Vyas, C.U., Pratik, P., Patel, K.D., & Somnath, M. (2018). A short review of CdTe and CdSe films: growth and characterization. *Mediterranean Journal of Chemistry*, 7, 115-124.
- Ho, S.M. (2016). Optical properties of ternary thin films (Ni₃Pb₂S₂) prepared by chemical bath deposition technique. *Research Journal of Chemistry and Environment*, 20, 29-33.
- 48. Ho, S.M. (2017). Growth and characterization of CuInTe₂ thin films: review. *Journal of Engineering and Applied Sciences*, 12, 3720-3723.
- 49. Ho, S.M., Muhammad, B.T., Das, S.N., & Das, M.R. (2019). Preparation of thin films by SILAR and Spin coating method. *Eurasian Journal of Analytical Chemistry*, 14, 165-172.
- Ho, S.M., & Oladijo, P. (2020). Deposition and characterization of thin Films on Titanium Substrate: Review. *International Journal on Emerging Technologies*, 11, 299-305.
- Ho, S.M. (2020). SEM Analysis of Ni₃Pb₂S₂ thin films produced by chemical bath deposition technique in the presence of the Na₂EDTA. *EPRA International Journal of Multidisciplinary Research*. 6, 29-34.
- Ho, S.M. (2021). Deposition of Metal Sulphide Thin Films by Chemical Bath Deposition Technique: Review. International Journal of Thin Films Science and Technology. 10, 45-57.
- Ho, S.M., Ng, S.N., & Munaaim, M. (2021). Disposal Method of Crystalline Silicon Photovoltaic Panels: A Case Studies in Malaysia. *Asian Journal of Chemistry*, 33, 1215-1221. https://doi.org/10.14233/ ajchem.2021.23105.
- Hsiao, Y., Liang, W., Tang, I., Meen, T., Liu, C., Tsai, J., & Wu, T. (2013). Annealing effect and photovoltaic properties of nano-ZnS/textured p-Si heterojunction. *Nanoscale Research Letters*, 8, doi: 10.1186/1556-276X-8-470.
- 55. Inamuddin, Mohd, & Asiri, A.M. (2019). Applications of ion exchange materials in the environment. Berlin: Springer.
- 56. Irem, O., Selhan, K., Turgay, T., & Murat, E. (2014). Activated carbons from grape seeds by chemical activation with potassium carbonate and potassium hydroxide. *Applied Surface Science*, 293, 138-142.

- 57. Jaria, G., Vania, C., Carla, P.S., Maria, V., Marta, O., & Valdermar, I. (2019). Obtaining granular activated carbon from paper mill sludgea challenger for application in the removal of pharmaceuticals from wastewater. *Science of The Total Environment*, 653, 393-400.
- Jelas, H., Anuar, K., Ho, S.M., Tan, W.T., Atan, S., Zulkefly, K., & Saravanan, N. (2008). Cathodic electrodeposition of chalcogenide thin films Cu₄SnS₄ for solar cells. *Chiang Mai University Journal of Natural Sciences*, 7, 317-326.
- Jeon, M., Tanaka, Y., Shimizu, T., & Shingubara, S. (2011). Formation and characterization of single step electrodeposited Cu₂ZnSnS₄ thin films: Effect of complexing agent volume. *Energy Procedia*, 10, 255-260.
- Jeyashelly, A., Nur, A., & Satar, A. (2018). Synthesis and characterization of Tamarind seed activated carbon using different types of activated agents: a comparison study. *Materials Today: Proceedings*, 5, 17611-17617.
- 61. Joana, M.D., Maria, C.M., Manuel, F., Jose, R., & Manuel, S. (2007). Waste materials for activated carbon preparation and its use in aqueous-phase treatment: a review. *Journal of Environment Management*, 85, 833-846.
- John, U., & Murthy, Z. (2009). Removal of Pb(II) from aqueous solutions by carbons prepared from Sal wood (Shorea robusta). *European Journal of Wood and Wood Products*, DOI:10.1007/s00107-009-0315-3.
- Jonathan, R., Jukka, T., Jung, H., Bent, S., & Robert, S. (2011) Atomic layer deposition of Cd_xZn_{1-x}S films. *Journal of Materials Chemistry*, 21, 743-751.
- Joseph, O., Bolutife, O., Marcus, A., & Efe, O. (2019). Preparation and Physical Properties of Cu_xZn_{1x}S Thin Films Deposited by Metal Organic Chemical Vapour Deposition Technique. *Journal of Materials Science Research and Reviews*, 2, 1-9.
- Junayet, H.K., Freddy, M., Young, C., Lin, J., & Tofazzal, M. (2019). Jutederived microporous/mesoporous carbon with ultra-high surface area using a chemical activation process. *Microporous and Mesoporous Materials*, 274, 251-256.
- Kale, R., & Lokhande, C. (2004). Room temperature deposition of ZnSe thin films by successive ionic layer adsorption and reaction (SILAR) method. *Materials Research Bulletin*, 39, 1829-1839.

114 Recent Research and Innovation: An Integrated Approach

- 67. Kang, Y.H., Shiue, A., Hu, S.C., Huang, C.Y., & Chen, H. (2010). Using phosphoric acid impregnated activated carbon to improve the efficiency of chemical filters for the removal of airborne molecular contaminants (AMCs) in the make-up air unit (MAU) of a cleanroom. *Building and Environment*, 45, 929-935.
- Karagoz, S., Ucar, S., & Tay, T. (2009). Preparation and characterization of activated carbon from waste biomass. *Journal of Hazardous Materials*, 165, 481-485.
- 69. Kassim, A., Tan, W.T., Saravanan, N., & Ho, S.M. (2010). The effect of bath temperature on the chemical bath deposition of copper sulphide thin films. *Jordan Journal of Chemistry*, 5, 165-173.
- 70. Khezami, L., & Richard, C. (2005). Removal of chromium (VI) from aqueous solution by activated carbons: kinetic and equilibrium studies. *Journal of Hazardous Materials*, 123, 223-231.
- Khomane, A.S. (2013). Crystallographic and microscopic properties of ternary CdS_{0.5}Se_{0.5} thin films. *Optik-International Journal for Light and Electron Optics*, 124, 2432-2435.
- 72. Khu, L.V., & Thu, T. (2014) Activated carbon derived from rice husk by NaOH activation and its application in supercapacitor. *Progress in Natural Science: Materials International*, 24, 191-198.
- Ko, H., Kim, S., Jin, Z., Sun, L., & Min, S. (2017). A Novel Chemical Route to Atomic Layer Deposition of ZnS Thin Film from Diethylzinc and 1,5-Pentanedithiol. *Bulletin of the Korean Chemical Society*, 38, 696-699.
- Kola, O., Adeniji, A., Sheu, A., & Alabi, A. (2021). Effect of Different Silar Cycle on Chemically Deposited Zinc Copper Sulphide (ZnCuS). *International Journal of Thin Films Science and Technology*, 10, 117-120.
- Kose, K.O., Piskin, B., & Mehmet, K.A. (2018). Chemical and structural optimization of ZnCl₂ activated carbons via high temperature CO₂ treatment for EDLC applications. *International Journal of Hydrogen Energy*, 43, 18607-18616.
- 76. Kwon, Y., Kim, Y., Jeong, M., Do, H., & Cho, H. (2017). Crystal growth direction controlled antimony selenide thin-film absorbers produced using an electrochemical approach and intermediate thermal treatment. *Solar Energy Materials and Solar Cells*, 172, 11-17
- Lakhe, M., & Nandu, C. (2014). Characterization of electrochemically deposited CuInTe₂ thin films for solar cell applications. *Solar Energy Materials and Solar Cells*, 123, 122-129.

- Lei, W., Ma, C., Ke, H., Ru, Z., Mao, X., Pan, S., Lydia, H., Xu, J. (2016). Two-stage co-evaporated CuSbS₂ thin films for solar cells. *Journal of Alloys and Compounds*, 680, 182-190.
- Lokhande, C., & Sartale, D. (2001). Preparation and characterization of nickel sulphide thin films using successive ionic layer adsorption and reaction (SILAR) method. *Materials Chemistry and Physics*, 72, 101-104.
- Maayan, P., Yahel, E., Golan, Y., & Tzvi, T. (2021). The effect of deposition mechanism on the properties of epitaxial PbS films grown from acidic bath. *Materials Chemistry Frontiers*. https://doi.org/10.1039/D0QM01107J.
- Madani, A., Daoudi, O., Lharch, M., & Fahoume, M. (2021). Experimental and Ab Initio Investigation of the Physical Properties of PbS Thin Films Prepared by Chemical Bath Deposition (CBD). *Brazilian Journal of Physics*, 51, 1166-1174.
- Madugu, M., Lawal, A., Ndahi, M. (2021). Optical and Morphological Properties of Electrodeposited Thin Films of ZnS. *IOP Conference Series: Earth and Environmental Science*, https://doi.org/10.1088/1755-1315/730/1/012023.
- Marchionna, S., Garattini, P., Donne, A., Acciarri, M., Binetti, S., & Tombolato, S. (2013). Cu₂ZnSnS₄ solar cells grown by sulphurisation of sputtered metal precursors. *Thin Solid Films*, 542, 114-118.
- 84. Mehrabian, M. (2016). Optical and photovoltaic properties of ZnS nanocrystals fabricated on Al: ZnO films using the SILAR technique. *Journal of Optical Technology*, 83, 422-428.
- 85. Meyer, N., Meeder, A., Dieter, S. (2007). Pilot production of large-area CuInS, based solar modules. *Thin Solid Films*, 515, 5979-5984.
- Mingrui, H., Lokhande, A., Kim, Y., Ghorpade, U., Suryawanshi, M., & Kim, J.H. (2017). Fabrication of sputtered deposited Cu₂SnS₃ (CTS) thinfilm solar cell with a power conversion efficiency of 2.39 %. *Journal of Alloys and Compounds*, 701, 901-908.
- Mkawi, M. (2021) Kesterite Cu₂ZnSnS₄ thin films synthesized utilizing electrodeposition: Influence of metal doping on the properties. *International Journal of Energy Research*, 45, 1908-1917.
- Mourad, O., Lamyae, L., Safa, M., Nadia, H., & Mohamed, B. (2019). Valorisation of cellulosic waste basic cactus to prepare activated carbon. *Journal of the Saudi Society of Agricultural Sciences*, 18, 133-140.
- 89. Murali, K.R., Srinivasan, K., & Trivedi, D.C. (2005). Vacuum evaporated CdSe thin films and their characteristics. *Materials Letters*, 59, 15-18.

116 Recent Research and Innovation: An Integrated Approach

- Nagalingam, S., Kassim, A., Ho, S.M., & Abdullah, A.H. (2010). XRD, AFM and UV-Vis optical studies of PbSe thin films produced by chemical bath deposition method. *Transaction C: Chemistry and Chemical Engineering*, 17, 139-143.
- 91. Nanu, M., Meester, B., Goossens, A., & Reijnen, L. (2004). CuInS₂ thin films deposited by ALD. *Chemical Vapor Deposition*, 10, 45-49.
- Negara, D., Nindhia, T., Surata, I., Hidajat, F., & Made, S. (2019). Nanopore structures, surface morphology and adsorption capacity of tabah bamboo activated carbons. *Surfaces and Interfaces*, 16, 22-28.
- Ngai, C.F., Anuar, K., Ho, S.M., & Tan, W.T. (2011). Influence of triethanolamine on the chemical bath deposited NiS thin films. *American Journal of Applied Sciences*, 8, 359-361.
- Noraini, K., Anuar, K., Ho, S.M., Abdul, A., & Saravanan, N. (2010). Influence of the deposition time on the structure and morphology of the ZnS thin films electrodeposited on indium tin oxide substrates. *Digest Journal of Nanomaterials and Biostructures*, 5, 975-980.
- Nurhafiza, K., Sobayel, K., Munna, F., Huda, A., & Amin, N. (2021). Effect of Cd²⁺ Molar Concentration in Cd_xZn_(1-x)S Thin Film by Chemical Bath Deposition Technique Using Alternative Sulfur Precursor. *ECS Journal* of Solid State Science and Technology, https://doi.org/10.1149/2162-8777/abe58e.
- Oginni, O., Singh, K., Gloria, O., Benjamin, D., Louis, M., & Edward, S. (2019). Influence of one step and two step KOH activation on activated carbon characteristics. *Bio resource Technology Reports*, https://doi. org/10.1016/j.biteb.2019.100266.
- Qinmiao, C., Dou, X., Li, Z., Ni, Y., Chen, J., Zhou, F., Zhuang, S., & Yoshinori, Y. (2014). Study on the photovoltaic property of Cu4SnS4 synthesized by the mechanochemical process. *Optik*, 125, 3217-3220
- Orhan, B., Omer, S., & Saka, C. (2018). Sequential application of microwave and conventional heating methods for preparation of activated carbon from biomass and its methylene blue adsorption. *Applied Thermal Engineering*, 138, 542-551.
- 99. Osman, U., & Yuksel, B. (2018). The effect of carbonization temperature, carbonization time and impregnation ratio on the properties of activated carbon produced from Arundo donax. *Microporous and Mesoporous Materials*, 268, 225-234.
- 100. Othman M, Ho, S.M., Adam M, Mohanraj K (2021) A short review on Raman studies of metal chalcogenide semiconductor thin films. *Asian Journal of Chemistry*, 33, 1481-1487.

- 101. Othmane, S., Ahmed, E., Mari, B., & Hanif, U. (2016). Numerical study of the influence of ZnTe thickness on CdS/ZnTe solar cell performance. *The European Physical Journal Applied Physics*, https:// doi.org/10.1051/epjap/2015150365.
- Otmani, R., Rajira, A., Haskouri, J., & Mascaros, M. (2021). Towards a stoichiometric electrodeposition of SnS. *Applied Physics A*, https://doi. org/10.1007/s00339-020-04165-2.
- 103. Pawar, S.M., Moholkar, A.V., Rajpure, K.Y., & Bhosale, C.H. (2008). Photoelectrochemical investigations on electrochemically deposited CdSe and Fe-doped CdSe thin films. *Solar Energy Materials & Solar Cells*, 92, 45-49.
- 104. Peixu, Y., Liu, J., Zhang, W., & Li, R. (2019) CulnTe₂ Nanocrystals: Shape and Size Control, Formation Mechanism and Application, and Use as Photovoltaics. *Nanomaterials (Basel)*, doi: **10.3390/nano9030409**.
- Prasert, S., Sun, L., Lee, W., Park, H., & Kim, S. (2014). Overcoming Efficiency Limitations of SnS-Based Solar Cells. *Advanced Energy Materials*, https://doi.org/10.1002/aenm.201400496.
- 106. Qu, W., Yuan, T., Yin, G., Xu, S., Su, H., & Zhang, Q. (2019). Effect of properties of activated carbon on malachite green adsorption. *Fuel*, 249, 45-53.
- Ramonna, I., Athanasios, C., & George, Z.K. (2019). Synthesis of activated carbon from food waste. *Environmental Chemistry Letters*, 17, 429-438.
- 108. Reyers, J., Reyers, R.B., Garcia, A., Soto, E., & Cerino, F. (2019). Adsorption mechanisms of hexavalent chromium from aqueous solutions on modified activated carbon. *Journal of Environmental Management*, 236, 815-822.
- 109. Rose, C., Raj, M., & Rajendran, J. (2018). Effect of dopants on the performance of ZnSe nanoparticles as photocathode for dye-sensitized solar cell. *Journal of Nanomaterials & Molecular Nanotechnology*, doi: 10.4172/2324-8777.1000238
- Rosli, M.Y., Anuar, K., Jelas, M., Tan, W.T., Abdul, H.A., Ho, S.M., & Saravanan, N. (2010). Chemical bath deposition of NiSe thin films from aqueous solutions. *Kuwait Journal of Science and Engineering*, 37, 63-73.
- 111. Ruiz, A., Blas, M., & Estela, C. (2021). Band gap tuning of Cu(In,Ga) Se₂ thin films by electrodeposition and their subsequent selenization using a rapid thermal annealing system. *Journal of Solid State Electrochemistry*. 25, 591-601.

118 Recent Research and Innovation: An Integrated Approach

- 112. Rujun, S., Leng, Z., Gong, Q., Zhao, M., Zhuang, D., & Wei, Y. (2018). Effects of selenium atmosphere on grain growth for CZTSe absorbers fabricated by selenization of assputtered precursors. *Journal of Alloys and Compounds*, 7555, 224-230.
- 113. Runshen, Y., Jun, H., Sid, G., & Christos, G. (2011) Deposition and characterization of atomic layer deposited ZnS thin films on p-type GaSb (100) using diethylzinc precursor and hydrogen sulfide. *ECS Transactions*, 41, https://doi.org/10.1149/1.3633672.
- 114. Sai, S.S., Sandhya, R.M., & Ramaprabhu, S. (2019). Investigation of room temperature hydrogen storage in biomass derived activated carbon. *Journal of Alloys and Compounds*, 789, 800-804.
- 115. Sami, G., Salwa, H.Y., Franck, L., & Bagane, (2018), In "Amjad, K., Hamed, B.D., Nabil, K., Mohamed, K. "Recent advances in environmental science from the Euro-Mediterranean and surrounding regions: proceedings of euro-mediterranean conference for environmental integration (EMCEI-1), Tunisia 2017". Berlin: Springer.
- 116. Sanchez, H., Mis, R., Pena, J., & Camacho, E. (2021). Evaluation of pH and deposition mechanisms effect on tin sulfide thin films deposited by chemical bath deposition. *Superlattices and Microstructures*, 151, https://doi.org/10.1016/j.spmi.2021.106831.
- 117. Sanjay, K.S., & Rashmi, S. (2012). Advances in water treatment and pollution prevention. Berlin: Springer.
- 118. Saravanan, N., Anuar, K., Ho, S.M., & Atan, S. (2010). Influence of triethanolamine on the properties of chemical bath deposited nickel sulphide thin films. *Jurnal Nanosains & Nanoteknologi*, 3, 22-24.
- 119. Selhan, K., Tay, T., Ucar, S., & Murat, E. (2008). Activated carbons from waste biomass by sulfuric acid activation and their use on methylene blue adsorption. *Bioresource Technology*, 99, 6214-6222.
- 120. Sevinj, P., Asim, V., Akif, A., & Babir, T. (2021). Electrodeposition of Bi-Se thin films involving ethylene glycol based electrolytes. *Journal of Electrochemical Science and Engineering*, 11, 51-58.
- 121. Sharmistha, A., Mausumi, P., Mishra, B.K., & Shahid, A. (2015). Effect of deposition time on lead selenide thermoelectric thin films prepared by chemical bath deposition technique. *Materials Science in Semiconductor Processing*, 34, 45-51.
- 122. Shinde, S.K., Dubal, D.P., Ghodake, G., & Fulari, V. (2014). Morphological modulation of Mn:CdSe thin film and its enhanced electrochemical properties. *Journal of Electrochemical Chemistry*, 727, 179-183

- 123. Sisman, I., Alanyahoglu, M., & Demir, U. (2007). Atom-by-atom growth of CdS thin films by an electrochemical co-deposition method: Effects of pH on the growth mechanism and structure. *The Journal of Physical Chemistry C*, 111, 2670-2674.
- 124. Stalin, J., Kempaiah, D.M., Mercy, R.B., Hamid, I., Singh, G., Vinu, A., Park, D., & Naidu, S. (2019). Highly ordered mesoporous carbons with high specific surface area from carbonated soft drink for super capacitor application. *Microporous and Mesoporous Materials*, 280, 337-346.
- 125. Selhan, K., Tay, T., Suat, U., Murat, E. (2008). Activated carbons from waste biomass by sulfuric acid activation and their use on methylene blue adsorption. *Bio resource Technology*, 99, 6214-6222.
- 126. Taisuke, I., & Ando, S. (2012). Preparation and characterization of ZnS thin films by the chemical bath deposition method. *Thin Solid Films*, 520, 7076-7082.
- Tan, W.T., Anuar, K., Ho, S.M., Abdul, H.A., Ahmad, H.J., & Saravanan, N. (2010). Effect of solution concentration on MnS₂ thin films deposited in a chemical bath. *Kasetsart Journal- Natural Science*, 44, 446-453.
- 128. Tuba, C. (2019). Study of the physical properties of CuS thin films grown by SILAR method. *Optical and Quantum Electronics*, 51, https://doi. org/10.1007/s11082-019-1963-0.
- 129. Tzvetkova, E., Stratieva, N., Ganchev, M., Tomov, I., Ivanova, K., & Kochev, K. (1997). Preparation and structure of annealed CuInSe₂ electro deposited films. *Thin Solid Films*, 311, 101-106.
- Vahid, A.A., Matthew, G., Brian, W., Dariya, K., & Korgel, B.A. (2010). Thickness limited performance of CulnSe₂ nanocrystal photovoltaic devices. *Optics Express*, 18, A411-A420.
- 131. Vera, S., Jaramillo, R., Katy, H., Rupak, C., Riley, E.B., Jeremy, R. (2014). 3.88 % efficient tin sulfide solar cells using congruent thermal evaporation. *Advanced Materials*, 26, 7488-7492.
- 132. Wang, W., Xu, S., Wang, K., Liang, J., & Zhang, W. (2019). De-intercalation of the intercalated potassium in the preparation of activated carbons by KOH activation. *Fuel Processing Technology*, 189, 74-79.
- 133. Wei, P., Gong, J., Li, J., & Ge, C. (2007). Preparation and Properties of CuInS₂ Thin-Film by Successive Ionic Layer Adsorption and Reaction (SILAR) Method. *Key Engineering Materials*, https://doi.org/10.4028/ www.scientific.net/KEM.280-283.877.
- 134. Wu, F., Tseng, R., & Juang, R. (2005). Preparation of highly microporous carbons from fir wood by KOH activation for adsorption of dyes and phenols from water. *Separation and Purification Technology*, 47, 10-19.

120 Recent Research and Innovation: An Integrated Approach

- 135. Yaowei, W., Zhuang, D., Zhao, M., Zhang, W., Ren, G., & Wu, Y. (2018). Beyond 10% efficient CZTSSe thinfilm solar cells fabricated by a twostep CdS deposition process. *Solar Energy Materials and Solar Cells*, 180, 19-24.
- 136. Yang, C., Yu, Q., Zhang, L., & Feng, J. (2006). Solvent extraction process development and on-site trial plant for phenol removal from industrial coal gasification wastewater. *Chemical Engineering Journal*, 117, 179-185.
- 137. Yang, J., Jin, Z., Chai, Y., Du, H., & Wang, T. (2009). Growth and characterization of CuInSe₂ thin films prepared by successive ionic layer adsorption and reaction method with different deposition temperatures. *Thin Solid Films*, 517, 6617-6622.
- 138. Yazid, M., Anuar, K., Tan, W.T., Abdullah, A.H., Jelas, H.M., Saravanan, N., & Ho, S.M. (2009). Chemical bath deposition of NiSe thin films from alkaline solutions using triethanolamine as complexing agent. *Oriental Journal of Chemistry*, 25, 813-816.
- 139. Yilmaz, S., Unverdi, A., Tomakin, M., Polat, I., & Bacaksiz, E. (2019). Surface modification of CBD grown CdS thin films for hybrid solar cell applications. *Optik*, 185, 256-263.
- 140. Ying, Z., Song, X., Yue, X., Shen, H., Kong, X., & Xu, H. (2019). Utilization of wheat bran for producing activated carbon with high specific surface area via NaOH activation using industrial furnace. *Journal of Cleaner Production*, 210, 366-375.
- 141. Yosita, S., Liu, F., Shen, Q., & Witoon, Y. (2021). Synthesis of Pb-doped CdS quantum dot using SILAR method on mesoporous TiO₂ layer. *Journal of Physics: Conference Series*; https://doi.org/10.1088/1742-6596/1719/1/012063.
- 142. Yu, Z., Yan, Z., Liu, J., & Wei, A. (2013). Synthesis and characterization of CdSe nanocrystal line thin films deposited by chemical bath deposition. *Materials Science in Semiconductor Processing*, 16, 1592-1598.
- 143. Yun, Y., Ning, Q., Wang, D., Zhu, Q., Fu, F., Cao, R., Wang, R., Liu, W., & Bin, X. (2019). Fluffy honey comb like activated carbon from popcorn with high surface area and well developed porosity for ultra-high efficiency adsorption of organic dyes. *Bio resource Technology*, 285, https://doi.org/10.1016/j.biortech.2019.121340.
- 144. Yun, S.L., Talia, G., Oki, G., Teodor, K.T., Tayfun, G., Virgus, Y., & Guha, S. (2015). Cu₂ZnSnSe₄ thin-film solar cells by thermal co-evaporation with 11.6% efficiency and improved minority carrier diffusion length. *Advanced Energy Materials*, 5, https://doi.org/10.1002/ aenm.201401372.

- 145. Zhao, Y., Le, C., Dong, X., Zhang, H., Li, Y., & Chen, J. (2020). Effect of Ag doping on the performance of Cu2SnS3 thin-film solar cells. *Solar Energy*, 201, 190-194.
- 146. Zhaowen, C., & Chen, G. (2020). The effect of absorber thickness on the planar Sb_2S_3 thin-film solar cell: Tradeoff between light absorption and charge separation. *Solar Energy*, 201, 323-329.
- 147. Zhou, A., Wu, X., Noufi, R., & Yan, Y. (2005). 13.9% efficient CdTe poly crystalline thin film solar cells with an infrared transmission of 50%. *Progress in Photovoltaics*, 14, 471-483.

Transforming Digital Marketing with Artificial Intelligence

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Abstract

Introduction: The last decade has shown rapid development in the information technology and its application in different fields: science, business, medicine, automotive, education and Marketing etc. In the current business scenario, the Artificial Intelligence (A.I) is changing the lives of individuals as well as transforming business in various ways as well as AI is becoming the basis of new industrial transformation i.e. Industry 4.0.

Purpose: AI is in the marketing field that helps in improved performance. The present research is aimed to find out the role of AI in digital marketing by including the perspective of marketing professionals. As well as to analyze the accepted role of AI to provide a comprehensive understanding of their impacts toward the adoption of AI in digital marketing. The purpose of this study was to investigate specific factors that predict the marketing activity with the use of AI.

Methodology: This study is based on secondary data collected from various sources like: news papers, books, and journals & magazines as well as comprehensive literature review was highlighted which provided a detailed understanding of AI and the use of AI in digital marketing. The aim of the paper is to research how deeply AI is applied in marketing and what implications there are for marketing practitioners.

Findings: The outcomes of the study suggest that AI is applied in many areas of marketing. The commercial solutions are based advantage of all five AI areas: image recognition, text recognition, decision-making, voice recognition and autonomous robots & vehicles. The findings of the study highlight the factors contributing in AI integration in marketing, benefits, and challenges of AI integration in marketing, pre and post.

Research limitations/implications: The paper delivers implications for business, especially ideas about implementing AI into marketing, designing innovations and the ideas. The results of his study provide useful information about the Artificial Intelligence, which will be helpful for the Academician, Research Scholar & Practitioners etc.

Keywords: Artificial Intelligence, AI, Marketing, AI Application, AI Implications, AI in Marketing, AI, traditional marketing

INTRODUCTION

Artificial Intelligence (AI) has recently gotten an exceptionally mainstream subject in the space of the executives and promoting sciences, albeit, oddly, the deals with its advancement in different fields of science have been continuing ceaselessly for over 50 years. Throughout the long term, AI has been showing up in and vanishing from the spotlight contingent upon the level of its headway and the expansion in its expected pertinence. The premium in and the broad conversation on AI are brought about by the main wide-scale business uses of AI, which have shown the potential and the capacities of this innovation likewise in the space of advertising. The quick improvement of AI as of late has been conceivable on account of the progression of the intellectual instruments of AI and of abilities of machines to learn dependent on the got information (*Lieto, Bhatt, Oltramari, and Vernon, 2017*), just as because of the likelihood to make beforehand non-existing data (*Grawal, Gans, and Goldfarb, 2017*). The force of AI additionally lies in the range of preparing of different arrangements of information - aside from mathematical information, man-made consciousness measures messages, pictures, and sounds, furnishing them with importance and significance for additional examinations (*Dhar, 2016*).

Computerized reasoning use self-learning frameworks by utilizing apparatuses like information mining, design acknowledgment and normal language preparing. Along these lines, as far as its key business benefits over human knowledge, Artificial Intelligence is exceptionally adaptable, bringing about sensational expense investment funds. Furthermore, Artificial Intelligences consistency and rule-based projects permit endeavors to limit their mistakes. Its life span, combined with consistent enhancements and its capacity to record measures, converts into compensating business openings

Artificial intelligence has been so far drawing the consideration of designers, IT specialists, and experts, yet is presently moving external its conventional spaces of event, making an inexorably more grounded mark in the field of the board and showcasing. The consistently expanding measure of shopper information accessible on the web, in huge information frameworks or cell phones, causes AI to turn into a significant partner of promoting, as it depends on information investigation in pretty much every space of its application. Advertising exploits information generally - from purchaser needs research, market investigations, client bits of knowledge, and contest insight through seeking after exercises in different correspondence or dispersion channels to estimating the outcomes and impacts of the embraced procedures. The nearness of the two areas makes it conceivable to accomplish a collaboration impact. Subsequently, it appears to be essential to accentuation the capability of man-made consciousness and of the accessible AI-based devices and to examine the business uses of AI in the space of promoting.

The article is separated into four sections. The initial segment incorporates the critical meanings of the thoughts identified with AI. The second talks about instances of AI arrangements executed in the space of showcasing. The third part, being an impact of an investigation of the gathered models, gives a portrayal of spaces of AI's effect on promoting. The last piece of the article covers the chances and dangers fundamental the utilization of AI in promoting movement.

RESEARCH OBJECTIVES

The examination is planned to investigate the accompanying goals:

- To discover the effect of Artificial knowledge on Digital Marketing.
- > To suggest arrangements or procedures for the powerful utilization of AI innovations in advertising.
- Comparison between the Artificial Intelligence Marketing and Traditional advertising

AI IN CURRENT MARKETING AND BUSINESS SCENARIO.

Artificial Intellegence (AI) is a quickly creating field with robots affecting our lives with developing power. It has drawn in a significant spot in the new year's. With the assistance of the advances, for example, AI (ML), we could make the advances with the fit for advancing their own show by getting from the information after some time. Advertisers who announced having interest in carrying out

Advertising presently addresses the fourth biggest use instance of AI concerning assets spent, what's more, the sixth biggest industry adopter of AI innovation, with around 2.55% of the

complete business having put resources into it (Naimat, 2016). Notwithstanding the presence of AI innovation in advertising for many years, a heap of elements has added to the ascent in interest and possibility as of late. A portion of these incorporate expanded figuring capacities to deal with AI calculations at scale less expensive than any time in recent memory, Big Data and the information the board headways that accompanied it, a cresting interest in the field, and an undeniably enormous pool of profoundly gifted experts anxious to advance the business. Simulated intelligence controlled items and administrations like computerized colleagues, client assistance bots, and suggestion motors for online business and diversion entryways are only a couple instances of AI making advances into the existences of shoppers. Artificial intelligence has been sent by Indian new companies to further develop client experience by giving customized ideas, inclination based perusing and picture based item search. Extra uses for AI applications incorporate customized plan and creation, profound learning for foreseeing client interest and arranges, and productive stock and conveyance the board (Dhanrajani, 2017). In the retail location setting, shopper friendly robots can assist with helping customers by guiding them towards the fitting item supplied in a specific segment of the store. There are various item and administration recommender frameworks like the one utilized by Amazon on its shopping gateway (Sunil kumar, 2018). It monitors which things have been bought by individuals throughout some stretch of time and recognizes certain examples which are utilized to choose the items and administrations important to the client. These examples are not fixed and hard coded in the framework however are made utilizing AI strategies (Alluhaidan, 2018). Chatbot is being utilized to arrange items and administrations on the web. A chatbot has been created to arrange espresso from Starbucks. The client can arrange espresso utilizing communicated in regular language depicting the sort of espresso, and so forth and the request is shipped off the closest Starbucks unit. The installment is made naturally utilizing the pre-enlisted credit/check card (Sarah Perez, 2018).

LITERATURE REVIEW

The writing survey has been done in two sections where one piece of the writing manages the Artificial showcasing and the other part manages the conventional promoting.

ARTIFICIAL INTELLIGENCE

Davenport et. each of the (2019): the exploration has been led to examine the future changes that could be in the client practices and in the advertising approaches, driven by the teaching of Artificial insight in the showcasing. Alongside that the specialist has likewise drawn the accentuation toward the matter concerning the shopper security which could be penetrated by the AI, biasness and the morals. The Authors at last reaches the resolution that the AI in Marketing would be more viable or will give more immersed results if the AI is utilized as some assistance with the human administration as opposed to substituting it and going for full mechanization. The paper presents the full construction that how the AI will actually want to reexamine the Marketing structure later on, with greaterly affecting the showcasing procedures and the client practices.

Cannella (2018): Research has been founded on the momentum and future situation of the Artificial Intelligence in the showcasing. The examination investigations the current use of the AI in the advertising and alongside that attempts to decide the future parts of the AI in the promoting, breaking down possible spaces of progress, execution in the future to accomplish the top of the line execution. The AI has been created as an action to give the altered support of the clients through the viable examination, get-together and speculation of the information delivering higher and acceptable outcomes for the clients, advertisers and business moreover. The execution of the AI produced the huge advantages for every one individuals in the business circle. The AI has had the option to create the quality driven work in an association.

Marinchak and Forrest and Hoanca (2018): the examination has been done to comprehend the advantages and disadvantages of the ramifications of AI in the advertising , the investigation

was received to break down the pace of dispersal of AI in the showcasing and reception by the clients. The analysts have attempted to accentuate the AI application friendship on the advertisers and to the clients, where for the advertisers the progressions in the promoting cycle, assortment, abilities, phases of administrations has been refining over the ramifications of the AI in the showcasing.

Yang and Siau (2018): has led the quantitative examination to give the understanding of the advancement of the advertising and deals with the beginning of the computerized reasoning. The investigation has archived and dissected the progressions that has been purchased in the business situation with the presentation of the man-made reasoning in the advertising, deals and occupation showcasing framework. The examination has featured the hierarchical changes that has been affected by the A.I. alongside that the highlighting the reality of occupation dislodge which is brought about by the prologue to the man-made consciousness

Andre and Carmon (2017): the investigates talk about the mark of loss of command over decision of the client because of the order of the Artificial knowledge. Talking about that imaginative advances may improve or contract buyer insight that their decisions are being controlled. They examined the effect of the presentation of man-made consciousness on the decision, prosperity, client government assistance, and alongside that they likewise give the mew roads to direct future exploration to harden such truth later on.

Forrest and Honaka (2017): the examination features the remarkable commencements as progress in the correspondence abilities has been set in the hand of the advertisers through the execution of the AI in the promoting, such capacities has worked for the advertiser as well as for the clients. Where the AI has become a stage for the advertiser and furthermore for the client to foster a period of exploration and correspondence. The examination has finished up with that the clients will be a principle center of the showcasing and AI suggestion in the promoting will be appropriate based on the clients' necessities

and they need to work in the market through the AI keeping in see the prerequisites of the clients

Rekha and Abdulla (2016): the exploration has been done to consider the execution of help vector information portrayal in the immediate promoting, where the SVDD is utilized to choose the contacts base on certain models, or the order of the clients. The analyst has attempted to contemplate the new marvels of the SVDD suggestion the immediate promoting. The outcome has examined that the applying the new procedure of SVDD in the immediate advertising produces more exact outcome for the information grouping of the clients, where the SVDD strategy has had the option to eliminate the intricacies and mistakes of different strategies, in the base execution time

Kose and Sert (2015): this examination paper has talked about the tendency of the Artificial Intelligence in the substance advertising, the investigation has featured substance promoting as a methodology for accomplishing the improvement in the working of the general showcasing and the blend of the AI in the substance promoting for the over all turn of events. The investigation has been founded on the advancement of the models where the AI has been utilized to foster the substance of the showcasing for the more astute answer for the promoting issues of the cutting edge world.

Stalidiset.all (2014): considers utilization the of the computerized reasoning in the travel industry showcasing where they are utilizing the counterfeit promoting to give the huge data to the client for the knowledge of the travel industry sides. The examination depends on the review directed in Thessaloniki the travel industry, the study has been led to contemplate the neural organization classifier to foster the best approach to give wise answer for select the travel industry locales. Alongside the advancement of the emotionally supportive network which assemble and give the data to determine the questions. The aftereffect of the study has addressed the way that the Artificial insight framework has had the option to help individuals who are not master in taking care of the objective related issue on the predisposition of the data separated by the framework.

Crunk and North(2007): the exploration has considered the utilization of the AI for the different of target market for the client pool, in view of the Advance Decision Support System and Artificial insight, which can been utilized as an intend to high light and catch the expected clients. Such innovations can been utilized by the advertiser to comprehend the advantages and achievement factor of a specific product offering to be dispatched in a specific market, which make it exceptionally advantageous for the advertiser to defend the market for their product offering.

Buchner and Mulvenna (1998): they have portrayed an imaginative method of coordinating the information mining and collaborate to understand the best approach to do noteworthy promoting insight in electronic trade situation. Analyst has talked about the three classes of web mining exercises: first is asset revelation to give the platfrom to get to the information or gather the information over the web which is for the most part completed by wise specialists, data extraction from newfound pages, and speculation of the data to incorporate and utilize the data. They likewise have proposed a mix of existing on the web insightful mining and web use mining draws near and consolidates advertising ability. The such data which is accumulated through the information digging is utilized for playing out the various exercises like personalization, customization and proposals.

TRADITIONAL MARKETING

Chen (2016) has done it a relative exploration between the customary promoting and the advertising through web. The goal of the of the examination was to feature the fundamental working distinctive between the blend of conventional showcasing utilized by the advertiser and the new advancement of the promoting through the online channels. The examination has had the option to structure that the web showcasing has been created in the strides of the conventional promoting.

Geraghty and Conway (2016): the essential exploration has been directed by the analyst through the engaged meeting, to examine the customary advertising sway on the clients, where the investigation recommends the developing subjects on which the conventional showcasing must be more compelling and affordable.

Dominici (2013): the specialist has directed the examination by isolated the buyers into 2 gatherings of moderates which accepts that the customary P's of the advertising shouldn't be changed or update and afterward there is a gathering of revisionist which are of the view that the traditional P of the promoting is old and should be changed with the modernisation of the market. The paper structure the e-advertising blend, which gives the promoting an advanced view, this exploration paper doesn't examine the ramifications of the e-showcasing into the genuine business situation yet entirely structure it based on optional examination work based on the huge writing survey the hole has been recognized as the significant exploration has been led on the teaching of the man-made brainpower in the business yet vey less has been led to examine the examination of the ordinary showcasing with the arising Artificial Marketing. In this way, the examination has been directed to consider the advancement of the Artificial Marketing, alongside the variables cap are influencing it and the clients inclination toward the Artificial insight showcasing over the customary advertising

The term, AI, implies the PC assisted logical course that undertakings with forming motorized structures which can be set apart as sharp. It is the mechanized system that inputs data to coordinate tasks of adroit animals such that forms the accomplishment rate.

Paul Roetzer, who is the CEO of Marketing Artificial Intelligence Institute, concocted the construction for AI in advertising which is regularly known as 5Ps of Marketing AI. The construction was shaped for disentangling and picturing the ground and it is in accordance with the examination completed with various AI organizations and specialists on how promoting can take profit with AI (*Roetzer, 2017*). In the present world, AI is utilized to help showcasing administrators in different errands and operationsincluding computerized advertising (purchasing), web advancement, SEO, outer email advertising, lead age, web-based media checking and A/B testing (*Davenport, 2017*). The prior ideas and standards have been analyzed to handle the showcasing related issue since seemingly forever (*Wierenga and van Bruggen, 2000*) yet the significant use and execution of AI in promoting have started to emerge in recent years (*Wierenga, 2010*).

Simulated intelligence has been executed in the greater part of the organizations in this day and age yet there is as yet not an undeniable degree of execution in various organizations. Various advertisers have shown their premium in embracing AI soon and around 98% of them are presently planning for executing it totally. While, just 20% of the advertisers have executed at least one AI arrangements in 2017 in the business *(Bughin, McCarthy and Chui, 2017).*

In any case, utilizations of AI in the field of promoting are rapidly creating with various diverse programming and administrations coming up for the organizations to use for their brands.

The scientists additionally anticipated that the coming years will be a defining moment in the dispersion of AI in the field of promoting.

As advertising is the blend of subjective just as quantitative perspectives, it gives a particular opportunity to AI to develop to the areas where it isn't adequate with just econometrics (Wierenga, 2010). AI has been utilized to improve and update the obsolete strategies for showcasing (Hoanca and Forrest, 2015). Bughin, Hazan, Manyika and Woetzel (2017) expressed that with the assistance of AI, organizations can be fruitful in making redone promoting efforts by dissecting the information. Computer based intelligence will likewise help in further developing yield the board by introducing dynamic estimating and give phenomenal client service. Marketing the executives needs the chiefs identified with the market to address the issues. and lead showcasing choices (Wierenga and van Bruggen, 2000). The programming which has been exceptionally perceived in the promoting is advertising the executives emotionally supportive networks (MMSS)which permits the supervisors to settle on the choices, dissect the information and data with the assistance of AI *(Wierenga and van Bruggen, 2000).* More unequivocally, it is an information driven instrument which helps in the dynamic through looking at the data with the improvement of AI.

ROLES OF AI IN TRANSFORMING DIGITAL MARKETING

Artificial Intelligence is not normal for the regular insight which is shown by the machines. It includes cognizance and feelings in the machines. The insight showed by the machines is comparable like people and creatures. The man-made consciousness is changing the client experience for the computerized advertisers. The proficiency of advanced advertising is expanding and it is improving the experience of the client with the computerized reasoning. The Artificial Intelligence is raising the experience of clients to another degree of fulfillment. Simulated intelligence is changing the advanced systems to further develop the consumer loyalty. The normal illustration of Artificial Intelligence is the Chatbot's to give the client the best degree of involvement. Your Chatbot's are dynamic day in and day out while everybody is dozing your chatbots are working for you without feeling dazed and feverish. The computerized promoting is working on the systems and making it advance to give the significant client bits of knowledge (Haripriya Sakthivel, 2016). Through Artificial Intelligence the assortment of information, examining the information subsequent to handling the information it very well may be put away for the sometime in the future. The man-made consciousness is working on step by step and organizations are utilizing these innovations to further develop the computerized promoting procedures. Furthermore, it is giving the important understandings and vision for the organizations. The artificial insight is fundamental in future and advanced items are the need of time and making the computerized promoting to worked on level. The computerized reasoning is giving the advanced future to the items and the organizations.

Conclusion

Innovative headways have consistently helped organizations by setting out new open doors for arriving at clients. One of most noteworthy innovations within recent memory is Artificial Intelligence (AI) which is making an incredible buzz in the advanced space. Given its potential for narrating and promoting, Artificial Intelligence in B2B deals and showcasing is here to change the manner in which individuals interface with brands, data and administrations. The universe of B2B showcasing and its future is ready to be moved by Artificial Intelligence. A decent modest bunch of big business monsters fear full robotization of showcasing developments through brilliant Artificial insight innovation, nonetheless, estimating the impact of AI-controlled robots in numerous client assistance ventures, one can certify that understanding client subtlety won't be altogether manual or overseen by human force alone. Man-made brainpower made its essence felt for the current year through its beneficial cycles like huge information, Internet of Things and Machine Learning. However, these are just segments that will ultimately contribute towards unleashing the maximum capacity of AI. The coming years, especially 2018 would see noticeable changes and effect because of the utilization of AL

Man-made brainpower is consistently turning into an engaging instrument for computerized advertisers and chips away at the secrets to get the information from an individual or the gathering of individuals to and make your image a tremendous one. It is protected to say that Artificial knowledge is a gotten speculation, which makes certain to get profits.

Recommendations

Statistical surveying is the most significant movement in the field of advertising to evaluate the buyer conduct towards any organization or brand. How far does the brain science of the shopper impact the exhibition of any item was essentially

seen? Best level has been attempted by me to introduce the real factors effectively however as advertising research is anything but a genuine science consequently specific level of adjustments are conceivable in the examination report. The study has inferred that yes in spite of the fact that there has been significant severe toward the AI yet its legitimate execution would set aside some effort for the over all appropriation fair and square of the clients likewise and fair and square of organizations moreover.

India has an exceptional chance right now. Utilizing the ability accessible inside the country, it can rehash the example of overcoming adversity of IT industry. Simultaneously, if vital advances are not taken on schedule, it will lose the chance. Simulated intelligence can help in the significant projects of the Government viz. Computerized India, Make in India, and Skill India (Vempati, 2016; Ghosh and Mitra, 2017). To speed up improvement of AI innovation and its applications, it is important to make strides for Applications and Infrastructure Development, Policy and Regulations, Research and Development and Human Resource Development.

Paradigm Shift: Some specialists imagine that with the accessibility of amazing information investigation innovation, rearranged (showcasing) choices are likewise accessible. Indeed, information dispersal, the scattering and accessibility of savvy information, is probably going to be a basic point for the achievement of promoting knowledge applications. The premise and outcome of this is a corporate culture which first goes to these specialized advancements. Insight dispersal must, in any case, be coordinated. Contact the board between information directors in promoting and the individuals who can and should utilize their information - for instance in deals, dissemination or buying - is just one wellspring of likely achievement. As per Saidan, M. N., Al-Yazjeen, H., Abdalla, A., Khasawneh, H. J., Al-Naimat, H., Al Alami, N., ... & Sowan, N. (2018) Success in advertising knowledge is hence additionally subject to inward organization informal communication. In this regard, large information advertising requires an information related information culture in numerous organizations.

References

- 1. Alluhaidan Ala. (2013). Recommender System Using Collaborative Filtering Algorithm. Technical Library
- André, Q., Carmon, Z., Wertenbroch, K., Crum, A., Frank, D., Goldstein, W., ... & Yang, H. (2018). Consumer choice and autonomy in the age of artificial intelligence and big data. Customer needs and solutions, 5(1), 28-37.
- Bell, M. L., Zanobetti, A., &Dominici, F. (2013). Evidence on vulnerability and susceptibility to health risks associated with short-term exposure to particulate matter: a systematic review and meta-analysis. American journal of epidemiology, 178(6), 865-876.
- 4. Bughin, J., Hazan, E., Ramaswamy, S., Chui, M., Allas, T., Dahlstrom, P., ... & Trench, M. (2017). Artificial intelligence: The next digital frontier?.
- Crunk, J., North, M. M., & North, S. M. (2012). A Software Engineering Tool for Pedagogy: Reporting Performance Test Results. In Proceedings of the International Conference on Software Engineering Research and Practice (SERP) (p. 1). The Steering Committee of The World Congress in Computer Science, Computer Engineering and Applied Computing (WorldComp).
- Da Silva, L., Collino, S., Cominetti, O., Martin, F. P., Montoliu, I., Moreno, S. O., ... & Guiraud, S. P. (2016). High-throughput method for the quantitation of metabolites and co-factors from homocysteine– methionine cycle for nutritional status assessment. Bioanalysis, 8(18), 1937-1949.
- Davenport, T., & Harris, J. (2017). Competing on analytics: Updated, with a new introduction: The new science of winning. Harvard Business Press.
- 8. Davenport, T., &Kalakota, R. (2019). The potential for artificial intelligence in healthcare. Future healthcare journal, 6(2), 94.
- Dhanabalan, T., &Sathish, A. (2018). Transforming Indian industries through artificial intelligence and robotics in industry 4.0. International Journal of Mechanical Engineering and Technology, 9(10), 835-845.
- 10. Dhanrajani. (2017). Bracing for impact of AI led disruption. NASSCOM Community Blog
- 11. E. Maltz, A.K. Kohli (1996), "Market Intelligence Dissemination across Functional Boundaries", Journal of Marketing Research, Vol. 33, No. 1, .

- 12. Forrest, E., &Hoanca, B. (2015). Artificial intelligence: Marketing's game changer. Trends and innovations in marketing information systems, 45-64.
- Geraghty, G., & Conway, A. T. (2016). The Study of Traditional and Nontraditional Marketing Communications: Target Marketing in the Events Sector.
- 14. Haripriya Sakthivel. (2016, September 28). AN ANALYSIS OF DIGITAL MARKETING: CUSTOMERS' AND MARKETERS' PERSPECTIVE
- 15. Jarek, K., &Mazurek, G. (2019). MARKETING AND ARTIFICIAL INTELLIGENCE. Central European Business Review, 8(2).
- 16. Khokhar, P. (2019). Evolution Of Artificial Intelligence In Marketing, Comparison With Traditional Marketing. Our Heritage, 67(5), 375-389.
- 17. Kose, U., &Sert, S. (2017). Improving content marketing processes with the approaches by artificial intelligence. arXiv preprint arXiv:1704.02114.
- 18. Lieto, A., Bhatt, M., Oltramari, A., & Vernon, D. (2018). The role of cognitive architectures in general artificial intelligence.
- Martínez-López, F. J., & Casillas, J. (2013). Artificial intelligence-based systems applied in industrial marketing: An historical overview, current and future insights. Industrial Marketing Management, 42(4), 489-495.
- Masci, F. J., Laher, R. R., Rusholme, B., Shupe, D. L., Groom, S., Surace, J., ... & Kulkarni, S. R. (2018). The zwicky transient facility: Data processing, products, and archive. Publications of the Astronomical Society of the Pacific, 131(995), 018003.
- Masci, F. J., Laher, R. R., Rusholme, B., Shupe, D. L., Groom, S., Surace, J., ... & Kulkarni, S. R. (2018). The zwicky transient facility: Data processing, products, and archive. Publications of the Astronomical Society of the Pacific, 131(995), 018003.
- Mathelier, A., Fornes, O., Arenillas, D. J., Chen, C. Y., Denay, G., Lee, J., ... & Wasserman, W. W. (2016). JASPAR 2016: a major expansion and update of the open-access database of transcription factor binding profiles. Nucleic acids research, 44(D1), D110-D115.
- Rekha, A. G., Abdulla, M. S., &Asharaf, S. (2016). Artificial Intelligence Marketing: An application of a novel Lightly Trained Support Vector Data Description. Journal of Information and Optimization Sciences, 37(5), 681-691.

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- Saidan, M. N., Al-Yazjeen, H., Abdalla, A., Khasawneh, H. J., Al-Naimat, H., Al Alami, N., ... & Sowan, N. (2018). Assessment of on-site treatment process of institutional building's wastewater. Processes, 6(4), 26.
- 25. Shahid, M. Z., & Li, G. (2019). Impact of artificial intelligence in marketing: a perspective of marketing professionals of Pakistan. Global Journal of Management and Business Research.
- Stalidis, G., Karapistolis, D., &Vafeiadis, A. (2015). Marketing decision support using Artificial Intelligence and Knowledge Modeling: application to tourist destination management. Procedia-Social and Behavioral Sciences, 175, 106-113.
- 27. Sterne, J. (2017). Artificial intelligence for marketing: practical applications. John Wiley & Sons
- Sunil Kumar Srivastava. (2018). Artificial Intelligence: way forward for India, Journal of Information Systems and Technology Management, 15.
- Van der Lans, R., Van Bruggen, G., Eliashberg, J., &Wierenga, B. (2010). A viral branching model for predicting the spread of electronic word of mouth. Marketing science, 29(2), 348-365.
- Yang, Y., &Siau, K. (2018). A qualitative research on marketing and sales in the artificial intelligence age. Midwest United States Association for Information Systems (MWAIS) 2018 proceedings.

The Impact of Productivity on Profitability in Banking Sector in Oman

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Abstract

The banking and finance sector is one of the most important sectors in Oman. There are many companies in this sector, some of them listed in Muscat securities Market (MSM) and many of them outside of MSM. Generally, this sector is profitable and attractive for many investors from Oman, GCC countries and foreign investors. This chapter analyzed the relationship between productivity and profitability in financial sector in Sultanate of Oman. The data were collected from the annual reports of 29 finance companies listed on Muscat Securities Market for 5 years from 2010-2014. This chapter deals with two models for the relationship between productivity and profitability. The chapter started with the productivity in general and then analyzes the productivity in banking sector.

Keywords: Productivity, Profitability, Financial Sector, Oman

INTRODUCTION

The prospective advantage of improved productivity in banking and finance sector can be significant, given the influence of their services on resource distribution and competitiveness in the wider economy. With no hesitation, these concerns were given high priority in the thinking of policy makers recently when important deregulation of financial sector was undertaken in Oman. Still, in spite of long years of reform, the extent of measured labor productivity in the banking and finance sector is below the course of the last business cycle. But the exact environment of this sector, involving its progressively service-oriented focal point, the out of the market value of its output, and the role of rapid technological innovation, has complicated the analysis of its productivity performance.

Against that background, this chapter briefly discusses some of the conceptual issues associated to measuring productivity in the finance sector. It examines a range of productivity indicators for the finance and banking component of the sector, with particular reference to financial companies registered in Muscat Security Market (MSM). An assessment of these indicators at the company level may thereby highlight on real productivity performance in the banking and finance sector during the period 2010-2014.

There are several researchers who try to clarify and propose the effects of productivity on profitability of a firm. In general, the term profitability is more often defined as the link between inputs and outputs in a certain organization (system). Productivity can be computed or calculated from single, multiple and totalfactor opinion (views). The single measures symbolize the link between outputs and equipment, labor or ability space. Multiple measures like the relationship between outputs and employment in addition to materials. The total factor productivity measure includes all probable factors of production into a scheme. On the counterpart, the term profitability shows the potential to often make profits over the finite period of time. As result, there are many ratios that conceal this consequence, for example, the ratio of outputs divided by inputs (such as revenue divided by cost or
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profit divided by cost) or of outcomes divided by outcomes (such as profit over revenue or revenue from rework over revenue). The two terms productivity and profitability are part of the basic seven performance standards (innovation, effectiveness, quality of work life, efficiency and quality) in which a firm needs to evaluated, analyzed and measured. Basically, the characteristic to become more profitable is productivity whereas influences from productivity twig from quality of work life and other residual performance criteria. Figure 1 explains the connections among the seven performance standards.



Figure 1- The Interlink between 7 Performance Standards

Source: The Atlantic Canada Opportunities Agency. (1998)

For long years back, the industrial, finance and services sectors in Sultanate of Oman have been facing fluctuations (ups and downs) in the achievement (performance) as per profitability and productivity. Thus, it is essential to explore the performance of these sectors and test how they can achieve the targeted aims and operational expertise.

The banking and finance sector add to sustaining and support small and medium enterprises and provides jobs and decrease unemployment as the structures, measures and laws that have been introduced to enhance confidence in it. Also the banking system of Oman allows clients to obtain outstanding services contributing to diversify and increase their role in the national economy. Omani banking sector present an important role at the level of the economy which led to increasing the efficiency and stability of the banking system of Oman. The objective of this chapter is to discuss the relationship between the productivity and accounting profitability in terms of return of assets and net operating profit.

MEASURING THE PRODUCTIVITY

The theoretical and practical problems that scourge the measurement of corporeal output in most service business are principally severe in the banking sector, where there is no clear assent on proper definition of output. For instance, as banks involve in intermediation, are their deposits to be considered as an input or an output? The mainly general reply to this problem is to test indicators of productivity in the banking sector that are commonly taken from accounting data. The justification for these accounting measures is that productivity enhancements should indicate that a lesser level of costs or employment is needed to deal with a given level of assets, or to generate a given level of income.

The concept and definition of productivity as applied in manufacturing industries cannot be applied as such in banking industry because it is primarily a service industry. In the field of banking, the various products are accounts, drafts, exchange remittances, cheques, traveler's cheques, credit cards, debit cards, services for guarantees, various kinds of loans like housing loan, education loan, car loan etc. Identification and measurement of output in banking is very difficult exercise as it is not possible to bring various services to measure output.

In general, the productivity refers to the relation between inputs and outputs. Practically, productivity has many definitions based on the researcher's point of view and the context in which it is used. According to productivity means "a relationship between output produced by a system and quantities of input factors utilized by the system to produce that output". Productivity is closely connected to the use and availability of resources. The productivity will increase if the company properly use the resources and vice versa. On the other side, productivity is closely connected to the creation of value. The high productivity is achieved when activities and resources in the process add The Impact of Productivity on Profitability in Banking Sector in Oman 143

value to the products or services produced by the company. There are three main sub-concepts of productivity. The first one is the technological concept which means the ratio of outputs to inputs. The second one is the engineering concept which is the relationship between actual and potential outputs. The third one is the economic concept that is the efficiency of resources allocation. The main other issue is the measurement of productivity. There are many measurements of productivity and each one depends on the availability of data, nature of firm or output and input and the objective of productivity measurement.

There are three categories to measure the productivity; total factor productivity (TFP); single (or partial) factor productivity (SFP) and multifactor productivity (MFP). Total factor productivity is the combined or weighted average of productivity of all inputs. The single or partial factor productivity is the productivity of a single factor of input. The multifactor productivity is a comprehensive and analytical to measure the changes in productivity. The multifactor productivity is the ratio of output to the sum of two or more inputs for the same period.

There are "well-known approaches / methods adopted for analysis of productivity" such as "Kendrick-creamer model, Craig-Harris model, American productivity center model and Productivity accounting model".

In this Chapter, we are depending on the Productivity accounting model. This model was introduced by H. S. Davis. In 1955, Davis published a book titled "Productivity Accounting" in which he presented a productivity index model. This model is depending on the accounting information provided by accounting system which isolated all other external information such as price inflation. The formula of productivity under this model as follows:

Productivity is the link between amount produced (production) of goods and services and the inputs of factors of production

used in the production practice, with the relationship generally articulated in ratio form. The ratios may relate to the nationwide or worldwide economy, to one industry, or to a corporation (Small and Medium Enterprises).

Due to The Atlantic Canada Opportunities Agency (Report 1998) (Figure 1) as well as Davis, productivity measures are sub-divided into partial and total factor productivity measures. The first are defined as the association between output and one input, such as labor or capital, while the second stand for the link between output and an index of two or more inputs.

Productivity is find out by a number of factors, involving the amount and availability of natural resources, industrial formation, capital buildup, the speed of technological advancement, excellence of human resources and the macroeconomic and the microeconomic environments.

According to the total productivity formula, changes in input and output have to be measured comprehensively of both quantitative and qualitative changes. In application, quantitative and qualitative changes take place when relative quantities and relative prices of different input and output factors change.

The measures of partial productivity are material measures, nominal price value measures and fixed price value measures. These measures differ from one another by the variables they measure and by the variables taken out from measurements. By not including variables from measurement makes it possible to better focus the measurement on a given variable, yet, this means a narrower approach.

PRODUCTIVITY IN BANKING AND FINANCE SECTOR IN OMAN

Productivity is one of the most important issues in the Gulf Cooperation Council (GCC) countries because it is a vital indicator of economic performance of an economic system. Also, productivity has a strong relation with sustainable development. Now, most of GCC countries, especially in the Sultanate of Oman, try to invest out of the oil and gas field. In Oman, up to the mid of 2014, there are (1468) industrial projects with 4.2% growth rate. On the other side, the amount of growth rate in the size of investment in the industrial sector amounted 27%.

In the banking and finance sector, the total assets for all banks working in Oman are 58.1 billion US dollar at the end of 2013 with notable increases in the products of these banks. Also, Omani government gave the private sector more freedom were most of services are provided by this sector. This is because the Omani government is depending on economic diversification principle since the collapse of oil and gas in 1986 and it encouraged the establishment of new projects in all economic fields out of oil and gas area.

Despite this growth rate and other good indicators, there is a very crucial question regarding the productivity in the companies listed in the sector in Muscat Securities Market (MSM). This question is: What is the relationship between productivity and accounting profitability in banking and finance sector in Oman? This question is very important because the Omani economy was depending on the oil and gas since the 70s of the last century till the late of it. After 40 years, it is very important to assess the relationship between the productivity and accounting profitability in terms of return on assets and net operating profit. As of the end of May 2014 the institution boasted total assets of OR7.35bn (\$19.03bn).

The banking sector posted solid growth in 2013 and the first half of 2014, on the back of improving asset quality, coverage and capital adequacy, a burgeoning Islamic banking segment and significant expansion in the economy. The industry comprises 16 conventional commercial banks – including seven local and nine foreign institutions – as well as two sharia-compliant banks, two state-owned specialised credit banks and a handful of non-deposit-taking leasing companies. As of the end of June 2014, the total asset base of commercial banks in Oman was OR24.6bn (\$63.8bn), up from OR22.4bn (\$58bn) at the end of 2013 and OR20.9bn (\$54.1bn) at the end of 2012, according to CBO data. Commercial banking institutions reported profits of OR351.3m (\$910m) in 2013, up from OR305.3m (\$791m) the

previous year. These figures are in line with growth in the broader economy. Indeed, between 2011 and 2013 Oman saw average GDP growth of 10.2%. During the same period the sultanate's inflation rate was just 2.7%. In recent years bank profits have grown on the back of increases in both deposits and lending. Indeed, credit allotments made up 68% of total banking assets in Oman in 2013, up 6% on the previous year, while deposits grew 10% over the same period, from OR14.2bn (\$36.8bn) at the end of 2012 to OR15.6bn (\$40.4bn) at the end of 2013. Even as lending increased, non-performing loans (NPLs) as a percentage of total credit issued decreased from 2.2% at the end of 2012 to 2.1% at the end of 2013, according to CBO data. Retail issuance currently constitutes 35-40% of most banks' loan books; though this figure is expected to drop in the coming years as banks work to meet the CBO's new lending ratios. According to local media reports, government deposits account for approximately one-third of total commercial banking deposits.

SUMMARY AND CONCLUSIONS

The relationship between the productivity and accounting profitability in terms of return of assets and net operating profit is measured in banking sector. The productivity is measured by the relationships between cost of sales and number of staff.

The productivity can serve as an indicator to improve the profitability. This is true but may be only in certain sectors other than banking sector because banks in Oman are less in number (about 20% of number of companies in the finance sector) and most of them are new.

Banking sector in Oman, though performing relatively to the size of its units, shows indicators of some deficiencies in technical efficiency

References

 Alsughayir, A. (2013). The impact of quality practices on productivity and profitability in the Saudi Arabian dried date industry, *American Journal of Business and Management*, 2 (4):340-346, DOI: 10.11634/216796061302465. The Impact of Productivity on Profitability in Banking Sector in Oman 147

- Anwarul Islam, K. M. and Zaman M. (2013). An empirical study on effect of productivity on profitability in some selected private commercial banks (PCBs) in Bangladesh, *International Journal of Economics and Finance*, (5) 12, 151-162, DOI:10.5539/ijef.v5n12p151.
- 3. Eatwell, J.M. and Newman, P. (1991). The new Palgrave: A dictionary of economics, 3(4) and (12), Macmillan, Tokyo.
- Eslava M., J. Haltiwanger, A. Kugler, M. K. (2004). The effects of structural reforms on productivity and profitability enhancing reallocation: evidence from Colombia, Journal of Development Economics, (75), 333–371. DOI:10.1016/j.jdeveco.2004.06.002.
- Ghasemi, A., Zahediasl, S. (2012). Normality tests for statistical analysis: A guide for non-statisticians, *International Journal of Endocrinology* and Metabolism 10(2), 486- 489.DOI: 10.5812/ijem.3505.
- Gumułka, M., K. Bannanś, M. R. (2009). Relationship of productivity and profitability of broiler chicken production to incidence of avian influenza in wild birds in Poland, *Annals of Animal Science*, 9 (1), 89 – 97.
- 7. Gupta, R., and Dey, S. K. (2010). Development of a productivity measurement model for tea industry, *ARPN Journal of Engineering and Applied Sciences*, 5 (12), 16-25.
- Kouser, R. T., Bano, M. and Azeem, M. U. (2012). Inter-relationship between profitability, growth and size: A case of non-financial companies from, *Pakistan journal of commerce and social sciences*, 6 (2), 405-419.
- 9. Muscat Securities Market Report. (2015). Companies guide. https:// www.msm.gov.om. (Accessed 2 September 2015).
- Owyong, D. T. (1997). Productivity growth: theory and measurement, *APO Productivity Journal*, www.apo-tokyo.org/productivity/016_prod. pdf,(Accessed 27 July 2015).
- Pekuri, A., Haapasalo, H. and Herrala, M. (2011). Productivity and performance management – Managerial practices in the construction industry, *International Journal of Performance Measurement*, (1), 39-58.
- 12. Rabobank. Country Report Oman Rabobank, Economic Research. (2014). https://economics.rabobank.com/publications/2014/ september/country-report Oman.
- 13. Tangen, S. (2002). Understanding the concept of productivity. Paper Presented at the 7th Asia Pacific Industrial Engineering and Management Systems Conference (APIEMS2002), Taipei.

148 Recent Research and Innovation: An Integrated Approach

- 14. The Atlantic Canada Opportunities Agency. (1998, March). Productivity: Key to economic success. Report Centre for the Study of Living Standards.
- 15. Wazed, M.A. Ahmed, S. (2008). Multifactor productivity measurements model (MFPMM) as effectual performance measures in manufacturing, *Australian Journal of Basic and Applied Sciences*, 2(4), 987-996.
- 16. Yu, X. (2014). Productivity, profitability, investment and corporate growth: Evidence from China's manufacturing. Paper to be presented at the DRUID Academy conference in Rebild, Aalborg, Denmark, January 15-17, 2014.

Entrepreneurship Policies and Regulations in the GCC Countries

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INTRODUCTION

The Cooperation Council for the Arab States of the Gulf (GCC) is a county of 6 states: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and UAE. In total they have inhabitants of all most 49 million people. The GCC is an oil-based county with the biggest confirmed crude oil reserves in the world which represent about 36% of the world's total. The GCC region positions as the biggest producer in addition to exporter of petroleum and represents a leading role in the world in general and Organization of the Petroleum Exporting Countries) OPEC in particular. Thus this region is a vital source for the global economic stability.

The economic approach of GCC countries depends on oil and gas as the major sources of fiscal revenues (in 2015 oil and gas revenues represented 46% of the six Gulf countries' GDP) and with respect to exports (oil and gas account all most for 75% of

total exports), while the government is the main actor in the economy that obtains the revenues from oil exports and manage the expenditure.

Oil revenues have motivated the economic growth in the GCC countries through the last fifty years. As the governments in GCC control this area, it has turn out to be the major player in the economy on the account of the private sector. Yet, changeable oil prices with its matching impact on government returns illustrates that the GCC form or model of economic development, as doing well as it has been in guiding to globe criterion infrastructure, public services (e.g. health, education, etc.), has its limitations and weaknesses. Economic growth/development in the GCC has been financed and funded through government spending; though this might not be continuing or sustainable into the long run. A rapidly increasing population with rising costs of maintaining a large public sector implies that it is not possible to absorb the large number of nationals that will be active for employment. Even if the GCC countries could expand their public sector, it would be through relying on the revenues from the export of a single commodity, which for some GCC countries is now rapidly dwindling both in terms of reserves and production. With falling oil reserves and the development of substitutes of hydrocarbons the GCC countries have an urgent need to diversify their economies. So there is urgent need for new motivations policies and regulations to build a culture of entrepreneurship as well as support mechanisms to ensure that SMEs become successful into the long run.

The current economic condition of lower and unstable oil prices, broaden fiscal deficits, increasing competition and high youth unemployment signify a challenging economic situation for a region that is still controlling a very significant share of the world's energy supply. So the present condition in the GCC countries necessitates a shift from the classic state economy to a situation where private sector can play a vital role in economic diversification through entrepreneurship. In this case creative policies and regulations should be designed

This chapter is progression exercise mostly depends on examination and analysis of authorized laws and regulations, especially the basic rules that govern investment, and rules and regulations govern companies. Other resources in addition comprised official certified country information and from documented self-determining bodies. This Chapter therefore is based on publicly available information, it comprises a ground work appraisal of the entrepreneurship and investment policies of the six states need to be expanding and validating to offer for policy suggestions.

All over the world and in all countries Small and medium enterprises (SMEs) usually constitute the biggest share of businesses and subsidize expressively to the economy in terms of creation of employment, enhancement in productivity, implementation of technology, leading innovation and accumulation of capital. Thus, it is essential that governments generate an environment and policies (rules) that permits for the growth of a strong and lively SME sector that is worldwide competitive. This is significant policy issue for the resource rich six stats which, up to the finding of oil, had small in the way of a commercial sector. After the discovery of oil the government sector has played a vital role, maintained by revenues from the oil sector, however it is uncertain as to whether this model is going to continue (sustainable) in the long run. The statistics and information in GCC countries show that, the economic share of SMEs is inadequate except in some cases. Part of essential actualities about their contribution might be stated, given the fact that SMEs set up almost above 90% of companies in each country in the region. A substantial portion of SMEs is dynamic in the trade sector; while other important sectors involve small workshops, like small shops, hotels and restaurants. They are not as much of important in industry and other capital-intensive sectors. Hence, in current years all GCC countries have given much larger emphasis on supporting entrepreneurship, particularly among their own citizens. Data provided by each of the GCC countries indicates that the number of business start-ups has increased and policies and rules have been developed to support SMEs. With, these policies and their development and the support of governments many programs are transferable in nature through the provision of small loans, training and access to business accelerators and incubators. Proof indicates that these transactional sustenance tools have assisted to raise the run of new business start-ups and, to some degree, their existence beyond the initial stage of development. There is, even so, slight, if any, prove to support their influence in increasing the competitiveness of the SME sector. This is a key policy issue for the GCC countries because of their necessity to diversify their economies away from the oil sector over a solid and maintainable private sector. The minor local market size and the openness of each individual country within the GCC indicate that if SMEs are to be effective then they need to trade globally and be able to compete in the global marketplace.

GCC countries start to work hard to diversify their economies, reduce unemployment and to create model for sustainable development and growth. Governments take actions to develop private sector by promotion of SMEs and entrepreneurship to be a fundamental features of the broader economic reform driver. The promotion and advancement of SMEs and entrepreneurship includes various policy actions counting to make stronger business environment and regulations. Public and private sectors also prop precise types of companies, economic actions or entrepreneurs throughout small funds, donations, credit assurances, export upgrade, development of business services and knowledge transfers, among other actions.

The diversity of the SMEs and the title role of their strategy in socio-economic progress actions comprise too much number of organizations: governmental and non-governmental, as well as countrywide and part of the country. This chapter tries to examine the rules, regulations and policies of entrepreneurship in the GCC countries that incorporates the importance of the SMEs sector alongside the drivers of entrepreneurship and the government support mechanisms as well as policies that have been developed in each of the GCC countries.

BACKGROUND ON ENTREPRENEURSHIP POLICIES AND REG-ULATIONS IN THE GCC STATES

SMEs, seem to be the spine of whichever efficacious and maintained economy besides being frequently taken to be the major engine of improving the economy, progress and diversiform of whatever economy. Whereas the developed countries understood this reality many years before, the Gulf countries channel documentation is principally feeble in spite of powerful business pioneer (entrepreneurial) traditions and the big volume of small and medium enterprises. As an example, SMEs constitute more than ninety percent of the overall listed enterprises in nearly all GCC region, but still their participation to total gross domestic product (GDP) stays considerably minor, if we exclude United Arab Emirates - the biggest diversified economy in the area, as match up to industrial markets. In the United Arab Emirates, SMEs participated to more than 60 % of the gross domestic product and supplied 80 % of private-sector employment, while their participation to GDP in other GCC countries was less than 35 %.

A considerable part of literature has been written on GCC economic diversification from different viewpoints. The transfer of the economy from oil reliance to economic divergence (branching out) in the region highlights the economic threats related with entire government approach and the Dutch Disease approach, which claims that natural resource gaining frequently end up in dwindling (weakening) other sectors as a result of money overvalued and the charming more returns in the means sector. The trade and industry danger of Dutch Disease theory prop such explanations since oil returns have a propensity to quickly concurrence to some extent additional economic action; hence the best way to control the risk is to diversify the GCC economies. With regard to GCC region it is essential to diversify the economy, not because of reducing the destructive influences of the instability of oil prices, but the diversified economy have tendency of becoming more unchanging and also the capacity of generating more occupations will increase while being less vulnerable to business cycle created by oil and gas prices

fluctuations. So since 1995, diversification has become very essential for any economic development policies and planning. In any long-term planning, it is very clear that all GCC countries have assured the significant of encoring self-employment for its national people plus offering many kinds of support and transfer to free market economy system to make the private sector the dominant sector in carrying out the development process in the economy.

Entrepreneurship is main solution for economic diversification, employment formation and sustainable growth particularly in the GCC region. Although for a lot of years the role of self-employment (entrepreneurship) in the economy has not overlooked by many economists, Joseph Schumpeter realizes its contribution, mainly in a development perspective. Besides that, Schumpeter showed the worthy mixture of entrepreneurship and innovation. Current literature shows that economists have understand that the extent to which the entrepreneur will connect in innovation and specialization depends on the policies and rules to regulate the establishment of SMEs. But the functioning of policies and rules needs the action of different government and private institutions, such as property rights and rules to enforce contracts. A well-defined structure of property rights and an apparatus of market regulation to ensure competition are "good" institutions, which assist innovation and entrepreneurship and help the economic growth of a country.

Diversification policies and rules considered to assure a continuous exploitation of oil income to diversify the economy were not extremely prevalent in the midst of politicians and planner in the area throughout the first oil flourishing in mid-seventies. The realization of this even come late at the beginning 21st century, where GCC states progressed perfect long-standing divergence policies and strategies. The GCC implement these policies in their long-run plans and visions, like Oman 2020, Abu Dhabi 2030 and Bahrain 2020 secured and fixed the long-standing development plans purposes in addition to the sector main concern for forthcoming economic diversification. In a few states, short-run strategies and plans recreated to put into practice these policies

and regulations. The governments till now continue to determine common directions of upcoming divergence of sectors and economic advances. The government can lead the application; however this is not the situation now, where big corporations in GCC region till now are belonging to government established in a direct way using domestic capitals coming from the value of oil exports. "With respect to the Economist Intelligence Unit (EIU), in the GCC "the importance and role played by the private sector is growing, but the government and public-sector companies stayed supreme importance in influencing growth strategies and regulations, ranking projects in priorities and financing growth."

The role played by the non-government sector in having diversified economy exertions has enlarged in the last years: "Contrasting the 1970s oil boom, the private sector engage in recreation a more dynamic role in the 2002–2008 booms. The private sector progressed from a just retire private sector into a sector carry out by skillful entrepreneurs who find themselves compulsory compete more substantially so as to win contracts and guarantee business access".

The improvement in real estate industry in the United Arab Emirates was mainly done by business men in the non-public sector, where the commercial banks provide loans and funds and not by the government. The role played by the private sector is due to the improvement and development in entrepreneurship policies and regulations which participate largely in the ease of doing business in GCC countries (see table1)

Table 1 Rankings of the GCC states 2006 to 2009 in Doing Business

Country	Doing Busi- ness 2009	Doing Busi- ness 2008	Doing Busi- ness 2007	Doing Business 2006
Kingdom of Saudi Ara- bia	16	23	38	35
Bahrain *	18	Not available	Not available	Not available

Qatar *	37	Not available	Not available	Not available
UAE	46	68	77	68
Kuwait	52	40	46	40
Oman	57	49	55	52

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Source: World Bank 2009, Doing Business Report

DB= Doing Business

* Before 2009QatarandBahrain where not involved in the index.

The improvement process of policies in GCC nation state has supported through a clear number of policies and regulations over the last years since the index of ease in doing business was established. The six GCC countries achieve the highest rank between. Middle East and North Africa (MENA) nations. The mean classification of GCC countries is 38, whereas the mean rank of the residual states in MENA district is 114.

The reforms (policies and regulations) carry out in 2007/2008 which are stated in the 2009 Doing Business report pathway every policy reform that has made it easier or more difficult to establish, run and end a business. In the GCC nations, such policies and regulations (reforms)has generally been started within five zones; precisely in the (1) 'simplicity of opening companies,' (2) 'receiving loans' (3) loans data, (4) 'registering property' and (5) reconstructs to simplify 'trade between nations.' The World Bank believes on the above reforms to be at ease forms of corrections to do, in the meantime they can usually be undertaken over and done without any substantial lawful modifications or include tough politically aware compromises. If one think of changes in labor laws concerning how to hire and fire workers and subjects associated to taxation, then the political implications would be considerably more difficult.

It is observed from table 1 that, Kingdom of Saudi Arabia has upgraded its position of classification considerably. It has relocated from a 35th place to 16. If these undertaken policies and regulations (reforms) lead can be continued, GCC countries may grasp their objective to be between the 10 top classified states in the world by the year 2010. From the table we can also observed that UAE has shifted up around 20 places as a consequence of honest policies and regulations. Kuwait and Oman dropped in ranking during the period 2006-2009. The measure of ranking never provide a probability to precisely evaluate the reason of this, but the explanation is that these two countries Oman and Kuwaitmis placed ranks, not for the reason of not undertaken out corrections, but because other similar countries on the same index have undertaken out corrections at faster speed, accordingly overturning the places of the two states.

CURRENT ENTREPRENEURSHIP POLICIES AND REGULA-TIONS IN THE GCC COUNTRIES

The incapability of SMEs to add to gross domestic product in GCC countries is mostly referred to guite a lot of barriers like non-encouraging legal and regulatory contexts and somewhat secondary giving loans breakthrough that leads to greater collapse degree for the sector. Nevertheless, in recent years, nearly all GCC states have made considerable and substantial development in improving the overall SME atmosphere by set-up dedicated organizations, rules and programs. In addition, the financial institutions have also turn out a number of inventiveness. and products focused on SMEs. The total and entire policies and regulations controlling entrepreneurship are developed to achieve economic diversifications in GCC to overcome the dependence on oil. Given the ranks of GCC countries in 2015 in doing business report, it is clear that all countries shift up due to improved business policies and regulations. In its latest Doing Business -2015 report that examines the easiness of establishing companies in 189 countries depending on 11 regulations associated to business. The report of the last year, "Doing Business 2015: Going Beyond Efficiency," considers new information and approaches in three zones: solving bankruptcy, defending marginal investors, and receiving loans. Accordingly, previous year rankings have been realigned to the new methodology as reflected in the below table (table 2) concerning GCC countries which highlights rankings of their economies among the 189 countries. The table also shows to what extend the GCC countries have improved in ranking between 2013-2015 due to development and applications of new policies and regulations.

Country	Rank in Doing Business 2015	Rank in Doing Business 2013		
Kingdom of Saudi Arabia	49	82		
Bahrain	53	65		
Qatar	50	68		
UAE	22	31		
Kuwait	86	101		
Oman	66	70		

Table 2 Ranking of the GCC countries 2015 in Doing Business

Source: World Bank Doing Business report 2015.

Economies in the GCC region are paving the road and making it very easy for small- to medium-size enterprises to do business. Since 2004 Doing Business and entrepreneurship has been following restructuring and reforms with the objective of making business policies and regulations easier, reinforcement property rights, opening the door for right to use credit and imposing contracts by assessing their influence on ten indicator sets. Globally, nearly thousand reforms with an influence on these indicators have been determined. A lot of countries have implemented policies and actions to generate healthier regulatory atmosphere (environment). All over the world, 113 countries together with the 6 stats of GCC- applying 239 reforms which make it easier to do business between June 2007 and June 2015. Crosswise regions, the Middle East and North Africa (MENA) including the 6 stats of GCC persists its rising tendency with 27 reforms in two-thirds of the region's economies, shifting from the rank number three fastest reforming region to the second fastest reforming region. Oman enhanced and improved the effectiveness of their one-stop shops for business start-up. The procedures that used to take many days in Oman now take very few days. The second mainly fashionable reforms were in the

part of receiving credit information. Almost all GCC governments have established public funds with very easy conditions of getting loans to encourage entrepreneurship and establishment of SMEs. Administrative reforms have been taken due to the new policies which improved efficiency and transparency.

Among the GCC economies, UAE characterized as one of the economies that enhanced and improved the most in 2015. The UAE country enhanced its score on indicators that involve registering property, getting credit and protecting minority investors partly balanced by decline in scores relating to starting a business and resolving insolvency. *Registering Property:* due to the 2015 report, the UAE has made transferring property easier by initiating and set-up new service centers and a standard contract for property transactions. Getting Credit: in the UAE, reforms making it easier to get credit were carry out at the national level. A loan advancing agency was established in Abu Dabi to exchange data concerning credit and loans with Dubai Electricity and Water Authority in 2013. Due to that, the agency can classify clients who don't pay to the authority financial records for the last three months and the service has contact to the agency's bounced check repository. Defending Minority Investors: the UAE strengthened minority investor protections by beginning extra approval necessities. If the transaction of the sharing party is one-sided or creates a clash of concern, then more needs intended for reveal like such dealings to the money market and involved executives who thought accountable. It is likewise that UAE consider it conceivable for owners and investors to appeal the cancellation of incorrect associated party dealingsBy means of its display to follow modification in business policies and rules, Doing Business has taken into custody extra 2400 structural corrections to make it uncomplicated to run business from 2004. In year 2014 by the end of June one hundred twenty three countries applied as a minimum one such correction in district measured by Doing Business—two hundred thirty in all. Year by year Doing Business has confirmed a lot of reforms minimizing the difficulty and cost of regulatory procedures than reforms intensifying legal organizations. There is no difference between 2013 and 2014, with a number of 145 corrections reducing regulatory difficulty and cost and 85 intensifying legal institutions (table 3).

Table 3 Corrections and changes which ease to do business in	۱
2009-2014 years	

Field of Corrections (reform)	Amount of corrections in 2013/14	Per Year Average number of corrections for the 5 years before	Country improving in field for year 2013/14	
Difficulty and cost of control	ling procedures	S		
Initiating or beginning a business	45	45	Timor-Leste	
Issuing license of construc- tion	16	19	Croatia	
Receiving power(electric- ity)	12	12a	Solomon Is- lands	
Process of registering be- longings	21	22	Greece	
To pay duties and taxis	31	34	Romania	
Trade between nations	20	23	Myanmar	
Strength of legal institutions				
Receiving loans —lawful rights	9	10	Colombia	
Receiving loans—credit data	22	20	Jamaica	
Defending marginal inves- tors	30	14	United Arab Emirates	
Execution of contracts (agreement)	15	13	Kosovo	
Solving bankruptcy	17	10	Mozambique	

a. Refers to the average for the past 4 years.

Source: Doing Business database.

The rankings for the remaining of the GCC economies improved also during the same period that was able to increase their ranks

by many marks. Kingdom of Saudi Arabia saw the steeper increase in its rank in the GCC region standing at the 49th position as compared to 82nd position during the previous evaluation period. The most area of improvement for Saudi Arabia was related to getting electricity. These results highlight a strong propensity towards self-employment and entrepreneurial activities within GCC countries. Many jobs and opportunities are created to encourage national people in GCC to either join private sector or self-employment as entrepreneur. Table 4 appears that during the period 2000 - 2015 nearly 7 million jobs were created in the GCC countries. Out of these, almost 89% were generated in the private sector where 78% of the employment chances (opportunities) were occupied up by foreigners (non-nationals) (see table 4). To restrict the employment opportunities of non-nationals in the private sector, some GCC countries have introduced some policies and regulations to encourage nationals to join private sector as well as entrepreneur for self-employment. The GCC governments understand that if they will be able to attain full employment for their people in the private sector then the job creation has to be beyond the levels that have taken place to date. Simultaneously, the motivations to nationals in the private sector have to be increased so more nationals are attracted to it. Entrepreneurship is considered to be one manner by which nationals can become part of the private sector. So in this case encouraging policies and regulations should be designed to achieve this target.

	Job Creation		Private Sector		Public Sector	
Country	in thousands	% of to- tal GCC Value	in thou- sands	%	in thou- sands	%
Bahrain	297	4.2%	284	95.6%	14	4.7%
Bahraini	55	3.1%	42	76.4%	13	23.6%
Non Bahrainis	242	4.6%	242	100.0%	1	0.4%

Table 4 Estimates of Job creation by sector and nationality2000-2015

Kuwait	986	13.9%	680	69.0%	306	31.0%
Kuwaiti	135	7.5%	65	48.1%	69	51.1%
Non Kuwaitis	851	16.1%	615	72.3%	237	27.8%
Oman	527	7.5%	481	91.3%	46	8.7%
Omani	157	8.7%	105	66.9%	52	33.1%
Non Omanis	370	7.0%	376	101.6%	- 6	- 1.6%
Qatar	1,118	15.8%	1,078	96.4%	40	3.6%
Qatari	40	2.2%	21	52.5%	19	47.5%
Non Qataris	1078	20.4%	1057	98.1%	21	1.9%
UAE	1,546	21.9%	1,391	90.0%	155	10.0%
Emirati	110	6.1%	99	90.0%	11	10.0%
Non Emiratis	1436	27.2%	1292	90.0%	144	10.0%
Saudi Arabia	2,598	36.7%	2,344	90.2%	254	9.8%
S. Arabian	1,302	72.4%	1,068	82.0%	234	18.0%
Non Saudis	1296	24.6%	1276	98.5%	20	1.5%
Total	7,072	100.0%	6,258	88.5%	814	11.5%
Nationals	1,799	100.0%	1,401	77.9%	398	22.1%
Non Nation- als	5273	100.0%	4857	92.1%	416	7.9%

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Source: IMF (2011) data for post 2010 is estimated

Conclusion

As conclusion, GCC public sector (governments) and private sector (enterprises) can and must know how to do extra and more for innovation, especially countries like Kuwait and Oman. Cornell University *et al.* (2015) propose and recommend a number of principles and rules in order for the innovation strategy (policy) that should follow to be successful, and these principles and rules can also be applied to the GCC countries. First, the encouraging of innovation must include all the areas (sectors), not only advance or high-tech production, thus adding and including conventional (traditional) sectors such as agriculture (farming), retail, and logistics and business services. In prop of this principle, productivity enlargement through the entire sectors is more influential (powerful) than redistributing Entrepreneurship Policies and Regulations in the GCC Countries 163

the combine of sectors in the face of those with higher productivity growth. Second, invention or innovation activity should take into consideration all items of the innovation value chain. Third, states need to allow disorderly innovation, which is frequently created by new market participants, particularly those emerging in their own economies. Fourth, Information and Communications Technology (ICT), which is a commonly target technology and, more commonly, investments in new resources tools have great avails on the economy; therefore, it is important to have encouraging policies of ICT imports like keeping the price of capital goods imports low. Fifth, prop up the formation and creation of key innovation inputs policies and practices, such as digital infrastructure, skilled workforce and knowledge. Finally, it is vital to have a understandable (clear) and well-made and designed national innovation policy (strategy) and institutions to support the innovation activity (Cornell University et al., 2015, pp.90-94). The weaknesses experienced by SMEs have risen up the issue of the role of government to support SMEs and encourage entrepreneurship. The GCC countries have tended to adopt an approach that focuses on start-up programs so as to grow the number of entrepreneurs as well as SMEs. The GCC governments have mainly sought to offer early funding which has differed from country to country and a restricted level of tidied post-start up assistance. With reference to the latter the pre-start up support has a tendency to emphasis on helping entrepreneurs conduct a feasibility study and a business plan. With concern to post start up support the SME assistant institutions have delivered training courses in areas such as accounting, finance, marketing etc. Some SME support agencies have also developed government procurement programs, which need either local government or centralized government to employ a certain percentage of their projects and purchases to be prepared with registered SMEs.

Although some dissimilarity survives crosswise countries, economic diversification and growth efforts are directed toward improving the human capital of nationals and evolving high-productivity industries and services that need high-skilled labor. While there is no obvious technique for success, strategies and policies being applied appeal on international experience and contain the following:

- Increase investments in education, particularly in science and technology and professional (vocational) education
- Advance of certain sectors and activities (like, air companies and logistics in Qatar and the UAE, the SME sector in Oman and all other GCC countries, the financial industry in Bahrain and the growing petrochemicals and mining in Saudi Arabia.)
- Improving material infrastructure, and reinforcement of the strategies and policies (legal and regulatory environment) to decrease the cost of doing business.
- Supporting entrepreneurship and creativity through enhanced right to use information, communication technology, finance opportunities, and better outlay on research and development
- So as to increase the youth's preference in the face of entrepreneurship, policies and programs will need a two sides approach:
 - minimizing the pull factors to join government jobs (public sector) employment
 - endorse managerial environments that encouraging for supporting innovation and entrepreneurship
 - emphasizing push reasons for entrepreneurship concentrating on the request related with self esteem and satisfaction motives

References

- 1. Acemoglou, D., Johnson S., Robinson, J. 2001. The Colonial Origins of Comparative Development:
- an Empirical Investigation, American Economic Review, 91(5): 1369-1401.
- Bayt, 2015.Entrepreneurship in the MENA Survey, November.http:// static.wamda.com/web/uploads/resources/Bayt_Entrepreneurship_ Survey_2015.pdf
- Callen, T., Cherif, R., Hasanov, F., Hegazy, A., Khandelwal, P. 2014. Economic diversification in the GCC: past, present, and future, *IMF Staff Discussion Note,* SDN/14/12: 1-32, December.

- Chell, E. 2013. Review of skill and the entrepreneurial process, International Journal of Entrepreneurial Behaviour & Research, 19(1): 6-31.
- Cornell University, INSEAD, WIPO, 2015. The Global Innovation Index 2015: Effective Innovation Policies for Development, Fontainebleau, Ithaca, Geneva.
- 7. Hela Miniaoui and Daniele Schilir, 2016.*Innovation and Entrepreneurship for the growth and diversification of the GCC Economies*, Munich Personal RePEcArchive, Paper No. 71898,
- Hvidt, M. Economic Diversification in GCC Countries: Past Record and Future Trends. Kuwait Program on Development, Governance and Globalization in the Gulf States, London School of Economics, 2013.
- 9. KAMCO Investment Research Department, 2015, Event Update -World Bank Releases "Doing Business - 2015" Report, Kuwait.
- Kayanula D. and Quartey, P, 2000. The Policy Environment for Promoting Small and Medium-Sized Enterprises in Ghana and Malawi; Paper No 15, IDPM, Manchester
- 11. Kucera, D., Roncolato, L. 2012. Structure Matters: Sectoral Drivers of Growth and the Labor Productivity-Employment Relationship. *International Labor Office Research Paper* No. 3.
- 12. Geneva: ILO.
- 13. La Porta, R., Lopez-de-Silanes, L., Shleifer, A., Vishny, R. 1999. The quality of government, *Journal of Law, Economics and Organization*, 15(1): 222-79.
- 14. Luciani, G. Gulf Region: Economic Development and Diversification. Gerlach Press, 2012.
- 15. Luciani, G. Resources Blessed: Diversification and the Gulf Development Model. Gerlach Press, 2013.
- McIntosh, J.C. and Islam, S., 2010. Beyond the Veil: the Influence of Islam in Female Entrepreneurship in a Conservative Muslim Context. International Management Review, Vol. 6, No. 1, pp. 102-108.
- 17. MENA-OECD Investment Program, 2011, Assessing Investment Policies of Member Countries of the Gulf Cooperation Council, Assessing Investment Policies of GCC Countries: Translating economic diversification strategies into sound international investment policies. Abu Dhabi
- 18. North, D.C. 1990. *Institutions, Institutional Change and Economic Performance*, Cambridge, Cambridge University Press.

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- Schumpeter, Joseph A., 1911. The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle. 1934 translation. Cambridge, MA: Harvard University Press.
- 20. Scott Appleton, 2013. Doing Business in the GCC, Europe, Middle East and Africa (EMEA) Briefings June 2013.
- 21. United Nations Conference on Trade and Development(UNCTAD) World Investment Report 2015: Reforming International Investment Governance.
- 22. United State of America, Department of State, Investment Climate Statement, 2015. Bahrain Investment Climate Statement.
- 23. World Bank (2008a). *Doing Business 2009: Comparing regulation in 181 economies*. Washington D.C.: The International Bank for Reconstruction and Development / The World Bank.
- 24. World Bank,2008b. *Doing Business in the Arab World: Comparing regulation in 20 economies*. Washington D.C.: The International Bank for Reconstruction and Development / The World Bank.
- 25. World Bank,2015. *Doing Business: Going Beyond Efficiency, Comparing Business Regulations for Domestic Firms in 189 Economies.*, 12th edition. Washington D.C.: The International Bank for Reconstruction and Development / The World Bank.

Corporate Social Responsibility and COVID-19 Crisis

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Abstract

The cases of ongoing uncertainty of the Covid-19 pandemic have been increased all over the world. It is a necessary emergency for the people to wearing the mask, social distancing, and other issues that affect the negative impact on Covid-19 epidemic in many counties around the world. There is a lack of healthcare safety and security issues in many countries regarding protecting Covid-19 cases, lack of doctors, a lacuna of vaccine (particularly in developing and under-developing countries), and testing facilities. If the country does not solve this Covid-19 crisis, people will overwhelmingly be affected. Nevertheless, this study explores the emerging corporate social responsibility initiatives during 168 Recent Research and Innovation: An Integrated Approach

the uncertainty of the Covid-19 pandemic crisis, prudential regulation, governance and provides recommendations including new laws of Covid-19 issue. Also, this study provides how government can mitigate this problem of Covid-19 crisis through a proper strategic decision and corporate social responsibility.

Keywords: Corporate Social Responsibility, Prudential Regulation, Covid-19 Crisis

INTRODUCTION

Considering the ongoing uncertainty of the Covid-19 pandemic as worldwide public health and financial crisis, its effects on society and business are practically unimaginable. The world has been mightily attempting since the beginning of the Covid-19 pandemic (Lee, 2020). The pandemic has carried a historic public health crisis to the globe, and its adverse consequences directly extend to the worldwide economy. No specific industry is safe from this pandemic. However, corporate social responsibility (CSR) may play a significant role to diminish the episode of the Covid-19 crisis. The World Health Organization attempts to take initiatives against virus infections (WHO, 2020). Most people know that pandemic influenza comes in 1998 and then respiratory syndrome is noticed in 2002. After that, Ebola attacks in South Africa in 2013 as well. The African Ebola virus kills more than 11,300 people with losses of \$53 billion in the United States (Fernandes, 2020). However, these types of viruses devastate social and economic sectors all over the world (Gaffen, 2020; Fernandes, 2020). For example, influenza makes many infections which rate was one-third of the world population (Crosby, 2003). On the other hand, China spreads the virus across the Asian countries speedily which impacts more than 8000 people, and the death of people was 900 people (Peiris et al., 2003). Likewise, we are facing a new virus Covid-19 pandemic, which comes from Wuhan China in December 2019 and it spread very firstly worldwide (Albulescu, 2020; Ashraf, 2020; Béland et al., 2020). Recently, Covid-19 makes problems for the general people of Bangladesh for their daily life. This Covid-19 pandemic hits Bangladesh tremendously when many people die all over the world said to the world health organization (WHO). This pandemic of novel coronavirus is a curse and danger for people's life, public health, economic development, supply chain management, and a peaceful society.

According to the world health organization (WHO), the case of covid 19 was 6,218,927 where the number of death cases confirmed 372,344 among 235 countries of the world including Bangladesh till the day of 31st May 2020 (Shammi et al., 2021). In Bangladesh, the first Covid-19 positive cases were captured on 8 March 2020 and the number of positive cases was 787,726 till 21th May 2021 (WHO, 20021). The confirmed death was 12348 (WHO, 20021). However, still, no vaccine is discovered properly to remove the Covid-19 pandemic. A few countries demand that they have the Covid-19 vaccine. The Covid-19 pandemic attracts extremely to Dhaka city in Bangladesh. There are insufficient medical amenities, social distancing systems, the problem of the vaccine including jobless and other issues in Bangladesh.

In this way, no voluntary issue notices among general people regarding wearing the mask during the Covid-19 outbreak (Hossen et al., 2021). On the other hand, people who come back to Bangladesh from virus-affected areas or foreign county they are also unconscious about mask-wearing. Therefore, the world health organization emphasis on Bangladesh provides a lockdown immediately. Accordingly, the Bangladesh government decides to keep a lockdown in Bangladesh to combat the Covid-19 from March 26 to 4th April 2020 and provides some recommendations to mitigate the Covid-19 spread (Shammi et al., 2021). If this problem is continued all over the world especially in Bangladesh, it will make an overwhelmingly economical problem in Bangladesh and many people will die because of the Covid-19 outbreak. This study aims to explore the Covid-19 crisis, challenges of the Covid-19 pandemic, governance, corporate social responsibility, strategies, and prudential regulation.

CORPORATE SOCIAL RESPONSIBILITY

The Covid-19 outbreak has been battering the world economy and further putting business organizations for how their embracement of corporate social responsibility (CSR) matters during the pandemic (He and Harris, 2020). While individuals frequently perceive CSR as one fixed idea, the CSR literature has recognized the developmental idea of CSR (Carroll, 1999; Garriga and Melé, 2004). In the view of CSR from a normative viewpoint, business organizations should be socially mindful because it will become instrumental to developing firm performance and value (Jensen, 2002). The current ongoing Covid-19 pandemic may worsen the unsustainability of conventional CSR, which is carried out by numerous organizations (Manuel & Herron, 2020). The idea and general acts of CSR have been developing (Carroll, 1999) through this pandemic. Coronavirus as a serious worldwide crisis has uncovered numerous issues in our society such as climate change, racial discrimination and income inequality (Noya et al., 2020).

Considering the contemporary pattern of expanding CSR and community awareness in the corporate world, numerous social and natural issues (Rahman et al., 2021) will be examined and likely become incorporated into business tasks in the long run, become more expected standards as a component of the business model. It will be fascinating and crucial to perceive such development so that business objectives can adjust to these developments in an ideal way. Fombrun et al. (2000) stated that the part of CSR as protection like insurance, which may give some adaptability to a business organization during the ongoing Covid-19 pandemic. Due to the company's CSR involvement, the clients may more eagerly buy the company's product during the emergency, or customers may believe the business organization because of its socially responsible image (Bae et al., 2021). Accordingly, we may consider how a business organization's CSR strategy can speed up its recovery during and after the pandemic. The mismanagement and poor development of CSR strategy of business firms can hurt the company during the pandemic. Lee (2020) indicated that a company's investment in CSR deteriorates the negative effect of the Covid-19 epidemic on its performance because CSR investment is not an ideal method to increase the value of a business organization.

Corporate social responsibility is considered as responsible corporate behaviour although there is no specific definition of that corporate social responsibility. It is also considered a voluntary commitment to certain company rules. In a nutshell, it mentions the moral and ethical obligations of employees, their competitors, the environment, the economy, and many other areas of life that its business affects (Gond et al., 2011). This corporate social responsibility term is used to improve the company's effort in society in some ways. These efforts can include donating money to nonprofits as well as develop environmental policies in the workplace. However, corporate social responsibility is a broad concept and a type of international private business self-regulation which depends on industry and company (Gond et al., 2011). It is very important for both companies and consumers. CSR aims to contribute social of a philanthropic, activist, or charitable nature by supporting ethically oriented practices (Carroll, 2021). CSR is a direction how companies control and measure their impact on society.

It contains the company's contributions with both positive and negative sides on the economy, environment, and greater community (Kang et al., 2010). Corporate social responsibility can make beneficial to a company in two ways. The first benefit is related to increase the companies brand image because any clients or consumers see the evidence of social responsibility where they respond positively. The second benefit is involved with the employee's morale. On the contrary, this social responsibility is related to the management concept where companies join in social and environmental concerns in their business operations and a company achieves a balance of social, environmental, and economic imperatives (Blackburn, 2012). In this way, corporate social responsibility is a company's commitment to managing the social, environmental, and economic effects of its operations. Nevertheless, corporate social responsibility activities include invests profits in health and safety, environmental programs,

environmental management, waste reduction, and sustainability (Montiel, 2008). There are many benefits of corporate social responsibility. First of all, companies establish good reputations, positive attention, save money through operational efficiency, and minimize environmental impacts. Public companies often report on their CSR performance in their annual reports. If social responsibility is not approved by the company, they may lose their customer reputation. It is seen many times in social media and activist groups, some companies do not maintain their duties when they are going to do their social and environmental responsibilities.

In Canada, mining companies often work with indigenous groups and communities (Dashwood, H. S. 2007). By mining, it causes environmental impacts on aboriginal people who are living in the mining area. That is why some of the Canadian mining companies work in corporate social responsibility with local communities so that adverse effects of mining can be minimized by ensuring safety (Dashwood, 2007). We think that corporate social responsibility increases the company's reputation because it is related to environmental and social issues. By making CSR strategies, companies develop their business. For example, they increase their social consciousness by reducing waste, minimizing carbon footprint, recycling, and other best practices. Using or producing sustainable products, companies gain their reputation among environmentally concerned clients. In social issues, they help and donate to the poor people who are affected by the Covid-19 pandemic.

CHALLENGES OF COVID-19 PANDEMIC

Primarily, Bangladesh could not take any proper steps to control the mass gathering of the general people of Bangladesh during the Covid-19 pandemic (Anwar et al., 2020). Therefore, a plethora of people goes outside for their work specially in Dhaka city (the capital city of Bangladesh). In Bangladesh, around 46 thousand people live per square kilometre. Consequently, people fall into the dilemma while they are walking on the road and in other areas. For the social distancing problem, it is recommended by the WHO organization for reducing the infection from virus and order to stay at home. It is said that social distancing has become an overwhelming difficulty to control in Bangladesh. Nevertheless, this social distancing is still a challenger in Bangladesh. During this pandemic, the number of Covid-19 cases increases because of the lacuna of awareness and proper information. (Haque and Rahman, 2020). For reducing the infection of Covid-19, the physical distance or social distance of people should keep at least one meter from others. Besides, the government of Bangladesh closes the many educational institutions and cancels most of the events like political events, sporting activities, shows, and commercial activities. Because that social distancing reduces the risk of infection.

The definition of social distancing is given by the various government and private, but the world health organization says to stay at least 1 meter from crowds and public places (Islam & Hossain, 2021). On the contrary, the Australian Government Department of Health, Public Health England, and Public Health Agency of Canada said that one of the most crucial strategies is to keep social distance at least six meters. The Covid-19 is tested in Bangladesh for 7,812 samples per million people when Russia tests 212,414 samples (Islam et al., 2020). In this way, it is believed that most of the persons having covid-19 were cleared out undetected due to the lower number of tests. However, the percentage of Covid-19 has been increased in Bangladesh. There is an available facility for testing services of the Covid-19 pandemic in many countries, but unfortunately, these facilities are noticed in 30 districts out of 64 districts of Bangladesh (Rahaman et al., 2020a).

In most of the districts in Bangladesh, there are no Covid-19 testing service facilities/amenities in Rangamati, Bandabbbrban, Khagrachari, but Covid-19 has been increased in these areas (Rahaman et al., 2020b). Most of the countries are identified that Bangladesh as a dangerous zone because of the spread of the Covid-19 pandemic. A vast number of physicians of private clinics in Bangladesh do not interested to check the Covid-19 patients (Andrade, 2020). The general people of Bangladesh do not aware

of the infection of Covid-19 pandemic, thus, Covid-19 spreads among the people. Despite the world health organization's direction, Bangladeshi people do not care regarding Covid-19 issues.

Many physicians are not willingly interested to check the covid 19 patients and many hospitals and clinics hidden the number of Covid-19 patients. Healthcare organizations should give accurate information about the Covid-19 cases so that the percentage of positive cases can be known to general people. The government of Bangladesh is taking the initiative to reduce the Covid-19 cases. If the test is not finished on the whole country; it will create a red zone all over Bangladesh and bring massive suffering. There is another problem with mental health in Bangladesh. The fear of the Covid-19 pandemic leads to an increase in the mental health of the general people (Torales et al., 2020). When people receive any news of the Covid-19 pandemic from social media (e.g. WhatsApp, Instagram, Facebook, television, print media, political leaders and social workers, religious), they feel the tension which leads to increase mental health (Islam and Hossain, 2021). Social media especially Facebook spreads this information broadly to the general people through messenger chatting. For solving those problems, the imam of the mosque, and social media can provide basic knowledge and consciousness among the general people.

The general people of Bangladesh believe that the political leaders are trying to use more vaccines for business purposes. Another crisis is related to people job satisfaction. Many people lose their job during the Covid-19 pandemic as reported by the World Bank (Lippens et al., 2021). Therefore, jobless people are in a horrible situation in Bangladesh and fail to carry their livelihoods. A report mentions that approximately 76% of people lose their job in Dhaka when 59% in local or village areas (Habib, 2020). It is said that jobless people will be unable to join again in their previous job in Bangladesh (Habib, 2020). Therefore, lower-income people are enduring due to the Covid-19 issue.

According to the vaccine issue, many countries worldwide like England and Russia demand that they discover vaccines to tackle the Covid-9 crisis (Shin et al., 2020). However, this vaccine applies to some countries to save a life from enduring Covid-19 pandemics but there is no step in Bangladesh to apply that actual vaccine. Although the government starts to apply the Oxford-Astra Zeneca Covid-19 vaccine, it does not work to fight the coronavirus. The latest population of the world is around 7.8 billion but need more than 15 billion vaccine injections to overcome this Covid-19 crisis (Friedman, 2020). The expertise of the USA reported that only seven percent can cover the problem of Covid-19 by using the vaccine. However, it is challenging for Bangladesh to provide the vaccine to all people as a developing country. The Bangladesh government becomes unable to supply the injection or vaccine to the general people during this pandemic situation. For mitigating the problem, the government can make diplomatic relations with foreign countries. For example, Russia and China apply their vaccine in their countries but our media does not focus on news regarding the vaccine issue. Nevertheless, Bangladesh can take help from those countries for getting the vaccine if the Bangladeshi government feels this crisis.

GOVERNANCE

In beginning with Bangladesh, all private and government workplaces are closed for 10 days except shops of essential commodity grocery shops, hospitals, restaurants, pharmacies, such as fresh foods produce markets, industries, retail banks in a limited capacity, and other emergency services (Islam and Hossain, 2021). This lockdown aims to make social distancing and protect the people from Covid-19 and spreading infection with each other. According to those guidelines of the government, no one even a foreigner will go outside except in special cases. Nevertheless, if anyone goes outside, they should wear gloves and a mask too. The rule of foreigners who have recently come to Bangladesh must stay in guarantine for at least 14 days (Ahsan et al., 2020). However, according to government direction, public transport should be avoided as much possible as. Furthermore, various programs like religious assemblies, political and gatherings are imposed on banning. Moreover, no one can go to their village

home. But unfortunately, after three days, hundreds of videos are noticed on social media that people are violating the government rules even they are vising their village home during the lockdown. Consequently, it impacts on government's order and rules.

PRUDENTIAL REGULATION

In Bangladesh, if anyone violates the lockdown from the government and non-government, or an executive magistrate can take action under Mobile Courts Act, 2009 (The Mobile Court Act, 2009). Then, a fine can be imposed under section-269 of the penal code, 1860 (The Bangladesh Penal Code, 1860). Section 269 of the penal code 1860 said that it is an official rule that if people neglect it in a manner by spreading infection among the people which is very dangerous for the human body and their life. According to that section, punishment will be held for a term that can be six months although there is no specific amount. However, section 63 said about the amount of fine, but it will not be extreme. Nevertheless, mobile courts can punish for six months including one thousand takas (Bangladeshi currency) as a punishment under section 188 of that penal code for disobedience of the government's order (The Bangladesh Penal Code, 1860). Against that mobile court's order, people can appeal to the district court when they face a penalty by the executive magistrate. If a person violates any rule or order of government by helping and spreading the infection to the people even provide false news about the Covid-19 pandemic, they will be protected under various provisions of infectious diseases (prevention, Control and Eradication) Act, 2018) (Protirodh, Niontron O Nirmul Ain, 2018), Act No. 61 of 2017). In this way, the government can take steps by choosing a procedure under the penal code of Bangladesh to maintain the mobile court that violates the criminal justice system. However, the law enforces agencies and the police are responsible for ensuring the law and government's order.

STRATEGIES

We have suggested some strategies for reducing the pandemic, particularly in Bangladesh. The government of Bangladesh and
civil administration, police, army and other law enforcement agencies will apply the new law unless the public follows the direction of social distancing of the Covid-19 pandemic. The social distancing should be maintained by the people and they will wear gloves and masks. The government's health authorities should provide recommendations for wearing masks and handwashing compulsory in a public place. Furthermore, people will remain at least 6 feet distance from each other. Public awareness should be increased for applying policies of the government. People should refrain from educational institutions, public events, overpopulated areas, any public assembly, cultural program, open birth celebration or marriage party, and take appropriate prevention in place orders. The individual should stay at least 1 meter far away from other people or crowds. The government will take legitimate measures to handle this social distancing problem. That is why the government can pass a new law by alleviating the present Covid-19 crisis.

The number of tests for Covid-19 cases should be increased so that the percentage of Covid-19 outbreaks can be reduced. Russia and the USA have increased the testing services facility in their hospitals. Doctors will be liable for their work unless they provide their services to patients during their duties. The law should be passed regarding that no doctors will neglect any Covid-19 affected patients. The report should be given within 3 hours or in a day so that no person is affected by the Covid-19 pandemic. The testing systems of Covid-19 in every district should be increased for reducing the outbreak of a pandemic. The mental stress can be removed by encouraging people that no Covid-19 is affected on their bodies if they maintain consciousness, cleanliness, healthcare safety and security.

For getting the vaccine, the government should make diplomatic relations with foreign countries. Due to the Coivd-19 pandemic, many people lose their job. The government should provide the job who lose their occupation during the Covid-19 pandemic. It can be held by making new laws or policies. In Bangladesh, it is needed an emergency law so that economic and health problems can be mitigated easily. We can follow the United States because

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they make a new law to tackle the Covid-19 issues. The name of that act is The Coronavirus Act 2020 which contains the government's power for executing some emergency and radical measures. Thus, the UK Covid-19 law restricts the spread of infection among people. The Bangladesh government can also follow the UK's law for enacting a new law. So, the government of Bangladesh will be enabled to provide proper guidelines by making new laws regarding Covid-19 issues. The Bangladeshi government can return the job to the jobless people by sanctioning a new law. The government will take a fundamental step and make a new law for social distancing. The act may be exclusively for two years and it can be reviewed every six months. The government will restrict food supply that no one will increase the price of food, particularly raw materials. If anyone does, he will be punished by the new law of Covid-19. All institutions like schools, colleges, universities, private organizations, public divisions, including others will be operated virtually without a physical presence, although the Bangladesh government has already taken steps in every institution. Thus, the Bangladesh government can make a modern law for solving the above difficulties.

Conclusions

This study highlights the business organizations' CSR involvement concerning the Covid-19 epidemic and economic crisis around the world. The global impact of the ongoing uncertainty of the Covid-19 pandemic is a health and economic crisis. There are several limitations in a lower-middle-income country regarding health crisis due to the Covid-19 pandemic. However, for solving this problem, the government can take initiative for a lockdown strategy, particularly for social distancing. Many countries around the world such as the USA, UK, Malaysia, and Singapore have already given a lockdown. The companies' CSR activity during the Covid-19 pandemic can help to solve the job issues and vaccine problems. It is difficult for the government to tackle this problem. International cooperation and individual efforts within the country is required to solve the Covid-19 crisis. The government of any poor and developing country cannot illuminate this issue alone.

The government should take initiative for a long-term plan for reducing the Covid-19 crisis. The emerging CSR initiative throughout the Covid-19 pandemic, financial implication of CSR during Covid-19, and the role of CSR activities during the pandemic can play a significant role in developing the business organizations.

References

- 1. Ahsan, A., Archie, R. J., & Tidwell, J. B. (2020). Combating COVID-19 in Bangladesh: ideal duration of mandatory quarantine period and policy implications. *Infectious Diseases: Research and Treatment*, 13, 1-17.
- Anwar, S., Nasrullah, M., & Hosen, M. J. (2020). COVID-19 and Bangladesh: Challenges and how to address them. *Frontiers in public health*, 8 (154), 1-14.
- Andrade, R. M. D. (2020). A company doctor's role during the COVID-19 pandemic. Available at:http://www.scielo.br/scielo.php?script=sci_ arttext&pid=S180759322020000100105 (Accessed: the 23rd April 2021).
- 4. Albulescu, C. (2020). *Coronavirus and Oil Price Crash*. hal-02507184v2f. Available at: https://hal.archives-ouvertes.fr/hal-02507184/ document (Accessed: the 12th April 2021).
- Bae, K. H., El Ghoul, S., Gong, Z. J., & Guedhami, O. (2021). Does CSR matter in times of crisis? Evidence from the COVID-19 pandemic. *Journal of Corporate Finance*, 67, 1-15.
- 6. Blackburn, W. R. (2012). *The sustainability handbook: The complete management guide to achieving social, economic and environmental responsibility.* Routledge.
- 7. Carroll, A. B. (1999). Corporate social responsibility: evolution of a definitional construct. *Business and Society*, 38(3), 268–295.
- 8. Garriga, E. and Mele, D. (2004). Corporate social responsibility theories: mapping the territory. *Journal of Business Ethics*, 53, 51–71.
- 9. Crosby, A. W. (2003). *America's Forgotten Pandemic: The Influenza of 1918.* Cambridge: Cambridge University Press, UK.
- Carroll, A. B. (2021). Corporate Social Responsibility: Perspectives on the CSR Construct's Development and Future. *Business & Society*, 00076503211001765.
- 11. Dashwood, H. S. (2007). Canadian mining companies and corporate social responsibility: weighing the impact of global norms. *Canadian Journal of Political Science/Revue canadienne de science politique*, 129-156.

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- Friedman, D. (2020, 12 4). Vaccine still a challenge for Bangladesh, many others. Available at: https://thefinancialexpress.com.bd/ health/vaccine-still-a-challenge-for-bangladeshmany-others-says-drfriedman-1607078183 (Accessed: the 12th April 2021).
- 13. Fombrun, C. J., Gardberg, N. A., and Barnett, M. L. (2000). Opportunity platforms and safety nets: corporate citizenship and reputational risk. *Business and Society Review*, 105(1), 85–106.
- Fernandes, N. (2020). Economic Effects of Coronavirus Outbreak (COVID-19) on the World Economy. Available SSRN 3557504. Available at: https://foroparalapazenelmediterraneo.es/wp-content/ uploads/2020/03/SSRN-id3557504.pdf.pdf (Accessed: the 17th May 2021).
- 15. Gladstone, R. (2020). *Oil Collapse and Covid-19 Create Toxic Geopolitical Stew.* New York, NY: The New York Times.
- 16. Gaffen, D. (2020). *What the Future May Hold for Oil Amidst COVID-19*, Cologny: World Economic Forum, Vol. 26.
- 17. Gond, J. P., Kang, N., & Moon, J. (2011). The government of self-regulation: On the comparative dynamics of corporate social responsibility. *Economy and society*, *40*(4), 640-671.
- He, H. and Harris L. (2020). The impact of COVID-19 pandemic on corporate social responsibility and marketing philosophy. *Journal of Business Research* 116, 176–182.
- 19. Haque, S. E., & Rahman, M. (2020). Association between temperature, humidity, and COVID-19 outbreaks in Bangladesh. *Environmental science & policy*, *114*, 253-255.
- Habib, R. K. (2020, 28 9) Covid-19 fallout: 68% lost jobs in Dhaka and Ctg, Available at: The Daily Stra: https://www.thedailystar.net/frontpage/news/68pc-lost-jobs-dhakaand-ctg-1968641, (Accessed: the 20th May 2021).
- Hossen, M., Obaidullah, M., & Hosen, M. (2021). Public Awareness during COVID-19: A Study on Barishal Division, Bangladesh. *Electronic Research Journal of Social Sciences and Humanities*, 3, 31-42.
- 22. Islam, M., & Hossain, M. M. (2021). The Challenges of Covid 19 in Bangladesh: Need an Emergency Law. *International Journal of Law Management& Humanities*, 4(1), 124–137.
- Islam, M. T., Talukder, A. K., Siddiqui, M. N., & Islam, T. (2020a). Tackling the COVID-19 pandemic: The Bangladesh perspective. *Journal* of public health research, 9(4), 1-19.
- Jensen, M. C. (2002). Value maximization, stakeholder theory, and the corporate objective function. *Business Ethics Quarterly*, 12(2), 235– 256

- 25. Lippens, L., Moens, E., Sterkens, P., Weytjens, J., & Baert, S. (2021). How do employees think the COVID-19 crisis will affect their careers?. *Plos One*, *16*(5), 1-13.
- 26. Lee, S. (2020). Corporate social responsibility and COVID-19: Research implications. *Tourism Economics*, 20(3), 1-7.
- Montiel, I. (2008). Corporate social responsibility and corporate sustainability: Separate pasts, common futures. Organization & Environment, 21(3), 245-269.
- Manuel, T., & Herron, T. L. (2020). An ethical perspective of business CSR and the COVID-19 pandemic. *Society and Business Review*, 15(3), 235-253.
- Noya, A., Bulakovskiy, M. and Rijpens, J. (2020). Social economy and the COVID-19 crisis: current and future roles. Organisation for Economic Co-operation and Development. Available at: https://read. oecd-ilibrary. org/view/?ref¼135_135367-031kjiq7v4&title¼Socialeconomy-and-the-COVID-19-crisis-current-andfuture-roles (Accessed: the 23th April 2021).
- Peiris, J. S. M., Yuen, K. Y., Osterhaus, A. D. M. E., and Stöhr, K. (2003). The severe acute respiratory syndrome. *N. Engl. J. Med.* 349, 2431– 2441.
- Rahaman, K. R., Mahmud, M., & Mallick, B. (2020b). Challenges of Testing COVID-19 Cases in Bangladesh. *International Journal of Environmental Research and Public Health*, 17(18), 1-15.
- Rahman, M. K., Masud, M. M., Akhtar, R., & Hossain, M. M. (2021). Impact of community participation on sustainable development of marine protected areas: Assessment of ecotourism development. *International Journal of Tourism Research*, https://doi. org/10.1002/jtr.2480.
- Shammi, M., Bodrud-Doza, M., Islam, A. R. M. T., & Rahman, M. M. (2021). Strategic assessment of COVID-19 pandemic in Bangladesh: comparative lockdown scenario analysis, public perception, and management for sustainability. *Environment, Development and Sustainability*, 23(4), 6148-6191.
- Shin, M. D., Shukla, S., Chung, Y. H., Beiss, V., Chan, S. K., Ortega-Rivera, O. A., ... & Steinmetz, N. F. (2020). COVID-19 vaccine development and a potential nanomaterial path forward. *Nature nanotechnology*, 15(8), 646-655.
- Torales, J., O'Higgins, M., Castaldelli-Maia, J. M., & Ventriglio, A. (2020). The outbreak of COVID-19 coronavirus and its impact on global mental health. *International Journal of Social Psychiatry*, 66(4), 317-320.

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- WHO (2020). Immunization in the Context of COVID-19 Pandemic. Available at: https://www.who.int/publications-detail/ immunization-in-the-context-of-covid-19-pandemic (Accessed: the 12th May 2021).
- 37. WHO (2021). Global Bangladesh. Available at: https://covid19.who. int/region/searo/country/bd (Accessed: the 24th April 2021).

Impact of Deception on Consumer Behaviour in E-Commerce Industry with Respect to Fashion and Apparel

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Abstract

This study investigates the theme of deception in the e-commerce sector with respect to studying the consumer behaviour towards said deception. The paper uses fashion and apparels as a vehicle to explore the matter. Deception can be easily disguised as sales or 'cut-prices' on the internet and customers can be pressured or manipulated into buying products because of relativity cue pricing and various other techniques, before gathering the full information about them. This paper highlights various techniques that e-commerce sites use for deceiving consumers concerning dark web patterns. It also investigates the impact of this deception on consumer behaviour while shopping online consumer get impacted by either the pictures or the extensive and lucrative discounts offered. A person can easily be led on to buy clothes online as they do not have the luxury to see it and compare its quality among other factors until they have bought it. It shows how modern-day technology which is invented for the betterment of society is used by few people to mislead and device the consumers. The paper also affirms that these practices are against the law and disrupt consumer claims from deception in advertising and marketing to deception being undertaken in high-end brands in the e-commerce industry of F&A. The paper also concludes with the implications of marketing managers respectively.

WHY WE HAVE TAKEN THIS TOPIC?

Amidst the advent of e-commerce, the potential of modish internet technologies to mislead or deceive consumers has risen considerably.

This could be taken or expected to erudite the gap that in turn would be a stumbling bar for customers. A well-read purchasing decision necessitates added extra than just steering scale of a price tag. Customers also necessitate knowing the prices of other items, the prices in additional stores and what values sway in the infinity. The simple candid of the pricing cues retailers practice is the sale symbol. It ordinarily resembles somewhere near the discounted item, trumpeting a bargain for customers. The expression "sale" alongside a price can raise demand by more than 50%. Setting a sale badge on an article costs the retailer implicitly zero, and repositories generally do not perpetrate to a particular level of discount when practising the signs. It presumes that the repository often exaggerated its discounts by inflating its usual prices. The legislation forbids online principles from practising deceptive user interfaces, known as "dark patterns" to deceive customers into delivering over their data.

The term "dark patterns" is employed to display the online interfaces in websites and apps devised to deliberately manage

users into taking procedures they would contrarily not take under normal circumstances. The following tactics are designed in a manner to draw the attention of consumer's behavioural psychology research which is rigorously practised on social media platforms that are misleading in essence and turns out advantageous to the company.

Deceptive pricing could be a process within which traders use deceptive means like "original", "former", or "regular" pricing quotes for the preponderance of a term to mislead shoves and customers into thinking that they're expending less money for products. The Federal Trade Commission outlaws corporations from practising such deceptive practices towards consumers. Now, when business competition is high, brands resort to varying methods to draw in the eye of consumers. This encompasses various methods of promoting or pricing practices to drive the interest of as many groups as possible and thus increase revenue. Numerous of those practices are against the law and disrupt consumer claims. Such practices could also be governed by implementation action so it's decisive to endure in consideration and avoid them. We'll consider the foremost popular practices to circumvent when acquiring products from diverse brands.

FORMER PRICE COMPARISON

In this illustration, a retailer donates a bargain on specific items by notifying customers that its payment is not up to a preceding one. The corporate warrants that the merchandise is "discounted" by installing the inflated former price to designate the distinction.

PRESSURE SELLING

Businesses use the subconscious know-how to emotionally manipulate the consumers through limited-time offers, and long soliloquies from sales diplomats to make people buy products. It helps generate more sales and raise revenue. However, these manipulative measures are illegal and violate customers' rights.

STRIKETHROUGH PRICING

Cross-out or strikethrough values continue performed within

the technique of pricing comparison to draw in the eye of consumers. Saving is formed as juxtaposed to the manufacturer's recommended retail price. Companies use strikethrough pricing to gain more customers considering they perceive a tangible modification in price.

There are many sorts of pricing practices that mislead customers into thinking that they obtain items for a lower cost. We've mentioned the leading popular in existence. Through our paper, we'd address the deceptive measures taken up by high-end fashion brands concerning product and pricing and also learn the ways to fight these deceptive actions.

DECEPTION

Marketing is the most important activity of an organization where its enforcement can critically influence the success of the business. The principal object of publicizing advertisements is to persuade dormant customers to purchase or consume a commodity or a service (Virdi, I, 2017). Thus, advertisement plays a vital role in forming consumer behaviour. The advertisements can also be used as a mechanism of deception which can deceive the inherent consumers to react negatively to advance advertising. A deceptive advertisement is harmful and rebuked as unethical and harmful to the consumers. Freer, 1949, guoted in his research that "A difference between a good and bad advertisement is that a good one not only tells the literal truth but possibly avoids omission that may lead to deception". Deceptive advertisements can affect the consumers to generalize the promoters for all classifications of products and services offered or are available in diverse geographic regions because deceptive advertising weakens the effectiveness of consequent marketing information, like when the displayed product appears to provide strong benefits or carries a well-known brand. The negative consequences of the deceptive ad are also comparatively long-lasting in the sense that they are observed for supplementary advertisements confronted 24 hours after the original deception. In marketing report, only a few scholars have tried to define hypocrisy in advertising (Aaker, David, & A., 1974), and they too have not been able to reveal a well-accepted interpretation. Deception can be through different ways: price deception, product deception, advertising deception, quality deception, etc. From all of the various ways, deceptive advertising is the most frequently used method of deceiving the consumers. Thus an advertisement is deceptive if it affects a notable percentage of latent consumers (i.e., those at whom the advertisements directed or whose consumption behaviour is likely to be controlled by it) to possess false beliefs regarding the product.

CONSUMER BEHAVIOUR

Consumers have a balanced response to advertising which indeed concentrates on a logical listing of all the functional aspects of the offering. When customers estimate interests, they become emotionally entangled with advertising and advertisement. Consumers recognize different ways through which the product or service can make them happier, enrich their lives or give them satisfaction.

Consumer behaviour is the study of individuals on how they purchase, utilize and select a product or a service. Its main concern is to know the psychology, motivation and behaviour of consumers. According to Engel, Blackwell, and Mansard, "consumer behaviour is the actions and decision processes of people who purchase goods and services for personal consumption." The provision of consumer behaviour concerns the consumers as performers of the marketplace where consumers execute multiple positions in the marketplace from furnishing information, from users to players and the disposer, purchasers conclusively play the requisite role in the decisionmaking process.

In the Words of Gorn, 1982, the consumer behaviour towards a product is auxiliary on the advertisements externally any estimate of the commodity is based on the essence, characteristics and relevant factors. Most advertisements are paid in nature to publicize the products offering more attractive advertisements and by holding an advantage on their competitors where numerous companies converge on gaining funds not on preserving dependable customers but by offering them value products. Consumer behaviour will depend upon the product performance and perceived brand image if the company is offering that product that adding value to the product in comparison with their other competitors or available substitute product.

The critic states several subjects for reference variation in customer preferences compared to the product, their buying benefaction and incorporation of objects. The frequent advertisements will affect consumer behaviour that is irrational in nature thus leads to a sudden urge to devise a decision.

IMPACT OF DECEPTION ON CONSUMER BEHAVIOUR

Consider the following examples: An advertisement for a dress displays a well-known brand of the clothing industry, but when the dress is ordered, it is a replica of the brand on inferior fabric. A consumer examines an advertisement online for a discount offer on a brand yet, when the shipment reaches, the consumer affirms that the advertisement neglected to specify that the clothes were refurbished. A label claims that its products are well suited with a lot of options. But consumers who consult the brand observe that the merchandise is a base prototype with only fundamental peculiarities. These are some examples of deceptive advertisements (Virdi, I, 2020).

Advertising deception makes consumers defensive and skeptical of future advertising claims. Deception in advertising not only challenges the authenticity of the ads as a whole but makes consumers defensive towards his/her purchase in the future. It also makes consumers more protective as to make any future purchase from the advertisers who are involved in making the deceptive statements. (Darke and Ritchie, 2007)

It is worth mentioning that Consumers do not need to know the exact place/thing/material/process through which they are deceived. They simply perceive it with the discrepancy in the impression that the product creates through advertisement and promotion with the actual performance and reliability of the product or the service being offered to them.

Advertisers who do not misrepresent their customers, always

appreciate market heritage more than those who overstate them. Marketing should be focused on the level of contentious services to produce positive consumer preference and attitude towards the advertised product or service. More prominent levels of sophisticated disinformation were correlated with the lesser level of perceived credibility, less pleasing behaviours, less envying attitude towards the brand, and lowered purchasing ratio towards the product.

If a consumer faces after purchase dissonance then this will create a great risk of negative effect on the consumer's repurchase decisions and will act as a major element for the visible and non-visible negative behaviour of the consumer which ultimately harms the brand's image. (Wilkins, Beckenuyte and Butt, 2016)

It is much easier to display something better than it is through deception. Nevertheless, a corporation necessitates to have advertising ordinances and keep impressions in mind concerning their advertisements. A deceptive advertisement can head to a negative brand image, it would be better to stay accurate and advertise the product with sincerity and integrity. This will yield benefits in many ways, including a positive brand image. The advertiser should be certain of the impression. The advertiser should be certain that the impression created by the advertisement is not false. There should be no deceptive pricing, make convinced that your proposition is honest, Otherwise, All purchasers have the right to claim advertisers under the consumer protection law.

FASHION AND APPARELS

The fashion and apparel (F&A) industry are one of the greatest economies donating 38% to the Asia Pacific, 26%. F&A is also one of the most comprehensive exhaustion generators globally because of predicaments like excess and product returns. The principal reason back this is the consumer's restlessness with the products offered by the manufacturer in the duration of size, colour, and style. Hence, the enterprise needs to enhance customer-centric for fortunately commanding environmentfriendly manufacturing practices.

A supplementary impact of digitalization is noticed in consumer behaviour in the F&A industry. The F&A enterprise is one of the most influential enterprises with new data being generated each time a new garment is originated, assembled and contracted.

DECEPTION IN F&A

The scope of this study is to discuss the price related deception mainly occurring online within the fashion and apparel industry. To understand deception in the Fashion and Apparel Industry, we must identify the types of goods and services present in the specific industry. Based on search attributes and information available with the consumer, we broadly divide the goods into three types-

- 1. Search Goods: We describe Search Goods as the ones whose quality can be determined by the consumer before purchase. With search goods, you can assess the value before purchase.
- Experience Goods: Experience goods are the ones whose characteristics cannot be determined before the purchase. One must experience the good or service before evaluating how it matches your requirements and whether the price of the good or service complemented the perceived value.
- 3. **Credence Goods:** the goods whose quality is difficult to evaluate before or after purchase and use. Many luxury goods or high-end fashion products fall in this category. In the case of credence goods, the consumer doesn't know whether the promise while purchase has been fulfilled or not. Generally, the consumer who uses the product is different from the consumer who determines the quality and price of the product.

With Search Goods, the retailer is competing on price as compared to offered attributes. For Experience Goods, the seller must convince the buyer that the product or service is needed and worth the cost. Credence goods and services depend upon the status of the person and indicate superior quality by having a higher price.

Nelson (1970) asserts that the amount of information in advertising varies directly with consumers' ability to verify advertising claims at a reasonable cost before purchase. If consumers can assess the truth of the claim before purchasing "search" activities, advertisers' motive to lie about the quality of their goods is reduced substantially. If on the other hand, consumers cannot accurately ascertain the accuracy of claims before purchase or perceive that the cost of before purchase scrutiny exceeds its expected value, manufacturers have a greater incentive to disassemble and consumers have less reason to believe the advertising. The consumer has a simple substitute to search; he can use experience, that is, he can conclude about the quality of brands by purchasing and using them. But in the case of Credence Goods which make up a lot of share in High-end Fashion, Identifying deception is a tedious task. Credence Goods provides a lot of opportunities for marketers to deceive consumers by counterfeiting. On the other hand, In the case of Fast Fashion Goods which mostly covers the search and experience activities, the consumer becomes aware of the price deception or product deception before or before the purchase.

IMPACT OF DECEPTION ON E-COMMERCE INDUSTRY

As per the World Trade Organization, "Electronic commerce, or e-commerce, is defined as the "production, merchandising, retailing, sale or transportation of goods and services by photoelectric means". An ecommerce trade can be between enterprises, families, selves, governments and other public or private organizations

With the arrival of e-commerce, the inherent use of internet technologies to lure users has risen considerably. This research extends the prior methods of deception and presents the typology of price-related deception in the e-commerce industry that shows various ways in which online sellers can deceive consumers via e-commerce platforms through multiple/ false pricing of products. This typology can be used to promote consumer awareness of various price-related deception schemes used by online merchants.

The Internet is a digital space with low or almost no entry barriers implying that anybody can enter this free space and make use of it. This unique and sometimes harmful feature of the Internet creates a fertile ground for deception.

"For product-related erudition implemented at an e-commerce website, content can be screened, prevaricated, and/or misrepresented by online companies. For instance, an online company can withhold negative information (e.g., a known safety problem) about a product (i.e., concealment); provide vague information about the total cost (e.g., selling price, tax, shipping and handling fee) of a product (i.e., equivocation); give ambiguous information concerning product return and refund policies (i.e., equivocation); automatically filter out negative consumer reviews (i.e., *concealment*); pose as consumers to write positive reviews about products and services received from the company (i.e., falsification); or even sell a non-existent product (i.e., falsification). In sum, by reconstructing the availability and status of erudition, online corporations can manage the content of product information at an e-commerce website to intensify consumers' evaluation of those appropriate merchandises."(Xiao and Benbasat, 2011)

IMPLICATIONS FOR MARKETING MANAGERS

Marketing supervisors control all of the interfaces between a corporation and its consumers. From managing internal teams, their work ranges to crafting promotional advice. They work with numerous distinct sorts of evidence, from conventional newspapers and signboards to digital advertising and social policies. A marketing manager is accountable for the promotion and positioning of a brand and the goods and services that the firm trades. By and large marketing managers are appointed to attract more people to buy from the company and to raise brand awareness through innovative marketing campaigns.

The retailing supervisor performs the function of championing patron relationship command in the organization. The marketing handler collects this erudition from the organization's patron database to help shape a customer comfort survey. Marketing managers then share this erudition with other representatives to warrant they offer exceptional patron service to their clients to develop lasting bonds

Marketing administrators dissect market bearings to distinguish unexploited or new markets for the organization's products and services. By analyzing the purchasing patterns of consumers, they can ascertain the peak and off-peak demand periods for their products. By manipulating sales forecasting, they can predict the future display of the organization's outcomes. Also through fair commentary and forecasting, they can develop artifices to ensure the organization endures.

With all the perks and positives that the marketing managers do for their organization sometimes to gain exceptional profits or earn unearned gains the marketer may manipulate the quality of the product, the promotion methods used, pricing of the product, all of which is an attempt to deceive the consumer and generate unreasonable, high profits which may lead to short term gains but ultimately leads to financial loss to the marketer with losing its competitive position in the market in the long run, as well as in the short run.

Nowadays Ambiguous retailing is disputable stuff. The marketers avoid allowing on whether an appropriate arrangement is deceitful or not. Though, it is believed that more or less every service provider is somehow engaged in misleading claims and exaggerations which are deceptions; while campaigning and promoting the products and services. Furthermore, it is worth mentioning that the merchants, who do not mislead their clients, always own market heritage more than those who emphasize. Thus, it is always advised to advertising companies not to concentrate on misleading applications with unreliable translations. As a consequence, marketing and billing controllers need to carry on with prudence when building environmentally absorbed ad activities. It is very easy to show something better than it is within misleading. But a corporation needs to have advertising rules in mind regarding their publications. An unfair declaration can harm purchasers. Telling the truth would influence the customer towards relief. The advertiser needs to be sure that the impression made by the announcement and disclaimer is not faulted. There should be no deceptive pricing make sure that your offer is honest. Most maximum consumer assurance law contains a broad restriction technique. All purchasers have that right to claim merchants under some consumer protection law.

Conclusion

This review lengthens the techniques of deception and exhibits the typology of price-related deception in the e-commerce industry that reveals numerous ways in which online sellers can deceive consumers via e-commerce platforms through multiple/ false pricing of products. This typology can be used to elevate consumer awareness of various price-related deception schemes used by online merchants. Technology in today's world encourages businesses to understand the interest and preferences and design the product accordingly. Additionally, the Credence Goods make up a lot of share in High-end Fashion, Identifying deception is a wearisome task. Credence Goods provides a lot of opportunities for marketers to deceive consumers by counterfeiting.

A corporation necessitates having advertising ordinances and keeping impressions in mind concerning their advertisements. A deceptive advertisement can head to a negative brand image, therefore it would be better to stay accurate and advertise the product with reliability and integrity. A consumer thus, therefore, examines an advertisement online for a discount offer on a brand yet, when the shipment reaches, the consumer affirms that the advertisement neglected to specify that the clothes were refurbished. A label claims that its products are well suited with a lot of options. But consumers who consult the brand observe that the merchandise is a base prototype with only fundamental peculiarities.

Businesses use the subconscious know-how to emotionally manipulate the consumers through limited-time offers, and long soliloquies from sales diplomats to make people buy products. It helps generate more sales and raise revenue. However, these manipulative measures are illegal and violate customers' rights. Thus, Implications of marketing managers shows the vital impact.

Links of References

- http://www.aims-international.org/aims17/17ACD/PDF/A215-Final. pdf
- https://www.researchgate.net/profile/Madhavi-Sripathi/ publication/344841542_A_Study_on_Impact_of_False_ Advertising_on_the_Consumer_Buying_Behaviour/ links/5f92e32a92851c14bcdeffa9/A-Study-on-Impact-of-False-Advertising-on-the-Consumer-Buying-Behaviour.pdf
- 3. http://shabdbooks.com/gallery/290-june2020.pdf
- 4. https://core.ac.uk/download/pdf/234694084.pdf
- https://www.academicrelated.com/marketing-manager-jobdescription/
- 6. https://3cmarketinggroup.com/useful-marketing/what-is-amarketing-manager.html
- 7. Darke, P. R., & Ritchie, R. J. (2007). The defensive consumer: Advertising deception, defensive processing, and distrust. *Journal of Marketing research*, 44(1), 114-127.
- 8. https://pearl.plymouth.ac.uk/bitstream/handle/10026.1/4367/ Wilkins%2C%20Beckenuyte%20and%20Butt%20%282016%29%20 Deceptive%20packaging%20and%20slack%20filling. pdf?sequence=1&isAllowed=y
- 9. http://citeseerx.ist.psu.edu/viewdoc/ download?doi=10.1.1.736.2052&rep=rep1&type=pdf
- 10. Product-Related Deception in E-Commerce: A ... ResearchGate
- 11. https://www.jdsupra.com/legalnews/playing-fair-avoiding-deceptivepricing-36521/
- 12. https://www.theifod.com/the-three-types-of-goods-and-servicessearch-experience-and-credence/
- 13. Nelson, P. (1970). Information and consumer behavior. *Journal of political economy*, *78*(2), 311-329.

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- 14. https://www.nytimes.com/2019/06/24/technology/e-commercedark-patterns-psychology.html
- 15. https://www.warner.senate.gov/public/index.cfm/2019/4/senatorsintroduce-bipartisan-legislation-to-ban-manipulative-dark-patterns
- 16. https://www.britannica.com/art/fashion-industry
- 17. https://ieeexplore.ieee.org/abstract/document/8763948
- 18. https://www.jstor.org/stable/23043494
- 19. https://dl.acm.org/doi/10.5555/2017483.2017493
- Virdi, I.(2017). Effect of Perceived Deception on Willingness to Buy and Intention to Repurchase: An Exploratory Research. *Proceedings of the* 2017 Annual Conference of Emerging Markets Conference Board, IIM Lucknow. ISBN: 9788-19285-6025, pp. 582-586.
- Virdi, I, (2020). Impact of Perceived Deception on Consumer Behaviour: The case of Detergent Powder. Conference Proceedings of Seventeenth AIMS International Conference on Management- "Management Challenges in Uncertain Environment". IIM Kozhikode. ISBN: 978-1-943295-14-2, pp. 1209-1223.

12 NEP 2020: Innovation & Educational Technology in 21st Century

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Abstract

With a focus on holistic development, innovation and technology, the recently unveiled National Education Policy (NEP) is a much - awaited intervention that will rejuvenate India's higher education system. This paper aims to discuss why and how innovation and Educational Technology can help students to develop intellectual thinking. With technology, educators, students, and parents have a variety of learning tools at their finger tip. Technology has improved teaching and learning. The policy carries tremendous potential to equip its students with the necessary skills through improved school and higher education programs, blurring the lines between academic streams to opening up Higher Education Institutions (HEI) to the world. The National Education Policy 2020 proposes credit - based degrees with a wide range of subjects and emphasis on co - curricular activities. Students will be flexible to indulge in integrated courses and get vocational guidance also. Innovation and educational technology are regarded as vital aspects that would improve the system of education. The members of the educational institutions need to develop their skills and abilities that would enable them to carry out their tasks efficiently.

An effective collaborative environment as well as the use of technology is required in order to implement constructivist strategies to explore the needs of the students in higher education under one umbrella institution, the HECI.

Keywords: Education, Educational Technology, HECl, Innovation, NEP 2020, Teaching and Learning.

INTRODUCTION

Educational Technology has an impact on society and has affected all aspects of life. The influences are being felt more and more at educational institutions. Educational technology provides students and teachers with more opportunities in developing the required skills and talent necessary in 21st century. Society is firmly asking the institutions to actively respond to these technical innovations to develop the skills among learners. Educational technology in education helps to develop a collaborative, communicative and Virtual Learning environment with the use of technology. Today's educational environment is a complex integrity of goals, needs, competing requirements, pressures and dwindling resources. We are now living in a world of computers, internet, laptops, mobiles, i -pads and other technological inventions. We need an educational institution that will give the training and skills to teachers for self - improvement. 21st century education promotes the expansion of the definition of literacy beyond the reading, writing, arithmetic that may have guided what we learnt in school. Literacy may now include topics such as media, physical fitness, yoga, nutrition, guidance and counseling. The need for information and knowledge before was provided by the books, print media, radio, and later the television. In recent times, much advancement has been made in the field of technology. Computer technology encourages both independent and collaborative learning. It is so because learners develop cognitive thinking and learn to explore in an innovative learning environment. The NEP 2020 is planned to support skill education and streamline educational planning, administration, and managements at all levels. It is believed to have an impact on higher education which is going to draw a new roadmap for young minds.

DEFINITION OF THE TERMS USED IN THE STUDY

Education – It is about learning skills and knowledge. It also means helping people to learn how to do things and support them to think about what they learn. It is also important for educators to teach ways to find and use information. Education needs research to find out how to make it better.

Education Technology - The International Commission on the Development of Education defined educational technology, as the intellectual and operational efforts to re-arrange, to regroup or to systematize applications of scientific methods for the organization of equipment and material to optimize the learning process.

HECI (HIGHER EDUCATION COMMISSION OF INDIA)

The NEP enacts numerous changes in India's education policy under one umbrella institution, the **Higher Education Commission** of India, (HECI).

INNOVATION IN EDUCATION

Innovation in education encourages teachers and students to explore, research and use all tools to uncover something new. It involves a different way of looking at problems and solving them. It also improves education because it compels students to use a higher level of thinking to solve complex problems.

NEP 2020 - National Education Policy which was approved by the Union Cabinet of India on 29th July 2020, outlines the vision of India's new education system. The new policy replaces the previous National Policy on Education, 1986.

Teaching and learning – Teaching can be defined as engagement with learners to enable their understanding and application of knowledge, concepts and processes. To teach is to engage students in learning.; thus, teaching consists of getting students involved in the active construction of knowledge.

EDUCATION AND EDUCATIONAL TECHNOLOGY

Education is the manifestation of all round development of personality and helps improve life in a massive way. Educational technology is systematic and organized process of applying modern technologies to improve the quality of education. It is a systematic way of conceptualizing the execution and evaluation of the educational process, i.e., learning and teaching with the application of modern educational teaching techniques. It includes instructional materials, methods and organization of work in an interactive environment, scaffolding the materials to learn more and more. When using educational technology, we should focus on the educational values of the tools and applications we use, how adequate they are in gaining knowledge, whether there is an interaction between users and tools, and if we have positive impact in using them. A number of authors (Clements and Sarama, 2003; Glaubke 2007; Dynarski et al. 2007) suggest that we should focus on five areas of software programs that have the potential to strongly influence students learning experience:

- 1. The educational value of the program.
- 2. Its ability to engage students in learning.
- 3. Ease of use.
- 4. Interactivity between the child and the programs.
- 5. The possibility that the software program monitors the progress of the student.

Educational technology has developed at a rapid pace in the field of education. Educational technology has enabled to overcome the barriers which were an obstacle as compared to the traditional method of teaching in which the control was in the hands of the teacher. The modern technology has a tremendous impact encouraging the students to be active learners of today.

INNOVATION & EDUCATIONAL TECHNOLOGY

One of the major aspects that highlights the significance and meaning of innovation and educational technologies is, they contribute in collecting data in terms of responses of students

(Laying & Twyman, n.d.). It is necessary that new styles of curriculum, leadership and teaching strategies need to be developed in each facility, which will be supportive to the new school organizations that are emerging. The members of the educational institutions have acquired an effective understanding that a conceptual period of increasing length and specific planning is required, if new patterns of curriculum organization are to be understood and implemented. It is apparent that when changes are brought about in modern and innovative methods, the members of the educational institutions are required to augment their competencies. It is also necessary that the individuals need to ensure they make use of modern and innovative methods to promote welfare and productivity (Howard, 1968). The importance of Educational Technology has increased in the classroom. Technologies play a vital role in student's learning and increases cognitive knowledge and deep reflective thinking. The application of educational technology enhances skills and implements a virtual learning environment. National Education Policy 2020 plans an India - centric education system that contributes to transforming our nation sustainably and providing high quality education to all. A holistic development approach is required to implement the 21st century skills among learners.

FRAMEWORK FOR 21ST CENTURY LEARNING

Information and Communication Technologies (ICT) in Education have shifted from how to use technologies to understanding how to teach and learn with technologies. Technologies can be leveraged to support the successful implementation of 21st century institutions and to develop a framework of Life and Career skills, Learning and innovation skills and Information, Media and Technology skills among the learners to make them competent. Students should adapt to the 21st century skills and develop critical thinking, problem solving, communication and collaboration. It is a blend of content knowledge, specific skills, expertise and literacies. It is also essential to develop mastery in creative skills besides core subjects.

21ST CENTURY STUDENTS OUTCOME



Core Subjects and 21st Century Themes

- English, reading or language arts
- World languages
- > Arts
- Mathematics
- Economics
- Science
- Geography
- > History
- Government and civics

In addition to the mastery of these core subjects, it is necessary that schools should also include understanding of academic content at much higher levels by including 21^{st} century interdisciplinary themes into core subjects.

21st CENTURY INTERDISCIPLINARY THEMES

- Global Awareness
- Financial, economic, business and Entrepreneurial literacy
- Civic literacy
- Health literacy
- Environmental Literacy

These themes enable the students to understand and address global issues, make appropriate personal economic choices,

exercising the rights of citizenship at local, state, national and global levels, monitoring personal and family health goals, investigate and analyze environmental issues and addressing environmental challenges.

Learning and Innovation Skills

- Creativity and innovation skill
- Critical thinking and problem solving
- Communication and collaboration skills

A focus on creativity, critical thinking, communication and collaboration is essential to prepare students for the future. Learning and innovation skills enables the students to work more effectively as they learn to explore, explain, expand, elaborate and evaluate their ideas.

Information, Media and Technology Skills

- Information Literacy
- Media Literacy
- Information and Communication Technology (ICT)

Digitization, globalization and industrialization has a tremendous impact on all the aspects of our life. Hence, it is essential that the students develop a mastery and competency to be ICT literate and media literate in the present scenario and to understand legal and ethical issues surrounding the access and use of information technologies.

Life and Career Skills

- Flexibility and adaptability
- Initiative and self direction
- Social and cross cultural skills
- Productivity and accountability
- Leadership and responsibility

To be able to navigate the complex life and work environment, it is necessary to work to develop work efficiency, adequate life and career skills. For students to succeed with the skills and knowledge, students must master to succeed in college, work and life. To be "educated" today requires mastery of core subjects, 21st century themes and 21st century skills. To help students to achieve proficiency in 21st century skills, teachers and administrators need education support systems that strengthen their instructional, leadership and management capacities. And both students and educators need learning environments that are conducive to results. The National Education Policy 2020 of India provides a 21st century framework from elementary education to higher education, vocational education to technical education and new innovative methods of teaching and learning.

THE VISION OF NATIONAL EDUCATION POLICY

- 1. NEP plans to bring a transformation in the overall system of education and provide high quality education to all.
- 2. To develop a deep sense of respect towards the Fundamental Duties and Constitutional values, bonding with one's country, and a conscious awareness of one's roles and responsibilities in a changing world.
- To develop knowledge, skills, and values that support responsible commitment to human beings, sustainable development, and global well - being, thereby reflecting a truly global citizen.

NATIONAL EDUCATION POLICY OFFERS A TRANSFORMA-TIONAL ROAD MAP

- The NEP long term plan as per the policy is that each college would become either fully integrated into a university or converted into an autonomous and independent degree giving institution. An independent board will be established to activate with each Higher Education Institution (HEI), whether college or university.
- Each HEI would come to have a minimum of 3,000 students and tiny colleges which are financially costly would be merged with larger HEIs.

- Free up undergraduate students to take courses across all disciplines, to launch a four - year bachelor's degree, to open India to foreign universities, to incorporate vocational education in college curriculum; and creation of a National Research Foundation and to convert leading colleges into board administered, autonomous degree giving HEIs.
- To draw up a strategy to implement these changes over the next five years. This NEP long term plan is necessary for the holistic growth of the higher education.

Findings

- OECD TALIS study (2013) revealed that teachers who report participation in professional development activities, include the use of ICT.
- Teacher's engagement in and with research and significant changes in practice with a positive impact on student's outcomes were received by Bell et al (2010).
- Teachers need to develop and share ways of using technologies, for research and innovative teaching and learning.
- Teachers also need to be given a chance to work with educational technology and create their own resources.
- The "Decoding Learning" categorized innovations into eight categories based upon the theory of Learning Acts (Manches et.al.2010):
- Learning from Experts, learning with others, learning through making, learning through exploring, learning through inquiry, learning through practicing, learning through assessment, learning in and across settings. It can also motivate to engage in innovative approaches of learning.
- Learners learn better if what they learn is fundamental and in - depth and if the individual competences are strongly anchored to a general concept and if what they have studied has multiple applications. (Lopez, 2010)

Learners can learn better when they are given feedback and are given the opportunity to evaluate their own learning.

Recommendations

- The University Grants Commission (UGC), All India Council for Teachers Education, and the National Council for Teachers Education (NCTE) will be merged this year to form the HECI. The merger is being conducted as part of the structural reforms suggested by the NEP 2020.
- 2. Recommendations like the formulation of the National Higher Education Qualification Framework (NHEQF), Academic Bank of Credit (ABC), Institutional Development Plan (IDP) defragmentation of higher education, designing of virtual labs, evolving the criteria for all the three sets of institutions, bringing all teacher preparation programs under the ambit of the university system, a merit - based tenure - track system, online proctored examination, etc. form part of this category.
- 3. An important aspect of the entire exercise may, however, be how ably the senior level executives and heads of institutions across the states understand the spirit of the intents of the policy statements and effectively and efficiently strategize their implementation.
- 4. The federal government may consider constituting an expert committee for the purpose of ascertaining the quantum of resources required for the implementation of the policy and then making budgetary provisions to meet the shortfall.
- 5. 21st century public education system that prepares students to succeed in the global skills race is the main issue for the next decade. These 21st century skills are more important to students now than ever before so innovation is the core of teaching learning expertise and helps to be a good citizen, be globally aware, has critical thinking, be digitally literate and an effective communicator.

As these are the sets of recommendations, it is imperative to adopt different approaches for their implementation. The new education policy can be successful only after its recommendations are implemented well and develop a roadmap for its implementation.

Conclusion

Improved Technology Enhanced Learning for all in classrooms and home ensures improved learning, better teaching and better research. In order to lead to progression of the system of education in all regions, facilitate the acquisition of education among individuals and enable the members of the educational institutions to carry out their tasks and functions in a wellorganized manner, it is necessary to make use of technologies and modern innovative methods. A collaborative learning environment is necessary for effective innovations in teaching and learning.

References

- Alemu, Birhanu Moges (2015). Integrating ICT into Teaching Learning Practices: Promise, Challenges and Future Direction of Higher Educational Institutes. School of Educational Science and Technology of Teacher Education, Ethopia.
- Bhattacharjee Baisakhi & Deb Kamal (2016). Role of ICT in 21st Century's Teacher Education. International Journal of Education and Information Studies. ISSN:2277 - 3169.
- 3. Kapur, R. (2019). Innovation and Educational Technology. Research Gate.
- 4. Luckin, R. (2016). Mainstreaming Innovation in Educational Technology. Research Gate.
- 5. National Education Policy 2020: UGC, AICTE era over, NEP moots HECI, single regulator with 4 verticals. https://www.hindustantimes.com.
- Pisanu, F. (2014). Educational Innovation and Technology: A need for Integration. Perspectives of Innovations, Economics & Business, Volume 14, Issue 2. ISSN - 1804 -0527.
- 7. P21 Framework Definitions (2009). The Partnership for 21st Century Skills.
- 8. Rajasekar, S. (2007). Computer Education Neelkamal Publications Pvt. Ltd.
- R. Raja & P.C. Nagasubramani (2018). The Impact of modern technology in Education. Journal of Applied and Advanced Research. ISSN: 2519 - 9412.

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- 10. Reimagining the Role of Technology in Education:2017 National Education Technology Plan Update. U.S. Department of Education.
- Sarka Hubackova, Blanka Frydrychova Klimova (2014) Integration of ICT in lifelong education. Procedia - Social and Behavioral Sciences 116. 3593 - 3597.
- 12. Stosic, L. (2015). The Importance of Educational Technology in Teaching. The International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE) Volume 3, No.1.
- 13. Teaching and Learning. vikaspedia. in> teachers corner.
- Vanaja, M., Rajasekar, S., Arulsamy, S. (Ed.). (2014). Information & Communication Technology (ICT) in Education. Neelkamal Publications PVT. LTD. ISBN: 978-81-8316-519-8.

New Anthropometry of Human Services; the Method and Practices

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Abstract

New Anthropometry is an anthropological comparative method which measures and compares humankind in totality. It attempts to gauge humans within species primarily and with other animal species generally. From macro units as measuring rods and calipers to nanometer units as the scale of electron microscope it employs in measuring and comparing humans, are of its content in biological perspective. However, humans can not only be determined completely in this perspective. Socio-cultural and ethological devices, either they are qualitative or quantitative cannot be separated from comparing humans, may it be human community or its close animal species. Thus, it provides basic method of knowing and comparing in all human sciences since the inception of humanity and hence there is a need to reconsider it in its holistic perspectives.

Although paper discusses its conception and misconception, its natural force and gravity is estimated with malevolent intensions during 19th and 20th centuries onward. It is revealed that it was partly caused due to the paucity of the theory in physical anthropology. However, the method looks like a key to provide the data of several varieties by which humans can be compared through the packages of multivariate analysis.

INTRODUCTION

One day a friend of mine came to India and visited my place and in normal courtesy enquired about my current area of interest in Physical/ Biological anthropology. I narrated all but he was astonished after knowing my work still on Anthropometry. He advised me as a good friend to switch over to the current trends of molecular areas of researches rather than concentrating on anthropometric aspects of mankind. He reiterated by saying the world is changing all over and each and every disciplines have been changing but you are still doing 'Anthropometry'.

In fact, this was like an attack on me but I thought seriously and attempted to convince him how I am doing it and did on the human populations of several regions in India. He said, 'yours approach is traditional, now Physical anthropology has realized a sea change. It is swelled with the newer areas like population genetics, biochemical genetics, immunology, physical growth, ecology, epidemiology, DNA fingerprinting and genetic engineering etc. He further uttered, "The anthropometry is an old fashioned technique of research done enthusiastically during 18th and 19th Century A.D. It became almost obsolete up to 1970 and thereafter physical anthropology became new with newer areas of research... Henceforth I put a guestion before him that 'do you think our subject (read 'anthropology') has witnessed a sea change? If yes, then do you prefer to change its name also? If physical anthropology has grown to its maturity with new changes, the name of it should also be changed or not? Do you know what 'anthropometry' was meant in the past and what it realized today and why we are (particularly I am) still doing 'anthropometry'? At this moment my friend became abruptly unanswered and consequently became pale and silent. But this event made me restless as if one has thrown a stone into the silent lake.

I shared this episode with revered teachers, colleagues, researchers and many more to rethink and went to the time when it was emerged in the past. Accordingly I went back and found remarkable facts which assert my ideas further. So, in view of this the present discourse aims at to forfeit tribute and to explore the feasibilities of accepting holistic and unifying perspectives of 'Anthropometry' in the light of its historical and epistemological issues.

CONCEPTUALIZING ANTHROPOMETRY

Etymologically, Anthropometry is made up of two Greek terms anthropos - $\alpha v \theta \rho \omega \pi o \varsigma$ - «man» and metron - $\mu \epsilon \tau \rho o v$ - "measure": measurement of man which refers to the measurement of the human individual. An early tool of physical anthropology, it has been used for identification, for the purposes of understanding human physical variation. In paleoanthropology and in various fields, it attempts to correlate physical with racial and psychological traits.

Juan Comas (1960) defines that "the science of anthropometry may be defined as the systematic techniques for measuring and taking observations on man, his skeleton, the skull, the limbs, trunk, etc., as well as the organs by the most reliable means and scientific methods"

In words of Kevin lan Norton, and Tim okks (1996) 'Anthropometry is a very old science, and like many sciences, has followed a variety of paths and the diversity of anthropometric paths is both its richness and its bane'; whereas Victor R. Preedy (2012) said 'Anthropometry is a widely used, inexpensive and non invasive measure of the general nutritional status of an individual or a population group. It may be defined as Physical measures of humans in Health and Disease'.

International Encyclopedia of Ergonomics and Human factors(Vol. 1.) narrates that the word 'Anthropometry' was coined by

French naturalist Georges Cuvier (1769-1832). Roger Bartlet, Chriss Galton, and Christer G. Rolf (2002) stressed upon it saying 'Anthropometry is a technique that uses measurements of skinfold thickness and limb circumferences in multiple regression equations to predict body density and to calculate body fat and fat free mass.' (Encyclopedia of International Sports Studies; Waldemar Karwowski (2006) however, defines that 'Anthropometry is a technology of measuring various human physical traits, primarily such factors as size, mobility etc.'

However, it has been noticed that 'Anthropometry has been a 'classical method of research in physical anthropology' by which variation in shape and size of the body and bones are quantified' (N. Cameron, J. Hiernaux, Shirley Jarman, W.A. Marshall, J.M. Tanner and R.H. Whitehouse, 1981). Studies indicate that apart from explorations on shape and size of the human body, it studies measurements on bones of lower/ upper limbs, trunks, cranium and mandible.

Thus, all these views if are summed up it becomes crystal clear that that anthropometry pertains to the science of measurement or systematic technique of measuring human body or skeleton. But, the question arises, if it is actually an 'anthropometry'; how it can measure that body of 'Man' which includes tissues, cells, chromosomes, genes, deoxyribonucleic acid, proteins etc. How is it a science of measurement of man who is cultural being rather than animal being! If it is so, Can humans be measured only in terms of body or bone characters!

QUESTIONED JUDICIOUSNESS

Aforesaid enquiries regarding anthropometry fuel its sagacity in anthropology in the light of ours current perspectives in molecular and biochemical genetics, immunology, epidemiology and evolutionary ecology. Do these newer fields have entirely changed our basic and fundamental aims of enquiries regarding man and newer lights can be thrown on the untouched dimensions of mankind only by keeping out anthropometry separate in terms of the newer units and measures. So, why these units and measures cannot be unified with the units of the pre-existed knowledge in
the field of human research!? What tribulations and hazards can be emerged in unifying these quantifiable and discrete units of observation if our basic aims of explorations are either similar or tend to be identical? If one has firm belief in the process of gradual development or punctuation, then why one can condemn the development or evolution of the anthropometry? Here I feel hesitant to think as if the growth of one's body can be possible without caring spine or other basic structures of the body. We exist today as our approach is holistic. We attempt to understand humans holistically covering biological, socio-cultural and archeological fields.

Here I am of the opinion that the approach of 'Holism' a uniqueness of our discipline is at risk!!! I am also unable to understand how holistic approach can possibly be realized without collating, adding or incorporating newer fields of research of humankind? Hence it seems to me; newer roots cannot uproot the older one if we are safeguarding 'the tree' and have wishes to strengthen it. The legacy of it can only be maintained if it has tendency of adaptability or unifying newer things for its revival and survival. So the classical roots or tools can be retained by unifying in the benefit of holistic understanding of 'the science of mankind'.

We all know that the change is the law of nature. The knowledge of the any discipline too changes with the advancements in its field. Any discipline may perpetuate and grows further with the input of the innovative researches. The aim of these researches is to enrich the field in view of older one. The fields of knowledge grow further and may reach at its maturity. It may be understood with an example of winds and breeze. If they do not meet and overlaps with each other, monsoon shall not be developed, then how rains come on the barren land. Each breeze and winds are necessary to make climate habitable. So is with the case of researches. Every drops of the research are essential part of the whole knowledge of a discipline. The researches change but with the continuity of the older state. Every means and methods have its own magnitude. They all are inseparable. They all are progressively emerged. Few developed earlier and few are later. If they are taken with their progression and brought together in a bunch, they can add beauty of the discipline relatively more that they are possessing separately. The progress of the discipline does not mean to marginalize the older ways of observation. It incorporates the ways and paths of the development of discipline.

One may surprise to have thinking that how several tools of researches can be befitted at a platform. Here we all accepts that each tool has its own essential features and as well as natures. The orders and protocols of them might be different. How can they all be brought together needs a holistic vision? This approach is helpful to integrate them all together. This is called holistic-cum-progressive approach. This approach invites and encourage development (of / or holistic discipline) made in view of time (age) and space (geographical region). For example, the knowledge of craniometry and osteometry was brought together with somatometry and cephalometry in the history of anthropometry. But holistic approach was developed and debated only in socio-cultural field of Anthropology during 20th century.

In physical anthropology milestone contributions of later half of 19th and 20th centuries were put in separate columns in view of major input of technology. Such type of hierarchies and boundaries were driven to rationalize the newer current within physical anthropology. But it seems to me that either newer current or gravity of anthropometry was misconceived and misunderstood. It was not taken in tune with the progress made so far in the history of mankind research. But such type of exercise might be due to our traditional mindset. Anthropometrical researches were discriminated by naming it as 'typological' and newer trends as 'analytical'. So without considering the true force of anthropometry and the mental state which enforces technique loving thinkers to compare humans, real goal of the discipline cannot be achieved by holding the umbrella of discrimination.

Although, these lines may surprise to any anthropometrics who are with closed eyes, but those who are able to visualize human holistically, may rethink upon 'how man or woman can be measured in real sense', and also upon why human should not be measured today in terms of the tissues, cells, chromosomes, genes etc. That is why it seems to me that existing concept of anthropometry needs to be revisited and re-approached in the light of current understanding of mankind. Hence it requires observing it in historical and epistemological perspectives.

HISTORICAL AND EPISTEMOLOGICAL PERSPECTIVES

In fact, the journey of the concept of anthropometry began in the age of early men when they start to fulfill their needs by knowing world and ecosystems in the prehistoric times. But the dawn of civilizations across the world witnesses it in the light of rudimentary evidences which indicate about the evolution of the concept of measurement. It was evolution of this concept by which they first initiated the ways of comparison between the material worlds of nature first through which cognitive knowledge profile evolved and understanding of ecofacts matured through comparison and explorations. This tendency and hunger of knowing and learning from experiences made our early ancestors different from other animals who later on created artifacts, shapes and sizes of inorganic materials, tools, and also impacted organic world like, plants, animals etc.

The ways of comparison, thus continued to evolve and such expressions touched the man to compare him or herself with others in view of morphology, strength, brain, behaviour and social structure. In such a way the techniques of comparison might have been evolved in human species in view of either 'function knowledge' or 'structure of the biotic and abiotic domains' but ultimate product was the emergence of the concept of measurement which thereafter was applied to ease the several challenges of human life.

Thus, the units of measurement were probably among the earliest mental and physical tools invented by humankind. As primitive societies needed rudimentary measures for numerous activities such as: constructing dwellings of an appropriate size and shape, clothing, or bartering food or raw materials, we find that they have changed more or less gradually with the passing of time in a complex manner because of a great variety of modifying influences. It is noted that units modified and grouped into measurement systems: the Babylonian system, the Egyptian system, the Phileterian system of the *Ptolemaic* age, the Olympic system of Greece, the Roman system, and the British system, to mention only a few.

If we look at past find the studies in record that the inhabitants of the Indus Valley Civilization (3000–1500 BC) developed a sophisticated procedure of standardization, using weights and measures, evident by the excavations made at the Indus valley sites. This technical standardization enabled gauging devices to be effectively used in angular measurement and measurement for construction. Calibration was also found in measuring devices along with multiple subdivisions in case of some devices (Ambrose, Gavin and Harris 2006).

So it may be focused upon that the earliest known uniform systems of weights and measures seem all to have been created at some time in the 4th and 3rd millennia BC by the ancient peoples of Egypt, Mesopotamia and the Indus Valley, and perhaps also Elam (in Iran) as well. Their measurements were extremely precise since their smallest division, which is marked on an ivory scale found in Lothal, was approximately 1.704 mm (1/16 inch), the smallest division ever recorded on a scale of the Bronze Age. Such kind of measurements although are related with the human livings of that time, but they all are indicative and cognitive examples of anthropometric beginning. The feet and inches are a more accurate indication of the measure used in human life. Other systems were based on the use of parts of the body and the natural surroundings as measuring instruments. Ancient Indian measurements related to the body are correlated to the finger measure of 1^{*}/₄ inch. This measure is found throughout the human body in increments. Early Babylonian and Egyptian records and the Bible indicate that length was first measured with the forearm, hand, or finger (André.1993; Baines and Haslam.2005). The common cubit was the length of the forearm from the elbow to the tip of the middle finger. It was divided into the span of the hand (one-half cubit), the palm or width of the hand (one sixth), and the digit or width of the middle finger (one twenty-fourth)

and the span or the length between the tip of little finger to the tip of the thumb. The inch, foot, and yard evolved from these units through a complicated transformation (Baber, 1996.). Thus these facts openly deliver that ancient anthropometry evolved in view of human needs which might be visualized between the parts of human body and material things of the surroundings that makes livelihood of mankind easier.

The final major researches of ancient times were of Galen, in the 2nd century. He compiled much of the knowledge obtained by previous writers, and furthered the inquiry into the function of organs by performing vivisection on animals. Due to a lack of readily available human specimens, discoveries through animal dissection were broadly applied to humans as well. His collection of drawings was based mostly on dog anatomy. The original text is long gone, and his work was only known to the Renaissance doctors through the careful custody of Arabic medicine (Porter, 1997).

In India, around the 3rd or 4th century the Sushruta Samhita an Ayurvedic text was written. It contains description of 1120 illnesses, 700 medicinal plants, and a detailed study on human forms in the situation of a particular disease. His research led to what is referred to as modern comparative human anatomy. Later on Aelius Galenus or Claudius Galenus (AD 129–c. 200/c. 216), better known as Galen of Pergamon's principal interest was in human species, but Roman law had prohibited the dissection of human cadavers since about 150 BC. Because of this restriction.

Such concepts of measurement also paved the way to manufacture several kinds of measuring instruments. The oldest preserved measuring rod is a copper-alloy bar which was found by the German Assyriologist Eckhard Unger while excavating at Nippur (pictured below). The bar dates from c. 2650 BC and Unger claimed it was used as a measurement standard. This irregularly formed and irregularly marked *graduated rule* supposedly defined the *Sumerian cubit* as about 518.5 mm or 20.4 inches, although this does not agree with other evidence from the statues of Gudea from the same region, five centuries

later. So metrical methods were developed in prehistoric time and continued with the changes in accordance with the need of the society and specific cultures.

The measuring rod found in Rome was 10 Roman feet long, and hence called a *decempeda*, Latin for 'ten feet'. It was usually of square section caped at both ends by a metal shoe, and painted in alternating colours. Together with the *groma* and *Dioptra* the *decempeda* formed the basic kit for the Roman surveyors. The measuring rod is frequently found depicted in roman art showing the surveyors at work.

In the Medieval period, bars were used as standards of length when surveying land. These bars often used a unit of measure called a Rod (unit) of length equal to 5.5 yards, 5.0292 meters, 16.5 feet, or 1/320 of a statute mile. The rod unit was still in use as a common unit of measurement in the mid-19th century.

The "measuring rod" that was also common in the iconography of Greek Goddess Nemesis. The Graeco-Egyptian God Serapis is also depicted in images and on coins with a measuring rod in hand and a vessel on his head. Measuring rods or reeds are mentioned many times in the Bible. The measuring rod also appears in connection with foundation stone rites in Revelation Thus, the shape of measuring rod and other tools were developed too in ancient period. The measurements were taken basically by professionally motivated or skilled class of the human society to find out solutions and ways how humans can survive in the nature.

This gradually improved in due course of time and anthropometric fields like aestheticometry, architecturometry and tailorometry developed in the society either to fulfill the need of human habitat and clothing or to express the realities of life. The ideas and these innovative tools diffused in view of its acceptance as well as its universal application in renaissance. Thus, historically all facts narrate that the tools slowly and slowly developed and used by several artists, sculpturists, painters, and architects generally. The studies report that Leon Battista Alberti(1404-72), Leonardo da Vince(1452 b.), Michelangelo Buonarroti(1456-1564) etc. used

this comparative anthropometry to measure the proportion of statues, so as to make correct copies and figures conforming to the accepted Greek and Renaissance cannons of proportion.

THE 'ANTHROPOMETRON' DEVISED BY- JOHANN SIGIS-MUND ELSHOLTZ

So, as per the available literature credit of doing aesthetic and architectural *anthropometry* in Europe may go to the earlier few mentioned inventers. But history records the work of an innovator Later on a vertical scaled rod named 'Anthropometron' – **anthropometer** was devised by a German physician 'Johann Sigismund Elsholtz' (1623-88) to measure the human body in relation to disease, general character and physiognomy.

Few other anthropometric accounts reveal that Pierre Belon (Born in 1517) was a French naturalist who did research and held discussions on dolphin embryos as well as the comparisons between the skeletons of birds to the skeletons of humans. However, the first scientific data on human craniology comes simultaneously from the sixteenth century, while Andreas Vesalius (1514 – 1564) was a Flemish anatomist, physician, and author of one of the most influential books, Structure of the Human Body. He was professor at the University of Padua and later became Imperial physician at the court of Emperor Charles V. He reported that the skull of the Greeks and Turks were globular, that of the Bulges oblong and that of Germans rounded with a flat occipital region. Thus he paved the way to make foundation of racial craniometry. Spiegel (1578-1625) was next to measure four diameters of skull, viz. facial, vertical, transverse and obligue and thus he, on the basis of it, attempted to classify the skulls.

In 1654, Johann Sigismund Elsholtz published a book entitled *Anthropometria*. This book was written for the benefit of artists and astrologers, as well as for students of medicine and physiognomy. It examines the perceived relationship between proportions of the human body and the incidence of disease. He studied at the Universities of Wittenberg, Königsberg and Padua, where he received his doctorate in 1653. He was appointed court botanist, alchemist and physician to Elector Friedrich Wilhelm

of Brandenburg (1620-1688), and in 1657 was put in charge of Friedrich Wilhelm's botanical gardens at Berlin, Potsdam and Oranienburg(Tanner, 1998)

Thus, Elsholtz was reportedly pioneer to coin the term as well as doing work on anthropometry in the fields of hygiene and nutrition, and in his writings on holistic health, he stressed the importance of clean air and water, healthy food and drink, and also personal cleanliness. He employed anthropometry in medical terms thus *medical anthropometry* was further concretized. Despite the fact, it seems clear that Leon Battista Alberti (1404-72) was the architect among many who reportedly employed measuring rod to have understanding of the human proportions for framing human statues. After a long time in the beginning of the 16th century Vesalius and Spiegel did work on the human cranium that was much earlier than the work done by Johann Sigismund Elsholtz in the 17th century.

However, Harris Hawthorne Wilder (1921) traced its origin back in 1794 when White made the statement basing his assertions upon the observation of both skeletons and living men that the forearm of Negroes in proportion to upper arm, was longer than in the White men. He maintains that White has inaugurated the science of comparative *racial anthropometry* and shown the constant differences in the bodily proportion of the various human races.

But, as reported by many, the racial anthropometry dates back to the times of A.F. Blumenbach (1753-1840), who may be regarded as the "father of racial anthropometry". In his studies he employed physical traits as major tenets. In eighteenth century he influenced entire European countries and classified contemporary humankind into three different types on the basis of the form of the skull as seen from Norma verticalis i.e. Mongolians (square shape), Negroes (long and laterally compressed) and Caucasians (intermediate between former two). Though Blumenbach was regarded as a pioneer to introduce the idea of racial classification on the basis of anthropometry who is also called the father of craniology but the first scientific data on anthropological craniology comes from the sixteenth century as said earlier (Singh & Bhasin, 1986, Rastogi & Shukla, 2004, Das & Deka, 1992, Singh, 1989, Sharma, 1990).

François Bernier, Carolus Linnaeus had scrutinized multiple observable human characteristics in exploration of a typology. Bernier based his racial classification on physical type which included hair shape, nose shape and skin color. Linnaeus based an analogous racial classification system. As anthropologists gained access to methods of skull measure they developed racial classification based on skull shape.

In 1784 Louis-Jean-Marie Daubenton, who wrote many essays on comparative anatomy for the Académie française, published his Memoir on the Different Positions of the Occipital Foramen in Man and Animals (Mémoire sur les différences de la situation du grand trou occipital dans l'homme et dans les animaux). He (1716-1800) endeavored to work on the field of taxonomic anthropometry by observing the position of foramen magnum that varies between the posterior and inferior sides of the skulls in different animals including man. Further he proposed a technique for measuring an angle to determine the inclination. Six years later Pieter Camper (1722–1789), as an artist and as an anatomist, published some lectures that laid the foundation of much subsequent work. Camper invented the "facial angle", a measure meant to determine intelligence among various species. According to this technique, a "facial angle" was formed by drawing two lines: one horizontally from the nostril to the ear; and the other perpendicularly from the advancing part of the upper jaw bone to the most prominent part of the forehead. Camper's measurements of facial angle were first made to compare the skulls of men with those of other animals which provides clue to taxonomic anthropometry..

Swedish professor of anatomy Anders Retzius (1796–1860) first used the cephalic index in physical anthropology to classify ancient human remains found in Europe. He classed skulls in three main categories; "dolichocephalic" (from the Ancient Greek *kephalê*, head, and *dolikhos*, long and thin), "brachycephalic" (short and broad) and "mesocephalic" (intermediate length and width). Retzius (1796-1860) calculated length breadth cranial index to establish the relationship between length and breadth of cranium, whereas Karl Von Bear (1837) followed Retzius to estimate length and height cranial index. Scientific research was continued by Étienne Geoffroy Saint-Hilaire (1772–1844) and Paul Broca (1824–1880), founder of the Anthropological Society in France in 1859. Paleoanthropologists still rely upon craniofacial anthropometry to identify species in the study of fossilized hominid bones. Specimens of *Homo erectus* and athletic specimens of *Homo sapiens*, for example, are virtually identical from the neck down but their skulls can easily be told apart.

However, as maintained by Professor Roberts (1992) contributions made by Paul Broca (1824-1880) was rarest of all. Skulls were collectable eminently and exercised a bizarre fascination. In the first ten years of its existence Broca's laboratory acquired over 4000 crania. Workers trained in the laboratory were highly energetic and are full of enthusiasm. In the report of L' Ecole Pratigue in Peris of 1877, Broca noted that there were 10 volumes of craniometric registers in which were written the measurement made using uniform techniques on more than 2500 skulls of all races. The number of measurement recorded already surpassed 200,000 of all races, an immense amount of material which could be explained for research. The transformation from descriptive craniology to racial craniometry is associated especially with the name of Broca, for not least of his merits but his recognition of the necessity for accurate methods of comparison which led to his devising a multitude of delicate instruments as well as extension of the use of measurements indices in craniological studies. Certainly by the turn of the nineenth century descriptive craniology had been largely supplemented if not supplanted by craniometry, the measurement of length, breadths, angles, capacity and indices derived from these observations.

Thus, the anthropometry developed in many ways but two traditional fields, osteometry and somatometry dominantly practiced by anthropologists and non anthropologists to find out the extent of biological variability and satisfy the needs of students, teachers, and social institutions. The other fields of it developed due course of time could not be integrated as a part of main stream due to the conflicts of insider approaches.

EMERGING THE FIELDS OF NEW ANTHROPOMETRY

Roberts (1992) opined that craniometry was probably an offshoot of the development of racial and paleo-anthropometry in general. According to him it may have begun in 1845 when the Belgian astronomer Adolphe Quetelet (1796-1874) adopted "the term" from Georges Cuvier, and he elaborated his idea in the "*Anthropometrie*" in 1870. Anyhow it seems true that Quetelet might have adapted the term from Georges Cuvier. But from whom Georges Cuvier has extorted this term was previously used by Johann Sigismund Elsholtz in 1654. So, it may be opined that work related with anthropometry have been further forged in either later half of 19th century or in beginning of 18th century which concretized its foundation up to 1850.

Adolphe Quetelet (1796-1874) however, pioneered to apply statistics to anthropometry and social science which he called 'Social Physics'. He was keenly aware of the overwhelming complexity of social phenomena and the many variables that needed measurement. His goal was to understand the statistical laws underlying such phenomena as crime rates, marriage rates or suicide rates. He wanted to explain the values of these variables by other social factors. His most influential book was "Sur I' homme at le development de ses faculties, ou Essai de Physique sociale" published in 1835. In English translation, it is fitted 'Treaties on Man, but a literal Translation would be "On man and the development of his faculties, or Essays on Social Physics". In it, he outlines the project of a social physics and describes his concept of the "average Man" (I' homme moyen) who is characterized by the mean values of measured variable that follow a normal distribution. He collected data about many such variables. Measurements of human traits are grouped according to normal curve. This norman variation helped to provide proof that a population produces enough variation for artificial or natural selection to operate (Tylor 1872, Eiseley 1961, Garabed Eknoyan 2008). Thus, at the beginning of the 19th

century, man's new place at the centre of knowledge radically transformed the intension of physiognomic and anthropometric studies. No longer employed the in the discovery of order, which had preoccupied thinkers during the classical age, they became integral part of new human sciences. Quetelet's anthropometrical treaties, Anthropometrie ou : mesure des differentes Faculties de l' homme, is a telling example of this transformation.

In his Anthropometrie, Quetelet studies the harmony of proportions of the human body. While Lequeu and Campher codified the ideal normative beauty that did not necessarily exist in nature, with their description of the various forms that served the rhetorical interests of representation, Quetelet wanted to demonstrate the existence of beauty through statistics. Not content with looking for measurement of beauty only in litterateurs of past. He wanted to prove empirically that beauty existed in nature and to validate the proportionate systems of past artists by demonstrating that they corresponded to statistical averages that he had compiled. For Quetelet, beauty was not an unattainable ideal. It was statistical measure that described an entire population. It was the physical appearance of the average man, the result of statistical research and the synthesis arising from physical, moral and intellectual laws that control the human race. For Quetelet, the average man was not an abstraction, a mere statistical mean, a type found abundantly in society, characterizing the nation to which he belonged."

Quetelet's understanding of character is vastly different that of Jean-Jacques Lequeu. By equating beauty to normality, he attempted to bifurcate his socio-biological concept of anthropometry from aesthetic anthropometry . His proportions were not the embodiment of the beautiful evidence of order, they were the sum of arithmetic averages, the result of the kind of quantitative and researches that was to preoccupy the nineteenth century. Character was no longer understood to be the result of a comparative analysis of appearances, as it had been during the classical age. It was now deduced, according to the laws of biology, from the internal organization of bodies and the ways in which they function. This shift in emphasis from a comparison of external appearance to a study of internal vital process including its social mechanism had been introduced to comparative anatomy by the French scientist Georges Cuvier (1769-1832). For Cuvier as for Quetelet later, the appearance of living organisms was determined by the internal and natural laws that governed them. These laws needed to be understood in order to discover the 'types' created by nature itself(Bedard Pp 49-50 Duboy, 1986; Kaufmann, 1952; Lemagny, 2002)

Later on in the mid of 19th century AD Samuel George Morton wrote two major monographs, Crania Americana (1839), An Inquiry into the Distinctive Characteristics of the Aboriginal Race of America and Crania Aegyptiaca (1844). He concluded that the ancient Egyptians were not African but white and that Caucasians and Negroes were already distinct three thousand years ago. In accordance with Morton's theory of polygenism the races had been separate from the start. Josiah C. Nott and George Gliddon carried Morton's ideas further. Charles Darwin thought the singleorigin hypothesis is essential to evolutionary theory. He opposed Nott and Gliddon in his 1871 The Descent of Man, arguing for monogenism. In the frontispiece from his 1863 Evidence as to Man's Place in Nature, Thomas Huxley compared skeletons of apes to humans. Thus, racial and taxonomic anthropometry evolved as the main stream of anthropological research in 18th and 19th century apart from the debate unwrapped by Adolphe Ouetelet.

In 1856 the skull of a Neanderthal man was found in a limestone quarry by workers, thinking it to be the remains of a bear. They gave the material to Johann Karl Fuhlrott who turned the fossils over to anatomist Hermann Schaaffhausen. The discovery was jointly announced in 1857, giving rise to the paleoanthropometry. By comparing skeletons of apes to man T. H. Huxley (1825–1895) backed up Charles Darwin's theory of evolution, first expressed in *On the Origin of Species* (1859), and developed the "Pithecometra principle" which stated that man and ape were descended from a common ancestor.

The excavation of the "Java Man in 1891 by Eugène Dubois' (1858–1940) in Indonesia ", the first specimen of Homo erectus

to be discovered, demonstrated mankind's deep ancestry outside Europe. Ernst Haeckel (1834-1919) became famous for his "recapitulation theory", according to which each individual mirrors the evolution of the whole species during his life. A head-measuring tool designed for anthropological research in the early 1910s. Theodor Kocher was inventor of the craniometer Samuel George Morton (1799-1851) collected hundreds of human skulls from all over the world and started trying to find a way to classify them according to some logical criterion. Morton claimed that he could judge intellectual capacity by cranial capacity. A large skull meant a large brain and high intellectual capacity; a small skull indicated a small brain and decreased intellectual capacity. Morton maintained that Caucasians had the biggest brains, averaging 87 cubic inches, Indians were in the middle with an average of 82 cubic inches and Negroes had the smallest brains with a standard of 78 cubic inches (David, 2001). In 1873 Paul Broca (1824–1880) established the same pattern described by Samuel Morton's Crania Americana by weighing brains at autopsy. Modern science has since confirmed that there is a correlation between cranium size (measured in various ways) and intelligence as measured by IQ tests, although it is a weak correlation at about 0.2. Today, brain volume as measured with MRI scanners also finds a correlation between cranium size and intelligence at about 0.4(Chisholm 1911).

Craniometry was also used in phrenology, which purported to determine character, personality traits, and criminality on the basis of the shape of the head. At the turn of the 18th to 19th century, Franz Joseph Gall (1758–1822) developed "cranioscopy" (Ancient Greek *kranion* - "skull", *scopos* - "vision"), a method to determine the personality and development of mental and moral faculties on the basis of the external shape of the skull. Cranioscopy was later renamed phrenology (*phrenos*: mind, *logos*: study) by his student Johann Spurzheim (1776–1832), who wrote extensively on "Drs. Gall and Spurzheim's physiognomical System." These all claimed the ability to predict traits or intelligence and *phrenometry* as a branch of anthropometry was intensively practiced in the 19th and the first part of the 20th century.

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During the 1940s anthropometry was used by William Sheldon when evaluating his somatotypes, according to which characteristics of the body can be translated into characteristics of the mind. Inspired by Cesare Lombroso's criminal anthropology, he also believed that criminality could be predicted according to the body type. A basically anthropometric division of body types into the categories endomorphic, ectomorphic and mesomorphic derived from Sheldon's somatotype theories is today popular among people doing weight training and thus constitutional anthropometry was propounded in the first half of the 20th century.

Forensic anthropologists learn the human skeleton in a lawful setting. A forensic anthropologist can help out in the identification of a decedent through various skeletal analyses that fabricate a biological profile. Forensic anthropologists utilize the Fordisc program to help in the elucidation of craniofacial measurements in regards to ancestry/race determination. One part of a biological profile is a person's racial/ancestral affinity. People with considerable European ancestry generally have relatively no prognathism. People with considerable African lineage characteristically have notable facial projection in the jaw and mouth area (prognathism). Inhabitants with considerable East Asian ancestry are often characterized by a relatively minute prognathism.

In 1883, Alphonse Bertillon established a branch of *Forensic* anthropometry by introducing a system of individual identification that was named after him as "Bertillonage system". It was based on the finding that several measures of physical features, such as the dimensions of bony structures in the body, remain fairly constant throughout adult life. Bertillon concluded that when these measurements were made and recorded systematically, every individual would be distinguishable. Bertillon's goal was a way of identifying recidivists ("repeat offenders"). The system involved ten measurements; height, stretch (distance from left shoulder to middle finger of raised right arm), bust (torso from head to seat when seated), head length crown to forehead and width temple to temple, width of cheeks and length of the right ear and the

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left foot, middle finger and *cubit* (elbow to tip of middle finger). It was possible, by exhaustion, to sort the cards on which these details were recorded (together with a photograph) until a small number produced the measurements of the individual sought, independently of names. The system was soon adapted to police methods which were later known as forensic anthropometry. It prevented impersonation and could demonstrate wrongdoing. Bertillonage was before long represented in Paris by a collection of some 100,000 cards and became popular in several other countries' justice systems.

Physiognomic anthropometry, on the other hand, argued an association between physical features (especially facial features) and character traits. It was made renowned by Cesare Lombroso (1835–1909), the founder of anthropological criminology, who claimed to be able to scientifically identify links between the nature of a crime and the personality and physical appearance of the offender. The instigator of the concept of a "born criminal" and arguing in favor of biological determinism, Lombroso tried to distinguish criminals by measurements of their bodies. He concluded that skull and facial features were clues to genetic criminality and that these features could be measured with craniometers and calipers with the results developed into quantitative research. A few of the 14 identified traits of a criminal included large jaws, forward projection of jaw, low sloping forehead; high cheekbones, flat or upturned nose; handle-shaped ears; hawk-like noses or fleshy lips; hard shifty eyes; scanty beard or baldness; insensitivity to pain; long arms, and so on.(David 2001).

Phylogeography is the knowledge of identifying and tracking major human migrations, especially in prehistoric times. Anthropometry was employed extensively by anthropologists studying human and racial origins: some attempted racial differentiation and classification, often seeking ways in which certain races were inferior to others (Lewis 2011). Nott translated Arthur de Gobineau's *An Essay on the Inequality of the Human Races* (1853–1855), a racial segregationist who made three main divisions between races, based not on colour but on

climatic conditions and geographic location, and privileged the "Aryan" race. Science has tested many theories aligning race and personality, which have been current since Boulainvilliers (1658–1722) contrasted the French people, alleged descendants of the Nordic Franks, and members of the aristocracy, to the Third Estate, considered being indigenous Gallo-Roman people subordinated by right of conquest.

Georges Vacher de Lapouge (1854–1936) in *L'Aryen et son rôle social* (The Aryan and his social role) carved up humanity into various hierarchies, spanning from the "Aryan white race, dolichocephalic" to the "brachycephalic" race. On the basis of *racial anthropometry* he identified the *Homo europaeus* (Teutonic, Protestant, etc.), *Homo alpinus* (Auvergnat, Turkish, etc.) and *Homo mediterraneus* (Napolitano, Andalus, etc.). The Homo africanus (Congo, Florida) was excluded from these groups. His racial classification ("Teutonic", "Alpine" and "Mediterranean") was also followed by William Z. Ripley (1867–1941) who, in *The Races of Europe*, made a map of Europe inhabitants according to the cephalic index of anthropometry.

Vacher de Lapouge became one of the leading inspirations of Nazi ideology that relied on anthropometric measurements to distinguish Aryans from Jews. Many forms of anthropometry were also used for the advocacy of eugenics that sprouted eugenic anthropometry. And during the 1920s and 1930s, though, members of the school of cultural anthropology of Franz Boas began to use anthropometric approaches to discredit the concept of fixed biological race. Researches on skulls and skeletons eventually helped liberate 19th century European science from its ethnocentric bias (Barbach et al 2005). This school of physical anthropology generally went into decline during the 1940 onward.

Other historical studies alleging a Black-White difference in brain size include Bean (1906), Mall, (1909), Pearl, (1934) and Vint (1934). But in Germany, Rudolf Virchow's study led him to denounce "Nordic mysticism" in the 1885 Anthropology Congress in Karlsruhe. Josef Kollmann, a colleague of Virchow, stated in the same congress that the people of Europe, be them German,

Italian, English or French, belonged to a "mixture of various races," furthermore declaring that the "results of craniometry" led to "struggle against any theory concerning the superiority of this or that European race". Virchow later rejected appraisal of skulls as legitimate means of taxonomy. Paul Kretschmer quoted an 1892 debate with him concerning these criticisms, also citing Aurel von Törok's 1895 work, who basically proclaimed the breakdown of craniometry(Barbach and Byron 2005).

Recently Stephen Jay Gould (1941–2002) asserted that Samuel Morton had fudged data and "overpacked" the skulls. A subsequent investigation made by John Michael concluded that "[c]ontrary to Gould's interpretation... Morton's research was conducted with integrity." In 2011 physical anthropologists at the University of Pennsylvania, which owns Morton's collection, published a study that concluded that "Morton did not manipulate his data to support his preconceptions, contra Gould."According to them distinction in brain size, however, does not necessarily imply differences in intelligence: women tend to have smaller brains than men yet have more neural complexity and loading in certain areas of the brain (Gould 1981, Michael 1988, Lewis et al 2011).

J. Philippe Rushton, an author of the book *Race, Evolution and Behavior* (1995), reanalyzed Gould's observations in 1989, and argued that Samuel Morton, in his 1839 book, had shown a pattern of decreasing brain size proceeding from East Asians, Europeans, and Africans.

Similar claims were previously made by Ho et al. (1980), who measured 1,261 brains at autopsy, and Beals et al. (1984), who measured approximately 20,000 skulls, finding the same East Asian \rightarrow European \rightarrow African prototype but warning against using the findings as indicative of racial traits, "If one merely lists such means by geographical region or race, causes of similarity by genogroup and ecotype are hopelessly confounded" (Beals et al 1984 Rushton and Ankney 1996). Rushton's findings have been criticized for confusing African-Americans with equatorial Africans, who generally have smaller craniums as people from hot climates often have slightly smaller crania. He also compared

equatorial Africans from the poorest and least educated areas of Africa with Asians from the wealthiest, most educated areas and colder climates. According to Cernovsky Rushton's study the average cranial capacity of North American blacks is similar to that of Caucasians from comparable climatic zones, though a previous work by Rushton showed appreciable differences in cranial capacity between North Americans of different race (Rushton 1992, 1997). Thus, these studies attempted to explore a debate on behavioral anthropometry.

Ripley's The Races of Europe was rewritten in 1939 by Harvard physical anthropologist Carleton S. Coon. He, a craniofacial anthropometrist, used the technique for his The Origin of Races (New York: Knopf, 1962). Because of the inconsistencies in the old three-part system (Caucasoid, Mongoloid, Negroid), Coon adopted a five-part system. He defined "Caucasoid" as a pattern of skull measurements and other phenotypical characteristics typical of populations in Europe, Central Asia, South Asia, West Asia, North Africa, and Northeast Africa (Ethiopia, and Somalia). He discarded the term "Negroid" as misleading since it implies skin-tone, which is found at low latitudes around the globe and is a product of adaptation, and defined skulls typical of sub-Saharan Africa as "Congoid" and those of Southern Africa as "Capoid". Finally, he split "Australoid" from "Mongoloid" along a line roughly similar to the modern distinction between sinodonts in the north and sundadonts in the south. He argued that these races had developed independently of each other over the past half-million years, developing into Homo sapiens at different periods of time, resulting in different levels of civilization. This raised considerable controversy and led the American Anthropological Association to reject his approach (Rushton 1992, Jonathan, 2002, Relethford, 2003).

Although craniofacial race categorization based on skull indices is explicit, races categorized using alternative methods yield different groups, making them non-concordant (Relethford, 2003). Neither will the process pin-point geographic origins reliably, due to variation in skulls within a geographic region. The United States has group ancestries from geographically remote locations, which have generally remained endogamous. As more migrate and Americans become more racially mixed, such craniofacial recognition is of reduced utility. About one-third of "white" Americans have detectable African DNA markers (Collins-Schramm and others 2002: Shriver and others 2003) and about five percent of "black" Americans have no detectable "negroid" traits at all, craniofacial or genetic (Parra and others, 2001) Given three Americans who self-identify and are socially accepted as white, black and Hispanic, and given that they have precisely the same Afro-European mix of ancestries (Channing 2002; Williams 1995).

While this method produces useful results for the population of the United States, it is likely that it would not be reliable for populations from other countries or historical periods.(Frank L'Engle Williams, Belcher, and Armelagos pdf online).

Anthropometric studies currently are conducted to investigate the evolutionary significance of differences in body proportion between populations whose ancestors lived in different environments. Human populations demonstrate climatic patterns of variation similar to those of other large-bodied mammals, following Bergmann's rule, which states that individuals in cold climates will tend to be larger than ones in warm climates. The Allen's rule states that individuals in cold climates will tend to have shorter and stubbier limbs than those in warm climates. Currently these issues are addressed in a field of environmental anthropometry.

Anthropologists use morphometric variation on a micro evolutionary level to reconstruct small-scale population history. For instance John Relethford's studies(2003) of early 20th-century morphometric data from Ireland show that the geographical patterning of body proportions still exhibits traces of the invasions by the English and Norse centuries ago.

Anthropometrists working for private companies and government agencies conduct studies to determine a range of sizes for clothing and other items. Measurements of the foot are used in the manufacture and sale of footwear. Measurement devices may be used either to determine a retail shoe size directly (e.g. the Brannock Device) or to determine the detailed dimensions of the foot for custom manufacture e.g. ALINEr(Goonetilleke, Cheuk Fan, et al 1997). Such type of anthropometry is called *industrial or occupational anthropometry*.

Today *medical anthropometry* is also performed with threedimensional scanners. A global collaborative study to examine the uses of three-dimensional scanners for health care was launched in March 2007. The Body Benchmark Study will investigate the use of three-dimensional scanners to calculate volumes and segmental volumes of an individual body scan. The aim is to establish whether The Body Volume Index has the potential to be used as a long-term computer based anthropometric measurement for health care. In 2001 the UK conducted the largest sizing survey using scanners up to date. Since then several national surveys have followed in the UK's pioneering steps, notably Size USA, Size Mexico & Size Thailand, the latter still ongoing. Size UK showed that the nation had become taller and heavier but not as much as expected. Since 1951, when the last women's survey had taken place, the average weight for women had gone up from 62 to 65 kg.

Measurements involve directly in the examinations of brains from corpses, or more recently, imaging techniques such as MRI, which can be used on living persons. Such measurements are used in the researches on neuroscience and intelligence. Brain volume data and other craniometric data are used in mainstream science to compare modern-day animal species, and to analyze the evolution of the human species in archeology. With the discovery that many blood proteins vary consistently among populations, followed by the discovery of the DNA code, the invention of the polymerase chain reaction and the decoding of the human genome, phylogeographers largely switched away from *classical anthropometry* whenever DNA is available.

Anthropometric measurements also have uses in growth and nutritional disorders, for example in helping to determine the relationship between various body measurements (height, weight, percentage body fat, etc.) and physical growth outcomes. Anthropometric measurements are frequently used to diagnose malnutrition in resource-poor clinical settings. Such kind of anthropometry which is termed as *nutritional anthropometry* plays an important role in total health care of child, women, and old age peoples particularly. Changes in life styles, nutrition and ethnic composition of populations lead to changes in the distribution of body dimensions (e.g. the obesity epidemic), and require regular updating of anthropometric data collections.

Anthropometrical researches regarding physical performances were given a good deal of attention by anthropologist in recent past. Training centers and departments on physical education were established by the respective govt. non-govt. organizations in schools colleges and universities across the countries to promote sports and such type of competitions. This gives Kinanthropometry or sports anthropometry a momentum to flourish which is defined as the study of human size, shape, proportion, composition, maturation, and gross function, in order to understand growth, exercise, performance, and nutrition. Its application to movement and those factors which influence movement, including: components of body build, body measurements, proportions, composition, shape and maturation; motor abilities and cardio respiratory capacities; physical activity including recreational activity as well as highly specialized sports performance (Stewart, 2010).

Ergonomic data about the distribution of body dimensions in the population are used to optimize products. Designs that are incompatible with normal anthropometric measurements of a workforce could result in undesired incidents. The misfit of a heavy equipment cabin to a worker could produce operator blind spots that expose workers on foot to strike by injuries. Inadequate length or configuration of seatbelts could lead to non use of seatbelts, which will affect post-crash survivability. Inadequate fit of personal protective equipment cannot provide workers with sufficient protection from health and injury exposures (Hsiao and Halperin, 1998). Existing data on the size and shape of industrial workers is sparse, at best. Because of the lack of anthropometric data for the general worker population, safety researchers have generally had to rely on data drawn from studies of military personnel, most of which was collected during the 1950s through the 1970s. However, substantial anthropometric variability exists among the various U.S. workforce populations, and they are quite different from the average military population. Industrial workers, such as the agriculture, truck driver, and firefighter workforces, are even anthropometrically very different from the average civilian population (Hsiao et al, 2002).

Diverse workforces in many occupations, as well as new roles for women in the workforce, require body size data for designing adequate workplaces, systems, and personal protective equipment. In the past, variance in body dimensions was typically reported as means and standard deviations for various body segments (Roebuck et al., 1975). This approach was successful in generating ergonomic anthropometry and its general, broad parameters for personal protective equipment (PPE) sizing but was deficient in generating the detailed fit information needed for workplace, PPE, and other equipment design.

Technological development in recent years has advanced the basic science of human size and shape studies in 3-dimensional forms (3D), and computer-generated human models are now available for anthropometric analysis. These advances in anthropometric science and computer-based human-form modeling have opened various research avenues for improving workplace and protective equipment design as well as anthropometric fit within complex systems.

Thus, this brief anthropological discourse enthuse me to understand that the courses of anthropometry were initiated in past to rationalize the specific need of the time. In the pre and proto-historic age the challenges which were probably faced by man were how to survive in the strange world or 'which is edible or which is forbidden to eat!! Such type of queries made our early ancestors to calculate through comparison at first site. Experiments and practices made them wiser after events and events.

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Such kind of comparative mind of pre/proto-historic or ancient or medieval man made them to explore comparative units. As body is nearer to mind than all in any time and space, it is used first to measure matters available in the surroundings in view of the basic needs and later on it(i.e. body) became itself a subject of comparison in view of bio-psychic and secondary needs of mankind.

Anthropometry as a comparative method is thus a human product which has been used in view of the understanding of mankind itself since the beginning. Although it has experienced changes constantly and has shown enthusiasm to include the newer and contextual fields of human life in past and present, but from 1890 to 1950 (more than half century) it records those schools which have been incompatible. Besides, the multiplicity of body as well as skeletal measurements had turned out to be burden for researchers of that time. The similar measurement was taken by the different workers in different ways, leading to lack of comparability. Somehow or the other it was endeavored by few organizations to commonly address these problems. The concordats were established in a number of international conventions, for example those of Monaco (1906), and Geneva (1912) and a special committee of the international congress of anthropology and ethnological sciences came into being to coordinate techniques. Yet a decade later, in a review of the question as it affected methods adopted to measure the living. Mahalanobis, estimated that, "fully from 53% to 70% of the usefulness of the material is wasted owing to lack of agreement in definitions in techniques". Later on in 1940's and 1960's almost general consensus emerged in view of anthropometric techniques.

However, from 17th to 19th centuries the anthropometry could have moved on with the schools of different ideas. Few other horizons were also emerged in the sphere of biological sciences which became turning points even in physical anthropology in this period. By the time of World War 1, anthropometry experienced political skirmishing on racial misconceptions and it could be limited only to the techniques of osteometry and somatometry. Although it was known to be initially originated in view of comparative observations or measurements on body, in relation to basic needs, sense of beauty and painting, health, hygiene, nutrition and disease; but due course of time it included cephalofacial and other measurements of the body to find out large extent of morphological variation in contemporary human populations. Thereafter, these measurements were associated with intelligence and personality traits, but with the emergence of controversies regarding the handling of instruments, methods of taking measurements, orientation of body and bones etc, it took a long time to search for internationally acceptable techniques. In consequence the anthropometric spectrum could not be broadening further beyond the area of 'osteum' and 'somatas' ;apart from anatomical, ecological, genetic, behavioral cytological and chromosomal researches appeared even before 1950 within the matrix of physical anthropology.

But, the anthropometric measurements taken either on the skeleton or on the body surface or on the bones of the mankind comprise the aspects of body constitution or physique only. Are all these measurements taken either on body surface or bones of man entirely capable to fulfill the basic aims and objectives of the methodological branch of anthropology? Can anthropos be measured holistically on the basis of somatological and ostological domains. Can socio-biological as well as microscopic measurements not be able to contribute to the holistic scale of humans? Can osteometry and somatometry be a methodology which measure human in totality not anything else? Such curiosities may go on endlessly to find out crux of anthropometry. If we observe magnitude of the discipline closely we find that since population variation and racial variability had been main agenda of those days when anthropometry was struggling during nineteenth and first half of the 20th century. The newer fields of researches like physical growth, development, medico-legal applications, constitutional medicines, sports, nutritional and adaptability were started to be emerged later as the research fields of physical anthropology.

At this stage D.F. Roberts (1992) rightly pointed out that in the 1920's to 1930's a vast amount of metrical data existed which were virtually unused in biological problems. The situation at that time began to change. There were ripples on the surface of anthropology from the new science of genetics. Application of Mendel's laws to human populations showed the lack of substance in the typological concept below the species level. They showed the dynamic nature of equilibrium, with the gene frequencies of the populations remaining stable from one generation to the next unless acted upon by evolutionary processes. Evolutionary affinity among populations, their phylogeny could be much more accurately demonstrated by the use of genetic characters, uncontaminated by the possible effects of environment. This led to the genetic exploration of the world's peoples which reached its zenith in the postwar decades, with succession additions to the armamentarium of the genetic variables. Such anthropological applications in their turn led to discoveries of new variation. The outcome was a new realization of the extent of genetic individuality.

Further progress in genetics assimilates with the notion of ecology, physiology, nutrition, development, epidemiology, demography and molecular biology. Many new horizons of physical and biological anthropology emerged in its new phase (the notion of New Physical Anthropology given by Professor S.L. Washburn in 1951) almost entirely marginalized the researches pertaining to racial anthropometry. Anthropometry, thus, could not progress to the real extent as a scientific and metrical procedure of "anthropos". However, any methods of any branch of knowledge grow either with the change in time and space or with phenomenal change in view of its aims and objectives. If it is contextual with time, it happens in the forms of growth. If the science of man (physical anthropology) changed with the Darwinian and Mendelian revolutions, why any change could not appear in the metrical method of man despite the fact the metrical techniques emerged constantly like biometry, chromometry, cytometry, genometry sociometry, and so on. In addition, these techniques attempt to measure the cellular, social etc. aspects of man in terms of units (like quantitative, qualitative, discreet) of comparison.

Somehow, the efforts of R. Collignon in 1892 international unification for human comparison initiated standardization of anthropometric methods adapted by these schools. The methods established by German and French schools were although variable but lack the basic aims of data collection. Few of them were also followed by the investigators of other countries apart from British workers. As they were entirely non-comparable at the cross-continental or international level due to the differential ways followed in taking data, so the first step towards the desired unification was taken at XIII International Congress of Prehistoric Anthropology and Archaeology held in Monaco in 1906. XIV Congress which met in Geneva in 1912 succeeded in having the "International Agreement for unification of measurements on the living subjects". Such congress, conferences, committees were continuously held later on. Many deliberations made were incorporated later in the International Agreement Report. After World War II, Henries Vallois has finally compiled the techniques of measuring human body and its various segments on the basis of this international agreement which was published in Current Anthropology as a report entitled "Anthropometric Technique (Vallois, 1965 Vol.6, p. 127).

So, it seems to me the history of anthropometric development experiences numerous ups and downs in the period of egoistic wars, conflicts and clashes, and differences could not be sorted out smoothly. Henceforth it has forced this branch of human comparison to be marginalized in the beginning of 20th century. In fact, the dilemmas and controversies dominated during four five decades which became major hurdles and hazards of anthropometry to flourish as the holistic methodology of comparison. It has paved the way to the techniques of population genetics to emerge separately in physical anthropology. Furthermore, domination of the Darwinian era, emergence of Mendelian and Hardy-Weinberg principles made greater impact on evolutionary and contemporary racial researchers in anthropology, making anthropometrical methods of lesser importance due to its classical and traditional approach.

Since anthropometric researches carried out from 18th to 20th centuries are mostly by the investigators of physical stream rather than socio-cultural anthropology. The area of interest of all leading scholars is physique or body constitution. They followed typological or classical approach as they had belief in spatial distribution of physical traits among human species. Due to the lack of the concept of population gene pool and its matrix of continuity from generation after generation these researchers could not contribute beyond the physique to anthropometry. Consequently, the science of measurement of man could be only as the science of measurement of human physique. Therefore, it may be called as physicometry rather than anthropometry.

As indicated earlier that by the first half of the 19th century man could be measured in its physical dimension, from Vesalius (1514-1564) to Frederick S. Blumenbach (1753-1840), it was conducted so because of the need of that period. Without hiring typological approach, it was difficult to identify species and place of human species in animal kingdom. But after exaggeration of Paul Broca(1824-1880) on racial discourse, rat race on raciometry enforced anthropometry to be vulnerable and 'typically typological'. Thus from 1880 to 1950 anthropometry neither could explore its new horizons which can deal with biological issues nor did it participate with the newly burned prospects of the social and biological sciences. In spite of availability of other modus operandi of metrical researches it believed in osteometry and somatometry. Such type of tapered approach must raise question that whether man can be measured physically in view of only body surfaces and bones and not can be measured biologically or genetically on the basis of other cellular, chromosomal, and genetical parameters. Can man only be measured in inches and centimeters not on the basis of other units like, micrometers or molecular and nano units. Secondly if we are able to measure from cells to molecules and their organelles (in micron) today, and such studies are able to describe humans biologically, then why

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genomic studies cannot be a part of the methodology of human measurements i.e. anthropometry. Beside, behavioral domain of mankind is also being measured by using modules of human measurement whether we take the fields of society, culture or mental state or economical pursuits. Several socio-cultural aspects of mankind are being applied to measure humans and humankinds. Though units of measurement may be a subject of debate, but it may be solved with the unifying approach of our discipline. It may also be discussed in view of metrical systems of sociometry, psychometry and econometry etc. which are also developed in anthropometrical pattern in other human sciences.

Moreover, if we call it as 'Anthropometry', it is in tapered sense and there is a colossal crisis of its identity. It is so, because few other metrical techniques of biological sciences emerged in 20th century like, cytometry, flowchromometry, photogrammetry, physiometry, radiographic measurement and so on. With the discoveries of electronic microscope and computer systems, metrical methods were revolutionized and now they are capable to measure even the ultra microscopic structures of the human body like chromosome, cellular organelles, deoxyribonucleic acid, etc. The units of measurement became minuscule like, micron, armstrong molicute etc. apart from inches, centimeters, and millimeters. From molecule to the organ of the human body became the subject matter of human study. The muscular and skin fold measurements have already been merged with the curricula of the metric methodology. Thus, the contents of metrical system puffed up whenever we see across its boundaries. Although anthropometry today more or less practice not only its traditional form, but also it have began to employ few innovative tools as colorimeters, spectrometers, radiographs, scanners etc. apart from of the traditional tools by which bones and body parts are measured in multiple dimensions as discussed earlier.

If we have a glance at its earlier approach of measuring the subject/ person, it proceeds with socio-cultural and biological characteristics which are rarely used in conducting and analyzing anthropometric data. Statistical constraints like, mean, deviations, etc. were happened to be more useful in interpretation of

the report. Perhaps, this used to be sidelined and the sociocultural information of the subject has seldom been utilized in interpretations of the findings. All researches pertaining to it are processed in full swings of statistical mode. Comparative evaluation on the basis of the various measurements taken (on the body/ bone) depends more upon statistics due to the enormous variability or similarity. The interpretation of the results used to become so hectic and problematic due to the variety of data. In consequence, it is used to be seen in anthropometrical analysis researchers, either consciously or unconsciously ignore such socio-cultural data although such information's were taken initially either in view of the holistic understanding of that group or in view of their socio-cultural /ethnic identity within the universe or geographical area. The social/cultural variables which are primarily enquired from the group of the subjects these might not be ignored by any means because these information enrich the basic understanding of the anthropometry.

Hence, Anthropometry does not mean, in real sense, to mere morphological or physicometrical devices of mankind, but it is meant by the explorative methods in view of biological and social-cultural understanding of mankind. Such fuller and complete discovering methods need to be relooked upon what we have practiced it in the past and practicing even today. If we wish to have holistic understanding of the measurement of man (i.e. anthropometry) we have to rectify our faulty practice by asking ourselves with questions like- what is Anthropometry, which are the bases of it, why is it called Anthropometry and how has it emerged? Is Anthropometry a technique, or a method or a procedure or a methodology? These explorations regarding the methodological branch of anthropology move on towards the aims and objectives of it. As has been discussed earlier that anthropometry stands primarily by a methodology of measuring man holistically not partially.

Therefore, it is inevitable today that mankind cannot only be measured in terms of physique but also this species can be measured in view of the cellular, chromosomal, genetic, biochemical, molecular, socio-cultural and ecological units. Gone those days when we relied in measuring surface traits mere in one or two dimensions, today any human trait can be measured in multiple magnitudes with help of the tools of socio-biological and computational technology. Thus, in view of increasing today's need and rationality of anthropometry, this method has to be in such a form that does not struggle for its own identity. Its acceptance will certainly increase if it is worth as it means by the term. The reliability of this method is enhanced too; when it meets the expectation emerged from concept of mankind as well as the method is capable to address existing problems of humans cumulatively.

Conclusion

In conclusion, it may be stated that initially anthropology was meant by physiological, anatomical and physical study of man and with the same reason anthropologists like F.S. Blumenbach had proposed to coin the term "Physical Anthropology" in place of using "Anthropology". The history unfolds that Buffon, Blumenbach, Paul Broca etc. of European schools as well as many others leading anthropometrists have given much importance to racial studies in terms of the physique and body constitution. So this had been the mainstream of anthropology for centuries and contribution made by few other schools like British, American etc had been separated. Later on the methods of doing enquiries could not support each other as former schools had been stressing upon quantitative approach of data collection whereas British, American schools of socio-cultural anthropology had attempted to focus on qualitative approaches of data collection.

However, the nineteenth and twentieth century's had experienced an enlightenment in view of the growth of our discipline by establishing fundamental theories of culture and social change on the one side, Genetic and evolutionary thoughts on the other. Darwin, Mendel, Hardy Weinberg, De Varies, Wright, Haldane, Dobzhansky, Julian Huxley, Ernst Mayr and so on have given an illuminating path to physical anthropology. This kind of spark in the discipline has marginalized the classical anthropometry. However, few anthropometrists such as Martin, Saller, Bertillon, Wilder, Hrdlicka, Hooton, Montague etc.

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considered anthropometry as the finest method of research in physical anthropology. But they were unable to propagate the basic meaning of anthropometry. They have given this a separate identity instead they tried to correlate this with other biological and genetical researches initiated in physical anthropology. This phase of anthropometrical development was full of struggle and the works done during this period were typically on physicometry or on morphoscopy. But such kind of work was related with an aspect of anthropometry, not with its holistic coverage

Secondly, those, who have reserve opinion on typological approach of anthropology as proposed by Linnaeus in 1735 for classifying animal kingdom, do not have basic understanding of human mind which never stop at any given point. It always attempts to see that which is unseen. Classification, clumping and clubbing perhaps would have been a mathematical calculation since the beginning of human civilization. But that approach could not have been universally acceptable and perhaps this could have stimulated only the intellectuals of a particular region. Such typological approaches were also developed even in Vedic period and thereafter in ancient India too, when peoples were used to classify peoples and measure body constitution as the units. Such apparent facts compel us to think that curiosities and questions always motivated us to know which is unknown, unseen, and inexperienced. I think such quest and thrust of human nature later on quantify after knowing a tip of the iceberg. First of all it was experimented on plants then the same knowledge was applied on animals and humans. We know that it was Linnaeus in 18th century who could revolutionize the scientific world to some extent. But it would be untrue that there were no other who had not the similar thoughts of typology because human mind has always been mathematical that recognize the things through the inherent/ inbuilt unit of comparison although the approach may vary in view of the existed knowledge.

Holistically, humans are identified not only by body parts but several other behavioral and cultural traits are involved in characterizing this species. These traits are of several kinds by which today man New Anthropometry of Human Services; the Method and Practices 245

can be measured not only in terms of quantitative values; but also qualitative variables are needed to be processed in measuring mankind. *Hence, New Anthropometry being measurement of man in true sense, involves both the quantitative and qualitative values (units) to compare humans and humankind with others. In quantitative units it covers the bones and morphology of man, whereas qualitative units contain enumeration of frequencies as well microscopic observation/ measurement of the fundamental elements that value the specificity of mankind.*



Fig. 1 Measuring Human Body and other components which make us Human

Moreover, few may opine that measuring tools of aforementioned fields emerged separately in accordance with the specific need and the fulfillment of their specific objective. Therefore, they cannot be brought all together as for granted. At this juncture I further defend my point of view by saying that although anthropology itself shares some contents of its nearer fields, but without accepting holistic approach, it cannot achieve its basic aims. So in view of achieving its inherent aims it cannot afford without measuring and comparing humans in totality. At this stage, anthropometry emerges a unique method which is able to club and collate all tools and techniques which can illuminate several aspects of mankind. And it has been its uniqueness that it is distinct in spite of unifying and merging the thrust areas of research in anthropology.

It may be classified in accordance with the emergence of units. Since physicometry emerged initially with the quantitative approach as it has its historical significance. In so far as qualitative 246 Recent Research and Innovation: An Integrated Approach

units are concerned, these tools of human research ought to be unified and collated in the following evolutionary and holistic perspective:

Here, Conservatives may question saying why morphoscopy is kept along with the several forms of anthropometry? In defense I may submit that anthroposcopy has been always taken as a relevant technique of physical observation because one observes the nose not only in sake of mere observation, but these are quantified as the categorical variables of mankind. The form of nose and others have been subdivided and several observations are further classified to find out the magnitude of human variation. Although such kind of approach is qualitative but at the same time these characters attempt to measure mankind when they are considered statistically.



Fig. 2 Proposing New Scheme of Anthropometry in view of Evolutionary and Holistic Perspectives

Secondly, in so far as human behaviors are concerned they are processed statistically in terms of the traits and patterns. The patterned traits manifest a complex of culture. The traits have been taken as a qualitative unit of the study of cultures and societies, but the frequencies of these traits have been usually quantified by several investigators. The research techniques like sociometry, econometry, psychometry etc are emerged on the basis of the tools of data collection like observation, interview, questionnaire schedule, etc. in the past centuries. Recently, focused group discussions, photographs, maps, high tech aids etc are major tools which supplements and add a huge amount of socio cultural and ecological data where human inhabit. As all such tools of research are aimed at either to quantify or qualify the socio-cultural aspects of mankind to large extent like biometry; hence, statistical laws might be applied similarly for drawing inferences. Such kind of unification and lumping is only possible when subjectivity and biasness are minimized in view of maximization of the objectivity of scientific research at the level of biological researches.

In fact, the questions we ask about the human condition may differ across the human sciences but methods belong to all of us (Bernard, 2008). Whatever our epistemological differences are, the actual method for collecting and analyzing data belong to everyone. Since collection of data belongs to several variables of a population, they may be conceptual or operational, uni-dimensional or multidimensional, dependent or independent; to record the value for these variables, several tools and techniques may be employed. But some variables may be easily observed and measured as they are operational like height, weights, angles, circumferences etc. Others are more conceptual like power, social class, willingness to change, attitude, educational grade etc.

But somehow or the other all variables are concepts or constructs (Bernard 2008). Some concepts like height and weight are easy to measure, while other concepts like religious intensity, jealous, compassion, willingness to accept new agricultural technologies and tolerance for foreign fieldwork are complex and difficult to measure. It may be measured if we develop a scale in accordance with the research design. Measurements can also be improved lowering the probability of and the amount of error (Bernard, 2008).

Bernard (2008) reiterates that although it is easier to measure some concepts than others, but the fact is, all measurement is difficult. Peoples have worked for centuries to develop good instrument for measuring things (like body and bones in somato and osteometry). They also may be attempted in view of the measurement. Since complex variables are conceptually defined by reducing them to a series of simpler variable. For example, saying "the people of Lucknow are highly cosmopolitan" can be interpreted in many ways. But some concepts are not variables. The concept of positivism in social sciences is not a variable, but the concept of "philosophies of sciences" is a variable and positivism is one member of the list of these philosophies. The concept of "love" is not a variable but the concept of "being in love or not" is a variable. The concept of "culture" is not a variable but the concept of "belonging to a particular culture" is a variable.

One may question here if all variables are concepts or constructs, then how can other culture/ society be measured or compared in somatometry or cephalometry where instruments have one scale for every population. It may further be defended by making standards or conceptual definitions as British anthropologists have done a milestone job in 18th -20th centuries by testing the definitions of concepts and proposing changes in existed universal definitions of the concepts of several institutions (Leach 1968, Saran 2008). Anyway, measuring variables is one of our biggest challenges when *behavior-o-metry* is concerned. If indicators are defined for every variable, the levels of measurements can be determined. Most social scientists recognize the four levels of measurements, in ascending order: nominal, ordinal, interval and ratio. These levels determine the values which are required to put on a standard scale for a particular variable.

Therefore, it may be concluded that discipline survives with its consistency of theories; but theories prevail while they are tested comprehensively with the methods, of research design, data collection and rigorous analysis. If there is a lag of data, discredit goes to the methods of data collection. If method is concrete and competent enough to fulfill the need and holistic aim of the discipline, the stream of the knowledge survive and able to swim over the ocean of all sciences evolved today. As our nature is interdisciplinary, so we are in need of developing a holistic method of measurement as a unique science. If we deal with mankind in totality, here I find only 'New Anthropometry'
which emerges as a multidimensional and primary method in anthropology which is competent enough to collect biological and socio-cultural (ethnological) and archaeological data of humankind. Such ways of knowing unknown aspects of man and mankind might be identified with the interpretive holism. The threats of assimilation with the fields of other social and biological sciences can also be counteracted with this method as a Laboratory cum Field method of humankind comparision.

References

- 1. Ambrose, Gavin; Paul Harris, 2006, Fundamentals of typography Lausanne; Worthing: AVA Academia, p.59).
- André, Jacques (1993). "Font Metrics". In Hersch, Roger D. Visual and technical aspects of type. Cambridge, England: Cambridge University Press. p. 64.
- 3. Anthropometry, 1934. The International Committee for Standardization of the techniques of Physical Anthropology. Man 34, 109.
- Anthropometry, 1936. The International Committee for Standardization of the techniques of Physical Anthropology. Am. J. Phy. Anthrop. 21, 287.
- 5. Asheley Montagu, M.F. 1960. An Introduction of Physical Anthropology. Charles C. Thomas, U.S.A.
- Baber, Zaheer, 1996. The science of empire: scientific knowledge, civilization, and colonial rule in India. Albany, NY: State University of New York. p. 23.
- 7. Baines, Phil; Andrew Haslam (2005) Type and typography London: Laurence King p.93).
- 8. Bartlet, Roger ; Chriss Galton, and Christer G. Rolf. 2002. Encyclopedia of International Sports Studies
- Bernard, H. Russel, 2008. Research Methods in Anthropology: Qualitative and Quantitative approaches. IVth ed. Rawat Publicaiton Jaipur, India.
- 10. Broca, P. 1881. La torsion de Phumerus et le tropometre instrument destine a measure la torsion des os. Rev. Anthrop.4, 193.
- Carol Channing, Just Lucky I Guess: A Memoir of Sorts (New York: Simon & Schuster, 2002); Gregory Howard Williams, Life on the Color Line: The True Story of a White Boy who Discovered he was Black (New York: Dutton, 1995)

250 Recent Research and Innovation: An Integrated Approach

- 12. Cernovsky, Z. Z. (1997) A critical look at intelligence research, In Fox, D. & Prilleltensky, I. (Eds.) Critical Psychology, London: Sage, ps 121-133.
- 13. Chisholm, Hugh, ed. (1911). Encyclopædia Britannica (11th ed.). Cambridge University Press
- 14. Comas, J. 1960. Manual of Physical Anthropology. Charles C. Thomas, U.S.A.
- 15. "Cultural Biases Reflected in the Hominid Fossil Record" (history), by Joshua Barbach and Craig Byron, 2005, Archaeology Info.com webpage: ArchaeologyInfo-003.
- 16. Das, B.M. and R. Deka, 1992. Physical Anthropolgy, Practical Kitab Mahal, Allahabad.
- 17. David Hurst Thomas, Skull Wars Kennewick Man, Archaeology, And The Battle For Native American Identity, 2001, pp. 38 - 41
- E.J. Parra and others, "Ancestral Proportions and Admixture Dynamics in Geographically Defined African Americans Living in South Carolina," American Journal of Physical Anthropology 114 (2001): 18-29, Figure 1.
- 19. Emil Kaufmann. Three Revolutionary Architects: Boullée, Ledoux, and Lequeu. American Philosophical Society, 1952.
- 20. Evolving Knowledge of Sex Differences in Brain Structure, Function and Chemistry. by Kelly P. Cosgrove, PhD, Carolyn M. Mazure, PhD, and Julie K. Staley, PhD, et. al
- Forensic Misclassification of Ancient Nubian Crania: Implications for Assumptions about Human Variation, Frank L'Engle Williams, Robert L. Belcher, and George J. Armelagos (pdf)
- 22. Galton, F. 1884. Anthropometric Laboratory, London. (also in J. Anthrop. Inst. Lland) 1884: 14, 205.
- Goonetilleke, R. S., Ho, Edmond Cheuk Fan, and So, R. H. Y. (1997). Foot Anthropometry in Hong Kong . Proceedings of the ASEAN 97 Conference, Kuala Lumpur, Malaysia, 1997. pp. 81-88.
- 24. Gould, Stephen Jay. 1981. Mismeasure of Man . W. W. Norton & Company. Pp. 352. ISBN 0-393-01489-4
- Heather E. Collins-Schramm and others, "Markers that Discriminate Between European and African Ancestry Show Limited Variation Within Africa," Human Genetics 111 (2002): 566-9; Mark D. Shriver and others, "Skin Pigmentation, Biogeographical Ancestry, and Admixture Mapping," Human Genetics 112 (2003): 387-99.
- 26. Howells, W.W.1937. The designation of the principle anthropometric landmarks on the head and skull. Am. J. Phy. Anthrop. 22, 477.
- 27. Hrdlicka, 1936. Anthropometry. Am.J.Phy. Anthrop. 21, 287.

New Anthropometry of Human Services; the Method and Practices 251

- Hsiao, H., Halperin, W. E. (1998). Occupational Safety and Human Factors. In William N. Rom (Ed.), Environmental and Occupational Medicine (pp. 923-936). Philadelphia: Raven Publishers.
- 29. Hsiao, H., Long, D., Snyder, K. (2002). Anthropometric differences among occupational groups. Ergonomics, 45(2), 136-152.
- 30. International Encyclopedia of Ergonomics and Human factors(Vol. 1.) cited from www. wikipedia
- 31. Jean-Claude Lemagny. Visionary Architects: Boullée, Ledoux, Lequeu. Hennessey & Ingalls; ISBN 0-940512-35-1; (July 2002)
- 32. John Relethford, The Human Species: An introduction to Biological Anthropology, 5th ed. (New York: McGraw-Hill, 2003).
- Kenneth L. Beals et al. (1984) "Brain Size, Cranial Morphology, Climate, and Time Machines". Current Anthropology, Vol. 25, No. 3 (Jun., 1984), p. 306
- 34. Kevin lan Norton, and Tim okks . 1996. Anthropometrica Textbook of Body measurement for sports and Health Courses by Australian Sports Commission.
- Lewis, Jason E., DeGusta, D., Meyer, M.R., Monge, J.M., Mann, A.E., et al. (2011). "The Mismeasure of Science: Stephen Jay Gould versus Samuel George Morton on Skulls and Bias." PLoS Biol 9(6): e1001071. doi:10.1371/journal.pbio.1001071
- 36. Marks, Jonathan What it means to be 98% Chimpanzee University of California Press, 2002, ISBN 978-0-520-24064-3 pp. 76-77
- 37. Martin, R. and K. Saller, 1957, 1962. Lebrebuch der Anthropologie. Vol. I, II, and III.
- 38. Martin, R.1928. Lehrbuch der Anthropologie Vol. I, II, III. Verlag. Von Custav Fischer. Jena.
- 39. Mazzio, C. (1997). The Body in Parts: Discourses and Anatomies in Early Modern Europe. Routledge. ISBN 0-415-91694-1.
- 40. Michael, J. S. (1988). "A New Look at Morton's Craniological Research." Current Anthropology 29: 349-354.
- 41. Mollison, T. 1938. Spezielle Methoden anthropologischer Messung. Handbuch der biiologischen Arbeisnethoden, Berlin.
- 42. Moran, G.M., M.L. Tilderley, L.H.D. Burton, 1932. Standardization of the technique of physical anthropology. Man, 32, 155.
- Pheasant, Stephen (1986). Bodyspace : anthropometry, ergonomics, and design. London; Philadelphia: Taylor & Francis. ISBN 0-85066-352-0. (A classic review of human body sizes.)
- 44. Philippe Duboy. Lequeu : An Architectural Enigma. MIT Press; ISBN 978-0-262-04086-0 (November 29, 1986)

252 Recent Research and Innovation: An Integrated Approach

- 45. Pierre-André Taguieff, La couleur et le sang Doctrines racistes à la française ("Colour and Blood doctrines à la française"), Paris, Mille et une nuits, 2002, 203 pages, and La Force du préjugé Essai sur le racisme et ses doubles, Tel Gallimard, La Découverte, 1987, 644 pages
- 46. Porter, R. (1997). The Greatest Benefit to Mankind: A Medical History of Humanity from Antiquity to the Present. Harper Collins. ISBN 0-00-215173-1.
- 47. Quetelet, A. 1870. Anthropometrie on la measure dei different faculties d'hemme. Brussel.
- 48. Roberts, D.F. 1991. Trends in Biological Anthropology; The Wheel turns full circle? J. Ind. Anthrop. Soc. Vol. 26, 1 &2, 1-7.
- 49. Roebuck, J. A. (1975). Engineering Anthropometry Methods .Wiley Series Human Factors). John Wiley & Sons Inc.
- Rushton and Ankney. "Brain size and cognitive ability: Correlations with age, sex, social class, arid race". Psychonomic Bulletin & Review, 1996, 3 (1). 21-36.
- 51. Rushton, J. P. "Race, Brain Size, and Intelligence: A Rejoinder to Cain and Vanderwolf". Personality and Individual Differences, 11, 785-794.
- 52. Rushton, J. Philippe. "Cranial capacity related to sex, rank, and race in a stratified random sample of 6,325 U.S. military personnel". Intelligence, Volume 16, Issues 3-4, July-December 1992.
- Rushton, J. Philippe; Ankney, C. Davison (1 January 2009). "Whole Brain Size and General Mental Ability: A Review". International Journal of Neuroscience 119 (5): 692–732. doi:10.1080/00207450802325843.
- 54. Saran, Gopal. 2009. Explorations in method and theories in Anthropology, Rawat Publications, New Delhi.
- 55. Sawday, J. (1996). The Body Emblazoned: Dissection and the Human Body in Renaissance Culture. Routledge. ISBN 0-415-15719-6.
- Schültke, Elisabeth (May. 2009). "Theodor Kocher's craniometer". Neurosurgery (United States) 64 (5): 1001–4; discussion 1004–5. doi:10.1227/01.NEU.0000344003.72056.7F. PMID 19404160.
- Singh, Udai Pratap. 2009. Exploring issues and perspectives of anthropometry; A scientific method of human research. I. J. P. A. & H. G. Vol. 27: 1-2 pp 103-111
- Singh, Udai Pratap, 2013, Looking within and beyond the Conventional windows of Anthropometry; An anthropological journey. The Asian Man;Vol 7:1&2 pp 61-82
- 59. Stewart A. Kinanthropometry and body composition: A natural home for three dimensional photonic scanning. Journal of Sport Science 2010; 28(5): 455–457.

New Anthropometry of Human Services; the Method and Practices 253

- 60. Tanner, James 1998. Brief Bibliography in The Cambridge Encyclopedia of Human Growth and Development; edited by; Staley Ulijasjik, F E Johnston and M A Preece. Cambridge Univ. Press
- 61. Victor R. Preedy. 2012. Handbook of Anthropometry.
- Waldemar, Karwowski, 2006.Intern. Encylo. Of Eronomics and Human Factors. II ed. 3 vol. set. (Baber, Zaheer, 1996. The science of empire: scientific knowledge, civilization, and colonial rule in India. Albany, NY: State University of New York. p. 23.)
- 63. Weiner, J.S. and J.A. Lourie, 1981. Practical Human Biology. Academic Press, London.
- 64. Wilder, Harris, H. 1921. A Laboratory Manual of Anthropometry. P. blakiston's Son & Co. Philadelphia, London.

14 Growing Popularity of Budget Hotels in India

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Abstract

With the strengthening of the middle class economy due to several reasons, the lifestyle patterns of this class of people are changing for the better. The demand for better lifestyle, luxurious goods, comfortable living, weekend outing, eating out is the norm for this class of people. Combined with growing economic wealth, greater freedom, weekend holidays and other leaves, official tours, meetings to attend, this segment is a growing potential for the hospitality industry to tap into. Targeting this section of travellers whether business, leisure travellers or pilgrimage tourist, the budget hotels segment in the country is growing at a fast pace offering first-class quality products, basic comforts, combining luxury and services at reasonable rates.

Considering the vast business opportunities in this market, a heavy investment is being done in this sector by the leading hotel brands, chain operators and even international hotel chains. Government's decision to upgrade/construct regional airports in small towns, privatization & expansion/ new airports in metros like Delhi, Mumbai, Bengaluru, Kolkata etc. and the upgrading of national highways connecting various parts of India has opened new avenues for the development of budget hotels in India.

The only challenge lies in meeting the customer expectations and reasonable pricing for both the parties.

This research paper contains a detailed study on day by day growing demand for budget hotels, their components and fierce competition that has led to several innovative ideas by hotel majors, thereby delivering impressive hospitality products and services.

Keywords: Middle Class, Eating Out, Budget Hotel, Metros, Chain Operators, Hotel Majors

INTRODUCTION

Indian economy is on a high growth trajectory since the past few years. It has created a market demand for luxury products and services by the now affluent middle class who now are in possession of surplus cash flow. This has benefited the tourism industry as this class is now moving out of their home in large numbers. The need for budget hotels in India to cater to the middle income class has always been felt. For this better infrastructure at reasonable rate is required to draw the middle class people towards the budget hotel market.

As the government policies become more favourable towards foreign investors and India continues to receive attention as an emerging market the room supply in the country is expected to increase tremendously. The demand-supply gap of middle-level hotel rooms today is over 100,000 per year, hence there is a great scope in the mid-market and budget segment to accommodate the price-sensitive class.

The strengthening of the middle class in the recent times has seen changes in the lifestyle patterns with demand for better quality services, luxury goods and quality life, trend of eating out, family holidays and demand for other quality services from the hospitality industry. Targeting this vast section of budget travellers whether for business or leisure purposes, the budget hotels segment in our country is growing at a fast pace.

The Government's decision to upgrade regional airports in smaller towns and privatization & expansion of Airports at metros, the upgrading of national highways connecting various parts of India and open sky policies made by the government has opened new avenues for the development of budget and mid-market hotels in the country.

Big players in the Hospitality Industry have entered into the budget and mid-market segment e.g. Trident by Oberoi, Ginger hotels by Taj group; Fortune hotels by Welcome group Hometel Hotels by Sarovar group, Key Hotels by Berggruen Hotels, Choice hotels, Lemon tree hotel, Best western, Peppermint hotels by Royal Orchid Days Inn by Wyndham and many others which at various stages of developments. With focus on comfort minus the unnecessary frills, this budget segment of hotels appeal to a cross-section of guests who are willing to bypass luxuries for price cut.

BUDGET HOTEL VS LUXURY HOTEL

Budget hotels are designed and operated in a manner which is quite different from luxury hotels. These hotels strive for good service, value-for-money pricing, low capital expenditure per room and reduced operation expense (fewer staff, no-frills). The first two factors ensure high utilization (revenues) and the next two drive profitability. Land cost is an important part of capex and varies from location to location. In the same way demand varies with location and season. The tariff is flexible varying with location and season even for hotels of the same brand. In this industry, retaining pricing flexibility is the mantra to manage up and down, the need to keep the price reasonable and drive utilization upward. The key is to retain pricing flexibility, both across locations and seasons. This segment of hotels is largely sharing a place in the popular malls of the metros. The hotels incorporate array of facilities like air conditioned rooms, Md eeting rooms, 24 hour reception, health club, electronic safe deposit boxes in guest room, as well as Wi-Fi connection in all guest rooms.. The hotels also offer restaurant/coffee shop, 24x7 housekeeping services, in house laundry, room service, cable tv, mini-fridge in rooms.. tea/coffee maker etc. incorporated with great service at an reasonable tariff. For the budget-conscious business and leisure traveler these hotels work on the concept of high degree of automation and self-service options. Moreover they believe in standardization of services including hygiene and cleanliness which meets the requirement of domestic and international tourist.

THE MARKET ANALYSIS OF BUDGET HOTELS IN MAJOR CITIES

Due to many restrains only secondary data was used to study the budget hotel market in India.

In **Mumbai** Budget hotels are evenly distributed all around the city. Besides the South Mumbai locations, a good number of hotels in this category are located in areas such as Juhu, Andheri, Bandra, Khar, Navi Mumbai Dadar and Powai. The ARR in the budget category ranges about Rs2500. Corporate discounts offered in this category range from 10-30%,. On an average, 70% of revenue for hotels in the budget category is accounted for by room rent and 30% is generated from F&B activities. There are approximately1150 budget hotels providing reasonable facilities with 3000 new rooms to be added to the total supply of budget hotels in Mumbai by the end of 2025.

Chennai is a stable and steady market where growth of budget hotels is concerned. This city has approx. 4000 budget hotels and is expected to see an addition of 1000 rooms

in the near future. Chennai is the most diversified market in the country with various demand inputs like the IT/ITeS industry, automobile manufacturing base and

Southern India's regional headquarters for many banking companies as well as a medical hub for South India. These demand factors provide a lot of scope for the entrepreneur to invest in this venture.

Delhi-National Capital Region (NCR) Over 50 different hospitality projects developed in the NCR during the Commonwealth Games. The city being the state capital, national capital, tourist destination as well as business hub expects a growth of 100% over its existing supply (20,000 rooms) in the near future. Most of the growth is taking place in the South, West Delhi and NCR Region.

In **Hyderabad** many of the global IT and financial brands are located with more expected to follow. There are several hotels in the budget category which are concentrated in the old CBD of Secunderabad, Begumpet and Lakdikapul close to the railway station and major bus stations. With the commercial base still intact in the old CBD, the budget hotels cater to 75% of the business clientele and pharmaceutical companies which are the major clientele of this segment. The existing inventory of the budget hotels is 1,500 rooms contributing towards about 50% of the total room inventory in the city. Compared to the 5- star and 4-star hotels, the budget hotels manage to maintain a steady ARR of Rs.4, 000 during the past few years.

Jaipur the capital of Rajasthan is expected to do well as a leisure and commercial destination. The number of visitors/tourist is increasing every year. Fortunately, 70% of the growth is expected in the budget to mid-market segments which is an excellent opportunity for the overall tourism potential of the city as well as encouraging more domestic travellers to visit Jaipur as a tourist or business destination.

Kolkata In Kolkata, most of the budget hotels earn a major proportion of their revenue from corporate travellers visiting the city. Generally, these hotels have a clientele base of executives from the pharmaceutical sector, manufacturing, telecom industry as well as the IT/ITES sector. Many of these hotels also have tie-ups with travel portals for getting room bookings.

At present, the budget hotels have ARR of approx. Rs.3, 500 and enjoy an occupancy rate of around 75% during the off-peak season and around 83% during the peak season of Oct-Feb. In Kolkata around 800 rooms are expected to come up in the budget segment by the end of this year.

In **Pune** various category of hotel caters to most of the domestic business travellers from engineering and ancillary services aside from the IT/ITES sector which is the predominant sector of Pune. Of the total number of budget hotels in the city, 70% of the current stock is located in the Central Zone. With improvements in the city's economic scale, this category of hotels has observed a steady growth over the years. The average occupancy rate across this section was around 70% with ARR in the range of Rs.2, 500-3,500. Around 10 new hotel projects are expected to be operational soon adding approximately 800 rooms to the current stock. This supply will be evenly distributed in the three main zones, with the North Eastern, Central and North Western Zones contributing 33%, 42% and 25% respectively.

In **Bangluru** most budget category hotels are located in the city centre and record an average occupancy of 60% all year around. This is primarily due to the presence of serviced apartments in the vicinity which offer competitive rates for long stay durations. At present, these hotels have an ARR of Rs.3000. Hotels operational in the last years include the Confident's Iris at Brigade Road and the Radha Hometel at Whitefield.

THE LEADING BRANDS

Domestic budget hotels are developing in a chain fashion and have begun brand-oriented operations. Almost 10 well-known domestic and international brands are competing for the market share. Over the past few years, leading hotel chains like Ginger, Choice, Sarovar and Hometel are in the phase of rapid expansion and acquisition of major market share. Corporate travellers seeking accommodation for longer durations also prefer budget accommodation with basic amenities and moderate services as compared to the high-end 5 and 4-star hotels.

GINGER BY ROOTS CORPORATION LIMITED

Roots Corporation Limited (RCL) a wholly-owned subsidiary of The Indian Hotels Company Limited (IHCL) came into operation in June 2004. Its smart basic hotels concept created a revolution in the world of Indian hospitality. The first of the Smart Basic hotel was launched in Bangalore and was called indiOne. These hotels have now been launched with a new name - Ginger hotels. Indigenously designed and developed by Indian Hotels Company Limited, the guiding principle behind the design of Ginger Hotels was to create a unique 'space' conducive not only for guest comfort and relaxation but also for their work requirements. The Ginger Hotels are modern, modular and scalable, providing guests with a consistent experience. The hotel has won the best Budget Hotel Chain by the South Asian Travel Tourism Expo (SATTE). These hotels have 100 / 150 well-appointed rooms with a choice of single, twin and queen sized rooms, having presence in more than 20 cities. Ginger Hotel intends to increase the number of hotels to 50 by the beginning of 2025.

HOMETEL BY SAROVAR HOTELS

Sarovar, India's largest hotel chain in the mid-market segment came into existence in January, 2006 and is currently managing 35 properties. Hometel, with its Home Hotel concept by Sarovar Hotels offers Homely Hospitality to all guests round the clock with facilities of Premium & Deluxe Rooms, Guest Houses for Corporates, and elegant exclusive Villas in a gated community with 24 hrs Security, Food Facility, Laundry Services, House Keeping and Cable TV. The hotels under its brand bring fresh designs, concepts and ideas which are vibrant and colorful. They offer very basic features and service at greater value.

KEY HOTELS BY BERGGRUEN HOTELS

New York based Berggruen Hotels, a new hotel venture backed by Berggruen Holdings Inc, has launched Keys, a new brand of Boutique budget hotels in India in July,2009. With an equity capital of \$100 million, Berggruen Hotels intends to build 50 hotels in the next five years in India and is in negotiation for properties in 20 sites. Berggruen Hotels will operate approx. 5000 rooms from its hotels located in convenient locations all over India.

Berggruen Hotels sets aside exclusive floors for lady executives traveling alone on work with exclusive security features. This takes care of female travellers travelling alone for whom hotel stays have always been an issue from the security point of view.

The hotel also offers extra features to the female travellers so as to capture this lucrative market segment.

COUNTRY INNS & SUITES BY CARLSON

Country Inn is a leading brand in the mid-scale hotel segment known for its friendly service that treats all guests like family and properties that make guest feel more like home than a standard hotel. The brand offers a variety of amenities that add comfort and value to each guest's stay such as complimentary hot breakfast, high speed Internet access, and the Read It & Return Lending Library. Country Inns & Suites are located in more than 490 locations in India, America and Europe. The brand is known for its consistently high quality accommodations and personal, warm hospitality.

CHOICE HOTELS

Choice Hotels India is located all over the country from Amritsar to Chennai. They represent the international brands of Comfort, Quality, Ascend Hotel Sleep inn and Clarion. These hotels offer comfortable affordable accommodation with warm, friendly and efficient services. Choice Hotels are part of International hospitality holding corporation which owns several hotel brands and is based in Rockville Maryland, US.

FUTURE DEVELOPMENTS

A combination of unparalleled growth prospect and unlimited business potential, the budget segment hotel business is certain to become a key player in the nation's market. Many international hotel brands are keen to have a presence in India considering the vast market potential. In order to maximize the growing market share, every large domestic budget hotel brand is also focusing on the rapid development of their chain network.

The **Royal orchid** hotels are bringing the India's first exportable brands of hotels, products and services-Peppermint Hotels. Spearheaded by Arjun Baljee, it has been designed to offer the feel good experience of aspirational living and service excellence at value driven prices.

In a bid to enter the vast hospitality market, many leading international budget hotel chains are sizing up plans to make a debut in India. The overseas interest is a reflection of shortage of room supply in the market as well as the existing growth rate of the hospitality industry.

The new budget hotel group Tune Hotels.com will be extending its presence to the Indian market with approx. 70 Tune hotels in the future. The company has entered into a strategic partnership with India's Apodis Hospitality Group to invest, develop and operate a minimum of 20 Tune Hotels across India. They are coming up with the concept, pay-as-you-use system which will also provide an incentive for guests to subscribe to less wasteful, more conscientious lifestyles

The latest in the fray is Royal Indian Raj International Corporation (RIRIC), which has entered into a contract with **Choice Hotels** to build 15,000 budget hotel rooms under the international brands of Comfort, Quality, Sleep Inn and Clarion in the next 5 years with an investment of \$4 billion. Bessemer Partners and New Vernon Private Equity are investing \$44 million, while Warburg Pincus is investing in Lemon Tree and Red Foxx brands of hotels in the country.

Accor is introducing **Formula 1** and **Ibiz brands**. America's **Best Inns** and **Best Value Inn** are also about to enter the Indian market through the franchisee route. Other entrants in this field are MS Crimson, Arora Holdings, Hampshire Hotels and Resorts, Jumeirah, Mandarin, Parsvnath Developers, Dabur Hotels etc.

Premier Inn, the UK's largest hotel chain is also pitching itself as a value-for-money mid-market brand, which plans to build 80

hotels across the country with an investment of over 300 million pounds.

Conclusion

Budget hotels are the future of the hospitality industry. All the hospitality players are targeting the middle class segment which is seen as its biggest clientele. Seeing the vast market to be catered major hotel chains, Indian as well as international is venturing into the field. The main factors determining the future of budget hotels are its market foundation, brand characteristics, capital strength and brand value.

In the long run, the leading budget hotel chains will have to maintain their competitive edge by expanding their market scale by increasing their pace of expansion as well as maintaining the quality of the services, customer needs and the pricing expectations of the ultimate consumer.

Bibliography

- 1. Jata Shankar Tewari, Hotel Front Office, Oxford University Press
- 2. Manoj Yadav, Hotel Front office Management and Operations, Aman Publications
- 3. The Business Line Newspaper,
- 4. Business Daily by The Hindu Group
- 5. The Express Travel world Magazine
- 6. The Economic Times Newspaper
- 7. www.en.m.wikipedia.org
- 8. www.quora.com
- 9. www.tunehotels.com
- 10. www.tripadvisor.in
- 11. www.economictimes.com