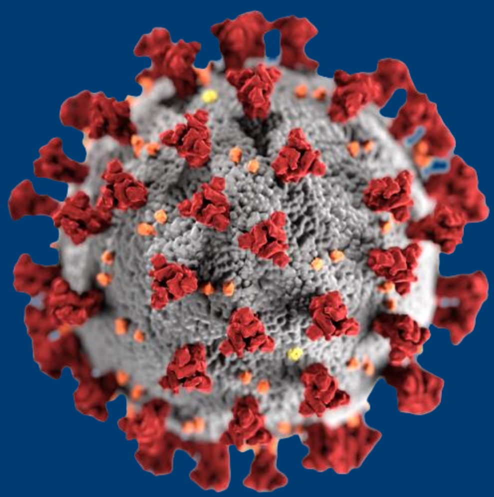
MULTIDISCIPLINARY RESEARCHES DURING COVID ERA

Dr. Rajesh Trehan Dr. Aarti Trehan



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Multidisciplinary Researches During Covid Era

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PREFACE

The COVID-19 pandemic has had a profound effect on the world, and research institutions have certainly felt its impact as well. Institutions of higher learning were either closed or have a very limited in-person activities, thus disrupting research and training. As the world becomes increasingly interconnected, so do the risks we face. The COVID-19 pandemic has not stopped at national borders. It has affected people regardless of nationality, level of education, income or gender. But the same has not been true for its consequences, which have hit the most vulnerable hardest. Education and research are no exceptions. Researchers from privileged backgrounds, supported by their institutions and eager and able to learn, could find their way behind closed doors to alternative learning and training opportunities. Those from disadvantaged backgrounds often remained shut out when their workplaces shut down. Thus:

- *The pandemic has kept away researchers from physical lab spaces, delaying projects by months in some cases.*
- *Social distancing has added to the cost of research projects, forcing institutions to make difficult choices.*
- *The pandemic has made the funding landscape for research more unstable.*

The COVID-19 pandemic has also had a severe impact on higher education as universities closed their premises and countries shut their borders in response to lockdown measures. Although higher education institutions were quick to replace face-to-face lectures with online learning, these closures affected learning and examinations as well as the safety and legal status of international students in their host country. Perhaps most importantly, the crisis raises questions about the value offered by a university education which includes networking and social opportunities as well as educational content. To remain relevant, universities will need to reinvent their learning and research environments so that digitalisation expands and complements student-teacher and other relationships.

Despite all the difficulties and a variety of challenges due to this worldwide pandemic, there was a silver lining of opportunities for innovation and transformation in the research and education. Effective utilization of available and emerging technologies in training and research (webinars, teleconferencing, e-resources, virtual labs & workshops, theoretical modelling etc.) has created an ample window of opportunity for the successful digital transformation of academic environment and practices. Thus, the COVID-19 pandemic has provided us with an opportunity to pave the way for introducing digital learning. Yet, while the coronavirus has brought many challenges to academic research, it has also created opportunities for research to improve moving forward as:

- *Public trust in the work of researchers has increased.*
- *The pandemic has brought a spirit of collaboration to research institutions.*
- *COVID-19 gives institutions a chance to reimagine what's possible moving forward.*

Real change often takes place in deep crises, and this moment holds the possibility that we won't return to the status quo when things return to "normal". While this crisis has deeply disruptive implications, including for research, it does not have predetermined outcomes. It will be the nature of our collective and systemic responses to these disruptions that will determine how we are affected by them. In this sense, the pandemic is also a call to renew the commitment to the Sustainable Development Goals. Ensuring that all young people have the opportunity to succeed and develop the knowledge, skills, attitudes and values that will allow them to contribute to society is at the heart of the global agenda and education's promise to our future society. The current crisis has tested our ability to deal with large-scale disruptions. It is now up to us to build as its legacy a more resilient society.

This edited book aims to provide a comprehensive report on the impact of the COVID-19 pandemic on multidisciplinary research, teaching and learning of various aspects through varied contributed research papers/articles and indicates the way forward.

Our special issue communicates not only different approaches but also narrates the key lessons learnt. We believe that the know-how and the best practices cultivated during the COVID-19 period will lead future interventions in similar circumstances. From this point of view, a continuous quest of resilience and sustainability in research, training and education is of great gain from the pandemic. On the other hand, the psychological aspects and the impact on the behaviour of trainees and trainers, as well as academics and researchers, need to be analysed further. The short-, medium-, and long-term impact of COVID-19 on educational practices and delivery will require more time to be fully understood. Our intention is to promote the scientific debate for the key implications of the modified online mode of delivery as well as the components of strategies and policies that enhance the social values and the social impact of training, education and research. Our intended contribution is multifold:

- To promote recent sound research on effective training, education, and research strategies and methodologies.

- To contribute to the body of knowledge by promoting sound methodological approaches for effective training, education, and research in COVID-19 times.
- To communicate best practices and key lessons learned related to training, education, and research in the COVID-19 period.
- To invite relevant scientific debate from diverse communities from different domains of human activity including medical training and research, business training and education, information systems and computer sciences education.

The pandemic gives us a chance to improve how we respond to challenges going forward. We have an opportunity to reset completely. That's very attractive. Finally, navigating through the tough COVID-19 challenges was exhausting, but perseverance, hope and foresight will eventually make us stronger and more agile.

Though every effort has been made to make the book error free, yet the readers might encounter some errors and their criticism with suggestions are always welcome. The contributors are solely responsible for the contents of the papers/articles compiled in this edited book. Responsibility of authenticity of the work or the concepts/views presented by them through this book shall lie with them and the editors has no role or claim or any responsibility in this regard. Any other suggestions for improvement in this book are also welcome.

Our thanks to Empyreal Publishing House, for their cooperation and bringing out this book in short time.

Dr. Rajesh Trehan

Dr. Aarti Trehan

ACKNOWLEDGEMENT

We express our heartfelt gratitude to **Goddess Saraswati** for lighting our path during the journey of editing this book. We most gratefully acknowledge the help of many sources in the preparation of this book. It is impossible to mention all of them, as every book on the subject that we have read has left its impression upon our memory. We express our gratitude to all our colleagues, friends and students who inspired us to indite this book and for their valuable encouragement.

In this book, various researchers, academicians, teachers and scholars have written their papers/articles during the tough time of Covid era. We appreciate all the contributors from different parts of the globe for their scholarly contribution in giving the shape to this book.

We remember with love and devotion our sons Lohitaksh and Neelaksh who stood by us during preparation of this book. We admire the blessings and sweet memories of our parents for guiding us during the present work and always. All those who devoted every moment to serve others in the tough period of Covid, deserve our appreciation. Additionally, special thanks to our cute cats and kittens, for cheering up our mood.

We express our immense gratitude to Empyreal Publishing House for publishing this book in time. We appreciate your commitment and fast response in publishing this book.

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E – LEARNING: A TOOL FOR SUSTAINABLE EDUCATION DURING COVID ERA

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ABSTRACT

The Global pandemic COVID 19 has brought forth amongst society, the most unprecedented challenging times seen by mankind till now. One of the most severely impacted area, has undoubtedly been the area of education. The lockdown, resulting due to the pandemic created a sudden requirement to use technology to carry on educational activities uninterrupted, so that students do not suffer any academic losses due to closure of all educational institutions. Educational Technology came as big force in this situation of crisis management. Digital adoption became the chief or rather only solution to handle the crisis and deliver education to students who were now sitting in their homes. The role of technology in the educational sector is increasing at a phenomenal rate and has revolutionized traditional forms of teaching-learning processes. One of the important technological innovations is E-learning which may be described as the application of broad band, internet and computers to assist teaching and learning. Many E-learning tools like blogs, wikis and software are currently available to use in education. E-learning tools can provide training and education to a large number of students with diverse socio- cultural backgrounds and educational levels.

MOOCs i.e., Massive Open Online courses, at present have been one of the trendiest approaches of teaching online specially during Covid Era. One of the attractions of a MOOC is the idea of sharing knowledge with a large worldwide audience no charge in online environment. The main game changers are a type of institutions or universities offering such courses, like for e.g., IGNOU being one of the prominent ones. There are various factors for the exponentially increasing popularity of MOOCs. Some of the most important ones are the format and pedagogical base. In this connection, the MOOC phenomenon created a networked milieu designed within the context of E-learning that has not only been providing educational equality, but has also been meeting the demands of higher education in a wider scale. Moreover, MOOCs offer a diverse community of participants the opportunity to share ideas and get deeply involved in the subject via a rich variety of synchronous and asynchronous online activities. The online format allows learners to explore dozens, yet hundreds of contributions by other course participants, which often leads to further inspiration for their own work in creative assignments.

This chapter aims to give an overview of the role of E-Learning towards achieving sustainable development in the field of education in the current times of technological advancement and development seen specially during Covid Era.

It is structured in two parts namely- E-Learning and MOOCs for discussion of main points under each heading.

Key Words: E- Learning, Sustainable education, Covid Era, Technological development, MOOCs.

INTRODUCTION

1. CONCEPT OF E- LEARNING

Technology has become a necessity in school/college/university classrooms during Covid times. Using a technology imparts lecturers the diversity of their lectures, displaying more information, and enhancing student learning. In addition, the use of different technologies in the classroom can help lecturers to save time and allow for more attention to be paid to the content of course.

Numerous researchers have identified that **education for sustainable development** requires the building of the following skills-

1. Skills in systems thinking
2. Critical thinking
3. Future thinking
4. Visioning
5. Problem solving and
6. Participatory decision-making

In the beginning of the third millennium, a new form of learning called E-Learning is being introduced. **E-learning** is the act of engaging in an educational course in an online setting. Commonly used in organizations like schools/colleges and corporations, E-Learning can help learners to complete their education and training objectives with greater ease and flexibility than they can with traditional classroom-based learning. The E-Learning decreases the educational costs and is more effective than traditional learning. Globally, it allows the fast dissemination of new techniques and processes, canceling geographic challenges. In addition, time efficiency plays a role, as travel is reduced. Users can conveniently access training materials from home or while on the road via the internet. Unlike the traditional classroom setting at a university, participants from all over the world, at any age and with different interests, abilities and backgrounds can enroll in an online course. Some of the most frequently used E Learning Websites preferred by students are:

- Khan Academy
- Coursera
- W3 Schools
- Ted Ed
- Academic Earth

Many E-Learning tools like blogs, wikis and software are currently available for using in education. E-Learning tools can provide training and education to large number of students with diverse cultural backgrounds and educational levels. Indira Gandhi National Open University known as *IGNOU,* is a Central University located at Maidan Garhi, New Delhi, India. It also aims to encourage, coordinate and set standards for distance and open education in India, and to strengthen the human resources of India through education.

CHALLENGES TO E- LEARNING

1. Achieving sustainable development is, without a doubt, the single most critical challenge necessary to ensure the wellbeing of our world and its people. The challenge is to fully exploit electronic media, maximizing its usefulness and the realm of possible resources; E-Learning must not be Power Point presentations modified into online modules, but rather well-designed training that draws on the best electronic resources available.
2. There are no easy solutions. There is, however, a considerable amount of consensus that the most successful approach will involve two key elements. The first of these is education.

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More people at all levels must be empowered to develop the values, attitudes and skills necessary to change behavior in regard to natural resource management. The second component is greater collaboration among key entities working to make a difference. Change cannot be brought about by any single organization - no matter how large or well resourced.

3. Extension agents will continue to play a critical role in agricultural extension, bridging the gap between E-Learning methods and implementation in the field.

2. CONCEPT OF MOOCS

The term **"Massive Open Online Courses (MOOCs)"** was first used by Dave Cormier in 2008 to define "Connectivism and Connective Knowledge" course. (Yuan & Powell, 2013). A massive open online course is an online course aimed at unlimited participation and open access via the web. MOOCs are a recent and widely researched development in distance education, first introduced in 2006 and emerged as a popular mode of learning in 2012. Based upon the given numbers, it may be observed that MOOCs can be regarded as one of the trendiest approaches to teach online during the pandemic, and provide equal scope for learners of higher education. One of the attractions of a MOOC is the idea of sharing knowledge with a large worldwide audience free of charge through an internet connection. Another major potential game-changer is the type of institutions offering courses. This fact may indicate that MOOCs have already become a part of education and/or they are no longer 'on the horizon', and simply part of doing business. Historically, the adjectives "anytime, anywhere" have been attributed to the benefits of accessing the internet.

The MOOCs created a networked milieu designed within the context of distance E-Learning and potential engagement. In this connection, MOOCs have not only been providing equality in educational opportunities during Covid, but may have also been meeting the demands of higher education in a wider scale. There are some, who believe that MOOCs could be the most effective tools to facilitate the outreach of higher education among the masses during this pandemic.

TYPES OF MOOCs

There are several types of MOOCs, as they have quickly morphed into specific subsets, which address targeted needs of learners.

Some of the sub-MOOCs include

1. c MOOC
2. x MOOC
3. Hybrid MOOC
4. Mobi MOOC
5. Synchronous
6. Asynchronous

Furthermore, studying in a MOOC is a combination of synchronous and asynchronous activities in the online format. Synchronous refers to a set time (phone/Internet classroom sessions). Synchronous

E- Learning is also called as real-time learning. Asynchronous refers to student directed, self-paced learning. Asynchronous E-learning is pause-and-resume kind of learning. This gives participants the ability to receive input from the teacher in the course, reflect on the topic at

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different places and times and interact with the course community subsequently. Depending on the pedagogical design of the online course and the platform features, one can substantially increase participants' innovation and creative outputs by simply enabling them to unleash their creative potential. The constant availability makes MOOCs an excellent resource not only for students, but also for all life-long learners and modern professionals striving for on-going career development and personal improvement. MOOCs have always been a great format to exchange ideas among participants, to study and develop creative processes and foster innovation. This is due to several factors, including the fact that participants in Massive Open Online Courses are usually very diverse. The fact that these courses are provided for free or at low prices which is their other big advantage, enables both people with no formal education and those with a degree from a higher education institution to be able to embrace the opportunities.

ADVANTAGES OF MOOCs

There are three main strengths of any web-based course management system. These are:

1. accessibility of course resources to students
2. timely communication between lecturers and trainees
3. reduced paper usage (paperless systems).

There are a number of advantages for using technology and learning materials in the form of MOOCS in the university classroom. Few of the important advantages are:

1. More active learning
2. Diversified teaching ways
3. Better student attention and realization
4. Less time for lecturers/classes
5. Visual stimulation
6. MOOCs could break the boundaries of traditional learning.
7. Providing access to non-traditional learners, as well as those bound by financial constraints.

DISADVANTAGES OF MOOCs

1. Equipment failures
2. The need for backup plans and guidelines
3. Anxiety for lecturers
4. Extra time spent for learning new technologies and new skills
5. The researchers believe the reasons for the high dropout rate is there are no live instructors
6. No straight-and-narrow path from beginning-to-end
7. The formats do not always encourage the exchange of different thoughts and ideas among learners.

CONCLUSION

The global crisis seen during the Covid Era, has forced all stakeholders of the field of Education, to adapt to a new norm and so it has been a catalyst for a positive change. One thing is very clear E-Learning is the future with the right mix of offline and online education. The concept of continuous uninterrupted learning has truly evolved because of online teaching-learning.

1. E-Learning is considered to be better than traditional classroom learning. Executing cooperative learning is limited in time and place. However, the collaborative learning activities, such as knowledge articulation, explanations, argumentation and other demanding epistemic activities can be supported in different ways using communication tools and shared workspaces in E-Learning environments.
2. The challenge is to fully exploit electronic media, maximizing its usefulness and the realm of possible resources; E-Learning must not be power point presentations modified into online modules, but rather well-designed training that draws on the best electronic resources available.
3. In general, educational reforms have been moving two steps forward, three steps backward for many decades. The idea of a MOOCs is definitely not the magic bullet to resolve all educational concerns, however, perhaps it could provide sufficient disruption to encourage a broad range of educational stakeholders to initiate and sustain conversations, which may take us on a different path. However, one of the main challenges that should be taken in account, is that the current E-Learning systems face some security issues because if security is not integrated into the E-Learning development process. This area will surely become an area of interest for several future researches in the Covid Era.

REFERENCES

1. https://bizmooc.eu/papers/innovation-moocs/
2. https://www.scribd.com/document/398379348/session16Aljawarneh-pdf
3. https://pdfs.semanticscholar.org/9dea/7d41a2d7b2ac0642cc0422831053b73438bc.pdf
4. Mugimua, C.B. (2010). Developing and Using Open Education Resources to Support Teacher Education in Africa. Excellence in Higher Education p 1,31-45.
5. https://www.researchgate.net/publication/280570999_EDUCATIONAL_INNOVATION_IN_E-LEARNING_MOOCs_and_OER_Movements_in_Turkey

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MARGINALIZATION AND CRIME AGAINST WOMEN IN INDIA IN THE POST-REFORM PERIOD

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ABSTRACT
Women face gross discrimination and inequality in India. The patriarchal norms of the society treat women unequally to men. The societal set up is such that women are not properly educated, married off at young ages, burdened with domestic responsibilities and refrained from pursuing education & employment, eventually getting marginalized. Marginalization leads to vulnerability which sooner or later leads to crime and other mal-practices. The capacity of economic empowerment of women in diminishing the proportion of crimes committed against them cannot be undermined. In spite of rapid economic growth in India since the reforms of 1991, the benefits of expeditious growth could not trickle down to women in the spheres of education, employment and health, thus, contributing to rising crime against women in the country.

JEL CLASSIFICATION: I15, I24, J21, J11

KEYWORDS: Women, Crime, India, Post- reform period, Literacy Rate, Sex- ratio, Labour Force, Female Labour Force, Employment, Agriculture, Industry, Services.

1. INTRODUCTION
Women are the victims of endless centuries of discrimination and exploitation in the deeply rooted patriarchal society of India. From the beginning of life itself women are being discriminated against men as revealed by the status of sex- ratio in India which declined since the beginning of 1901 and could retrieve itself only with the dawn of new century as can be seen in Table 1. Female foeticide, female infanticide etc. are some possible explanations for the declining sex ratio in India but a closer look reveals the story behind these figures. Females occupy secondary status in the society dominated by men in India both within the households and at workplaces (Qazi, 2017). The burden of poverty is heavier on women as compared to men and till date, women still receive 34 per cent lesser wages than men for the same work (Bhattacharya, 2019).

Table 1: Sex Ratio in India (1901-2011)

Census Year	Sex Ratio
1901	972
1911	964
1921	955
1931	950
1941	945
1951	946
1961	941
1971	930
1981	934
1991	927
2001	933
2011	940
Source: censusindia.gov.in	

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Women are married at young ages in India and quickly become mothers which affects their health, financial independence, education and employment opportunities. Triggered by the traditional societal set- up, the burden of household responsibilities like cooking, cleaning, fetching water and firewood, which constitutes the unpaid work, falls disproportionately on the shoulders of women (Sanghera, 2019). The immense pressure of unpaid domestic work acts as a deterrent for women to pursue education and paid- employment, ultimately denying them of economic independence and leading them to a vicious circle of poverty and marginalization. Being marginalized, women become an easy scapegoat to various crimes committed against them. The economic reforms of 1991 brought an era of unprecedented economic growth and new opportunities in the country with the introduction of the policies of Liberalisation, Globalization and Privatisation but the process of growth seems to have by- passed women in India.

Himabindu, Arora & Prashanth (2014) have related the rising crimes against women to the vulnerability and deep- rooted problems related to the position of women in Indian society. In their study they have bought out the issue of gender inequality in the field of education and work- participation as one of the reasons behind rising crimes against women. Kabeer (2014) highlighted gender inequality in economic opportunities and economic resources as reasons behind vulnerability and rising violence against women. United Nations (2018) asserted that lack of economic empowerment and denial of economic rights to women is the reason behind rising violence and crimes committed against them. Bolis and Hughes (2015) found that economic empowerment will lead to decline in domestic violence against women.

On the same note, this paper is a modest attempt to highlight the relationship between marginalization of women in India and growth of crime against them in the post- reform (after 1991) period.

2. PURPOSE OF THE STUDY

The study has been undertaken with a view to fulfill the following objectives:

1. To evaluate the growth of crimes committed against women in India in the post- reform period (1991-2018).
2. To analyse the educational attainment, employment level and health status of women in India in the post- reform period (1991- 2018).
3. To understand the growth of crimes committed against women in India in light of their educational, employment and health status.

3. ANALYTICAL FRAMEWORK

The present study is based on secondary data only. Data sources for the present study are: Reports of National Crime Records Bureau, India, Various Census reports of India, World Bank database, UNESCO Institute for Statistics, ILOSTAT database, Global Database on Child Growth and Malnutrition etc.

Crime against women in India has been defined as sum total of incidence of IPC (Indian Penal Code) crimes and SLL (Special & Local Laws) crimes committed against women in the country.

Literacy Rate for persons aged 15 years and above has been used to determine educational attainment; share of female labour force, employment in agriculture, industry and services has been used to ascertain the Employment level and prevalence of stunting and underweight among female children has been used to detect the health status of women in India.

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The time-period of the study is 1991 to 2018. For some indicators data for all the years was not available. For such indicators, the study made use of maximum possible data available.

In order to calculate the growth, exponential regression model (Gujarati & Sangeetha, 2007, p. 179; Gupta, 1969, p. 623) has been fitted which is given below:

$$Y_i = \beta_1 X_i^{\beta_2} e^{u_i} \qquad \dots\dots\dots\dots\dots\dots\dots \ (1)$$

which can alternatively be written as:

$$LogY_i = Log\beta_1 + \beta_2 LogX_i + u_i \qquad \dots\dots\dots\dots\dots\dots\dots.... \ (2)$$

Where,

Y_i is the dependent variable

X_i is the independent variable

β_1 and β_2 are the unknown parameters

u_i is the error term

By applying OLS method (Gujarati & Sangeetha, 2007, p. 64) estimated values of β_1 and β_2 denoted by $\hat{\beta}_1$ and $\hat{\beta}_2$ has been calculated.

CAGR (Gr_c) has been computed by taking antilog of the estimated regression coefficient of β_2 , subtracting 1 from it and thereafter, multiplying it by 100

$$Gr_c = Anti\log(\hat{\beta}_2 - 1) \times 100 \qquad \dots\dots\dots\dots\dots\dots\dots\dots. \ (3)$$

Since $\hat{\beta}_2$ is the estimated regression coefficient of β_2.

In order to check the significance of growth rate, the study made use of Student's 't'- test (Gujarati & Sangeetha, 2007, p. 137).

$$t = \frac{\hat{\beta}_2}{S(\hat{\beta}_2)} \sim t(n-2)d.f. \qquad \dots\dots\dots\dots\dots\dots\dots\dots\dots \ (4)$$

Where $d.f.$ refers to degrees of freedom and $S(\hat{\beta}_2)$ refers to the standard error of $\hat{\beta}_2$.

Year-to-year growth fluctuations have been captured as:

$$G_t = \frac{Y_t - Y_{t-1}}{Y_{t-1}} \times 100 \qquad \dots\dots\dots\dots\dots\dots\dots\dots. \ (5)$$

Here G_t = Year-to-year growth rate

Y_t = Value of Y- variable in current year

Y_{t-1} = Value of Y- variable during the last year

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4. RESULTS AND DISCUSSION

The results and discussion of the study are as follows:

4.1 Growth of Crime against women in India

Sub- section 4.1 demonstrates the growth of crime against women in India in the post- reform period (1991- 2018) which is discussed as below:

Table 2: Crime against women in India

Year	Crime against women in India (IPC+SLL)	Year- to- year Growth Rate (in per cent)
1991	74093	
1992	79037	6.67
1993	83954	6.22
1994	98948	17.86
1995	109259	10.42
1996	115723	5.92
1997	121265	4.79
1998	131475	8.42
1999	135771	3.27
2000	141373	4.13
2001	143795	1.7
2002	143034	-0.5
2003	140601	-1.7
2004	154333	9.77
2005	155553	0.79
2006	164765	5.92
2007	185312	12.47
2008	195856	5.69
2009	203804	4.06
2010	213585	4.8
2011	228650	7.05
2012	244270	6.83
2013	309546	26.72
2014	339457	9.66
2015	329243	-3
2016	338954	2.95
2017	359849	6.16
2018	378277	5.12
Compound Annual Growth Rate		5.8
Sig. value		.000*

Note: * indicates significant at 5 per cent level of significance.

Source: Crime in India (Various issues), National Crime Records Bureau, India.

Table 2 depicts total cognizable crimes committed against women in India from 1991 to 2018. It must be noted here that the total crimes comprise of IPC (Indian Penal Code) crimes and SLL (Special & Local Laws) crimes committed against women. It can be seen that in 1991, a total of 74093 crimes were committed against women which grew at approximately 6 per cent for the next two years reaching to 83954 in 1993. With a total of 98948, the next year (1994) saw a rise of crimes committed against women in India by 17.86 per cent which declined to 10.42 per cent in 1995. The growth of crimes against women declined for the next two years and in 1998 again it increased by 8.42 per cent. Thereafter, crimes committed against women in India fell consistently till 2003 with the growth of crimes becoming negative in the years 2002 and 2003. In 2004, crimes committed against women in India increased by 9.77 per cent reaching at 154333 crimes. Showing no consistent pattern for the following years, the total crimes committed against women in India stood at 378277 in 2018. Crimes against women in India have grown at CAGR (Compound Annual Growth rate) of 5.8 per cent from 1991 to 2018 and the CAGR is found significant at 5 percent level of significance.

4.2 Education, Employment and Health status of women in India

Sub- section 4.2 covers the education, employment and health status of women in India which is described as below:

i) Educational Attainment

The educational attainment of women in India is described through gender-wise classification of literacy rate in India of persons aged 15 years and above.

Table 3: Literacy Rate in India (Persons aged 15 years and above)

Year	Literacy rate, adult female (percentage of females aged 15 and above)	Literacy rate, adult male (percentage of males aged 15 and above)
1991	33.73	61.64
2001	47.84	73.41
2006	50.82	75.19
2011	59.28	78.88
2018	65.79	82.37

Source: UNESCO Institute for Statistics.

"Literacy and level of education are basic indicators of the level of development achieved by a society. Spread of literacy is generally associated with important traits of modern civilization such as modernization, urbanization, industrialization, communication and commerce." (censusindia.gov.in). Table 3 elaborates the gender-wise status of literacy rate[*] in India after 1991 at five time- points namely: 1991, 2001, 2006, 2011 and 2018. In 1991, 33.73 per cent females were literate in India as compared to 61.64 per cent males. The literacy rate of both males and females increased overtime however, the literacy rate of females almost doubled in 2018 (65.79 per cent) as compared to its 1991 levels. The literacy rate of males in 2018 stood at 82.37 per cent.

Being almost doubled in 2018 (65.79 per cent) as compared to 1991 (33.73 per cent), female literacy rate showed a relatively better performance, but still remained behind male literacy rate even in 2018 (82.37 per cent).

[*] "Adult literacy rate is the percentage of people ages 15 and above who can both read and write with understanding a short simple statement about their everyday life." (UNESCO Institute for Statistics).

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ii) Employment Level

Employment level of women in India has been elaborated through the share of Female Labour force in Total Labour Force (1991- 2018) and gender- wise classification of employment in agriculture, industry and service sector in India.

Table 4: Female Labour Force in India (1991- 2019)

Year	Total Labour Force	Labour Force (Female)
1991	325025127	81477612 (25.07)
1992	332692256	83673819 (25.15)
1993	340758079	86080195 (25.26)
1994	349350954	88759658 (25.41)
1995	357002475	90790634 (25.43)
1996	364438601	92779484 (25.46)
1997	372138548	94835473 (25.48)
1998	380076547	96955159 (25.51)
1999	388214321	99129172 (25.53)
2000	396512424	101350815 (25.56)
2001	406948124	104858494 (25.57)
2002	417726506	108506219 (25.97)
2003	428791387	112273492 (26.18)
2004	440082586	116139944 (26.39)
2005	451555845	120096141 (26.6)
2006	453694481	117416308 (25.88)
2007	455807544	114713816 (25.17)
2008	457869614	111989235 (24.46)
2009	459908336	109261690 (23.76)
2010	461934938	106542786 (23.06)
2011	462578948	102484715 (22.15)
2012	463448734	98559624 (21.27)
2013	472354936	101163744 (21.42)
2014	481086348	103769570 (21.57)
2015	489465316	106311870 (21.72)
2016	497650374	108942679 (21.89)
2017	505288647	111429017 (22.05)
2018	512348470	112319851 (21.92)
Compound Annual Growth Rate		0.9
Sig. value		.000*

Note: 1) * indicates significant at 5 per cent level of significance.

2) Figures in parentheses represent female labour force as percentage of total labour force.

Table 4 sketches out Female Labour Force employed in India from 1991 to 2018. A total of 81477612 females were employed in India in the year 1991 which increased to 104858494 in 2001, to 102484715 in 2011 and to 112319851 in 2018. Female Labour Force as percentage of Total Labour Force was 25.07 per cent in 1991 which increased marginally year by year till 2006. Thereafter, it started declining and in 2018, Female Labour force comprised 21.92 per cent share of the Total Labour Force. CAGR of Female Labour Force in India is 0.9 per cent and it is found significant at 5 per cent level of significance.

Table 5: Employment in Agriculture in India (1991-2018)

Year	Employment in agriculture, female (as percentage of female employment) (modeled ILO estimate)	Employment in agriculture, male (as percentage of male employment) (modeled ILO estimate)
1991	76.28	58.61
1992	76.1	58.31
1993	75.76	57.99
1994	75.46	57.65
1995	75.23	57.16
1996	75.08	56.76
1997	74.96	56.31
1998	74.79	55.79
1999	74.42	54.93
2000	74.38	54.55
2001	73.9	53.86
2002	73.43	53.16
2003	72.82	52.3
2004	72.11	51.18
2005	71.43	50.22
2006	70.4	49.53
2007	69.23	48.73
2008	68.21	48.22
2009	66.98	47.52
2010	65.61	46.72
2011	62.78	45.05
2012	59.97	43.53
2013	59.58	43.09
2014	59.09	42.52
2015	58.59	41.97
2016	58.16	41.49
2017	57.62	40.83
2018	57.06	40.17

Source: International Labour Organisation, ILOSTAT database.

Table 5 delineates the employment[*] of females and males in agricultural sector[*] in India as percentage of total female and male employment. Agricultural sector is the largest employer of

[*] "Employment is defined as persons of working age who were engaged in any activity to produce goods or provide services for pay or profit, whether at work during the reference period or not at work due to temporary absence from a job, or to working-time arrangement." (ILOSTAT database).

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women in India (Swamikannan & Jayalakshmi, 2015) and the work participation of women in rural areas is more as compared to men (Kumar & Dixit, 2016). In parity with these facts, 76.28 percent women were employed in the agricultural sector in 1991 as compared to 58.61 percent men. As a country develops, the proportion of its population dependent upon the agricultural sector declines and the proportion of its population dependent upon industrial and services sector increases (ourworldindata.org). India embarked on a path of development after liberalisation and the proportion of its population dependent upon the agricultural sector declined while the proportion of its population dependent upon industrial and secondary sector increased (ibef.org) with the result that in 2018, 57.06 percent females and 40.17 percent males were employed in the agricultural sector.

The proportion of population (both males and females) dependent upon agricultural sector declined after 1991 but, till date, more females are employed in the agricultural sector as compared to males.

Table 6: Employment in Industry in India (1991-2018)

Year	Employment in industry, female (as percentage of female employment) (modeled ILO estimate)	Employment in industry, male (as percentage of male employment) (modeled ILO estimate)
1991	11.63	16.53
1992	11.64	16.61
1993	11.63	16.61
1994	11.65	16.71
1995	11.64	16.9
1996	11.63	17.13
1997	11.65	17.33
1998	11.65	17.53
1999	11.66	17.79
2000	11.66	17.93
2001	12.07	18.27
2002	12.52	18.63
2003	13	19.17
2004	13.61	20.08
2005	14.13	20.71
2006	14.68	21.37
2007	15.34	22.15
2008	15.99	22.57
2009	16.72	23.12
2010	17.57	23.81
2011	18.25	25

[*] "The agriculture sector consists of activities in agriculture, hunting, forestry and fishing, in accordance with division 1 (ISIC 2) or categories A-B (ISIC 3) or category A (ISIC 4)." (ILOSTAT database).

2012	18.77	25.85
2013	18.74	25.89
2014	18.72	25.92
2015	18.67	25.9
2016	18.61	25.87
2017	18.69	26.1
2018	18.75	26.34

Source: International Labour Organisation, ILOSTAT database.

Table 6 shows female and male employment in industrial sector* of Indian economy as percentage of total female and male employment. In 1991, 11.63 percent females were employed in industry as compared to 16.53 percent males. Hence, at the very beginning of the study- period more males were employed in industry as compared to females. In consonance with the structural transformation of the economy, the proportion of both men and women employed in industrial sector of the economy grew over a period of time and in 2018, 18.75 percent females were employed in the industrial sector as compared to 26.34 per cent males.

The share of women employed in the industrial sector of Indian economy has grown up after 1991 but still more males are employed in this sector as compared to females.

Table 7: Employment in Services in India (1991-2018)

Year	Employment in services, female (as percentage of female employment) (modeled ILO estimate)	Employment in services, male (as percentage of male employment) (modeled ILO estimate)
1991	12.09	24.86
1992	12.33	25.08
1993	12.6	25.4
1994	12.89	25.64
1995	13.13	25.94
1996	13.28	26.1
1997	13.38	26.37
1998	13.55	26.67
1999	13.92	27.28
2000	13.96	27.52
2001	14.02	27.87
2002	14.05	28.21
2003	14.17	28.53
2004	14.28	28.73
2005	14.44	29.06
2006	14.92	29.1
2007	15.42	29.12
2008	15.79	29.21

* "The industry sector consists of mining and quarrying, manufacturing, construction, and public utilities (electricity, gas, and water), in accordance with divisions 2-5 (ISIC 2) or categories C-F (ISIC 3) or categories B-F (ISIC 4)." (ILOSTAT database).

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2009	16.3	29.36
2010	16.82	29.47
2011	18.95	29.94
2012	21.26	30.62
2013	21.68	31.03
2014	22.19	31.56
2015	22.74	32.13
2016	23.22	32.64
2017	23.69	33.06
2018	24.19	33.48

Source: International Labour Organisation, ILOSTAT database.

Table 7 portrays the female and male employment in services sector* in India as a percentage of total female and male employment respectively. In 1991, 12.09 percent women were employed in services sector. The proportion of women employed in this sector grew up overtime and was 13.96 per cent in 2000. In a span of 18 years, the employment of women in services sector of Indian economy almost doubled and stood at 24.19 per cent in 2018. However, the share of females in this sector too was lesser than males at the very outset and continued to be so towards the end of study period also. In 1991, 24.86 percent were males employed in services sector which increased to 33.48 percent in 2018.

So, the proportion of females in the services sector of India increased over a period of time after 1991 but still remained behind the proportion of males in this sector.

iii) Health Status

Health status of women in the country has been described through prevalence of stunting and under- weight among female children (less than 5 years of age) in India.

Table 8: Prevalence of stunting among female children

Year	Prevalence of stunting, height for age, female (% of children under 5) in India	Prevalence of stunting, height for age, female (% of children under 5) in Bangladesh
	55.7	74.6
1999	50.9	60.7
2006	48	46.6
2014	37.9	35.9

Source: World Health Organization, Global Database on Child Growth and Malnutrition as quoted in World Bank Indicators, 2019.

Table 8 depicts the prevalence of stunting among female children less than 5 years of age in the post- reform period in India and Bangladesh, at four points of time namely: 1992, 1999, 2006 and 2014. "Prevalence of stunting in female, is the percentage of girls under age 5 whose height for age is more than two standard deviations below the median for the international reference population ages 0-59 months. For children up to two years old height is measured by recumbent

* "The services sector consists of wholesale and retail trade and restaurants and hotels; transport, storage, and communications; financing, insurance, real estate, and business services; and community, social, and personal services, in accordance with divisions 6-9 (ISIC 2) or categories G-Q (ISIC 3) or categories G-U (ISIC 4)." (ILOSTAT database).

length. For older children height is measured by stature while standing." (www.who.int). 55.7 per cent female children less than 5 years of age were stunted in the year 1992. The proportion declined to 50.9 in 1999, 48 in 2006 and 37.9 in 2014. From 1992 to 2014, stunting among female children recorded a decline of 17.8 percentage points and could be interpreted as the success story of India in the decline of stunting among female children in India. However, it must be noted that even countries, with lesser HDI rankings, like Bangladesh performed better over the time as compared to India with 74.6 per cent stunted female children in 1992 which declined to 35.9 per cent in 2014. Not only the proportion of female stunted children in Bangladesh was lesser than India in 2014, but the country also delivered better over the time performance.

Table 9: Prevalence of underweight female children in India

Year	Prevalence of underweight, weight for age, female (percentage of children under 5 years of age)
1992	48.8
1999	43.8
2006	43.9
2014	28.7

Source: World Health Organization, Global Database on Child Growth and Malnutrition as quoted in World Bank Indicators, 2019.

Table 9 represents the prevalence of under-weight among female children in India, less than 5 years of age, in the post- reform period, at four points of time namely: 1992, 1999, 2006 and 2014. "Prevalence of underweight, female, is the percentage of girls under age 5 whose weight for age is more than two standard deviations below the median for the international reference population ages 0-59 months" (www.who.int). In 1992, 48.8 per cent girls out of total girls in India under 5 years of age were under- weight. The proportion of under- weight girls reduced to 43.8 per cent in 1999 which increased marginally to 43.9 per cent in 2006. Though, the share of under- weight girls in India declined drastically to 28.7 per cent in 2014, indicative of the steps taken by government to improve the health status of female children in India like National Rural Health Mission, National Urban Health Mission, Pradhan Mantri Matritva Vandana Yojana etc., but, still the proportion of under- weight girls in India remains high and try to offer any real solace.

5. GROWTH OF CRIME AND EDUCATIONAL, EMPLOYMENT & HEALTH STATUS OF WOMEN IN INDIA IN THE POST- REFORM PERIOD (1991- 2018)

Post- reform period (1991-2018) has been termed as a period of economic growth for India. It was during this period that the country was finally able to recover itself from the Hindu rate of growth of 3.5 per cent. However, women were not able to avail the benefits of growth process and were left behind on various economic fronts. It can be seen in Table 3 that though the gap in literacy- rate between men and women was reduced in the post- reform period, still, even in 2018, 65.79 percent women were literate as compared to 82.37 percent women. In the beginning of the post- reform period, in 1991, females constituted 25.07 percent of the total Labour Force however, at present they constitute only 21.92 percent of the total Labour Force. Female Labour Force grew, merely, at 0.9 percent between the years 1991 to 2018. The employment of women in the agricultural sector was more than men in 1991 and continued to be so in 2018 also. However, it must be noted that more employment of women in agriculture and allied activities in developing countries like India is an indicator of under- development. In case of industry and services, lesser women as compared to men were employed in 1991 and continued to be so in 2018 also. Prevalence of stunting among female children in India declined from 55.7 percent in 1992 to 37.9 percent in 2014 but the performance of countries like Bangladesh was better than India where the figures declined from 74.6 percent in 1992 to 35.9 percent in 2014. In case of prevalence of underweight among female children less than 5 years of age in India 28.7 percent female children were found to be underweight in 2014. So, it can be said that women were left out on all major economic fronts i. e. educational attainment, employment level and health status in the post- reform period and were marginalized in the growth process. However, during 1991 to 2018, crime against women in India grew at 5.8 percent per annum indicative of the vulnerability and deteriorating status of women in the society.

6. CONCLUSION

Being left out on all the major economic fronts viz. educational attainment, employment level and health status in the post- reform period, women could not reap the benefits of economic growth ushered in the Indian economy by economic reforms and were marginalized and the economic marginalization of women contributed to rising crimes against them in the post-reform period.

REFERENCES

- Bhattacharya, A. (2019, February 6). India's inequality crisis hurts girls and women the most. World Economic Forum. Retrieved from https://www.weforum.org/agenda/2019/02/india-s-inequality-crisis-hurts-girls-and-women-the-most on February 23, 2020.
- Bolis, M. & Hughes, C. (2015). Women's economic empowerment and domestic violence: links and lessons for practitioners working with intersectional approaches (Oxfam Intersectionality series). *Oxfam.* Retrieved from https://www.oxfamamerica.org/static/media/files/Womens_Empowerment_and_Domestic_Violence_-_Boris__Hughes_hX7LscW.pdf on February 24, 2020.
- Gupta, S. P. (1969). *Statistical methods* (38th ed.). New Delhi, Sultan Chand & Sons.
- Gujarati, D. N. & Sangeetha (2007). *Basic econometrics* (4th ed.). New Delhi, Tata McGraw-Hill Publishing Company Limited.
- Himabindu, B. L., Arora, R. & Prashanth, N. S. (2014). Whose problem is it anyway? Crimes against women in India. *Global Health Action.* doi: 10.3402/gha.v7.23718. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4107300/ on February 25, 2020.
- Kabeer, N. (2014). Violence against women as 'relational' vulnerability: Engendering the sustainable human development agenda (Occasional paper). *UNDP Human Development Office.* Retrieved from http://hdr.undp.org/sites/default/files/kabeer_hdr14.pdf on February 24, 2020.
- Kumar, G. & Dixit, P. (2016). Growth and pattern of women employment in India. *International Research Journal of Human Resources and Social Sciences, 3*(3), 68-82.
- Qazi, M. Women bear greater brunt of poverty in india's deeply entrenched patriarchal system. *Counterview.org.* Retrieved from https://counterview.org/2017/09/27/women-bear-greater-brunt-of-poverty-in-indias-deeply-entrenched-patriarchal-system/ on February 23, 2020.

 ISBN: 978-81-952196-0-5

- Sanghera, T. (2019, March 25). How unpaid work keeps India's women poor and unequal. Indiaspend. Retrieved from https://www.indiaspend.com/how-unpaid-work-keeps-indias-women-poor-and-unequal/ on February 23, 2020.
- Swamikannan, D. & Jeyalakshmi, C. (2015). Women labour in India: Some facts. *International Journal of Business and Economics Research, 1*(1), 22-28.
- United Nations (2018). A practitioner's toolkit on women's access to justice programming: Ending violence against women (Module 3). Retrieved from https://www.unodc.org/pdf/criminal_justice/WA2J_Consolidated.pdf on February 24, 2020.

WEBLIOGRAPHY

1. censusindia.gov.in (Retrieved on February 20, 2020).
2. ourworldindata.org (Retrieved on February 23, 2020).
3. ibef.org (Retrieved on February 23, 2020).
4. www.who.int ((Retrieved on February 23, 2020).

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MEDICINAL PLANT ORIGANUM VULGARE (OREGANO), SALVIA OFFICINALIS (SAGE), OCIMUM BASILICUM (BASIL), FOENICULUM VULGARE (FENNEL), MENTHA PIPERITA (PEPPERMINT) USED AGAINST VIRAL DISEASES

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ABSTRACT
The medicinal plants are effective against multiple human viruses. Viral diseases have evolved numerous defense mechanisms against antiviral agent. The herbs are main basic therapy for the viral infection and other pathogenic disease. The medicinal planst are also used for anti-inflammatory activity. In the present review, we have collected and analysed the data for the medicinal plants and its applications against viral diseases. From the review of literature, it is concluded that the medicinal plants play vital role in preventing and curing different viral diseases.

INDRODUCTION
Viruses are very tiny germs. They are made from genetic material inside a protein coating. Viruses cause familiar infectious diseases like the cold, flu and warts. They also cause severe illnesses like HIV/AIDS, Ebola, and COVID-19. Viruses are like hijackers. They invade living, normal cells and use those cells to multiply and produce other viruses like themselves. This can kill, damage, or change the cells and make you sick. Different viruses attack certain cells in your body like your liver, system respiratory, or blood. When you get an epidemic, you'll not always get sick from it. Your system could also be ready to fight it off. For most viral infections, treatments can only help with symptoms while you wait for your immune system to fight off the virus. Antibiotics do not work for viral infections. There are antiviral medicines to treat some viral infections. Vaccines can help prevent you from getting many viral diseases. The length of time you're infectious for after having a viral infection depends on the sort of virus involved. The infectious period often begins before you start to feel unwell or notice a rash .You can actually infect someone before you start feeling symptoms of the flu. You are most contagious within the 3 to 4 days after you begin to feel sick, and remain contagious as long as you've symptoms. Usually this is often a few weeks period, but it might be a couple of days more for youngsters or people with weak immune system.

APPLICATION OF MEDICINAL PLANTS IN ANTIVIRAL DISEASES

1. Origanum Vulgare
Oregano is rich in antioxidants, which are compounds that help fight damage from harmful free radicals within the body. Oregano is a popular herb in the mint family that's known for its impressive medicinal qualities. The compounds of plant include carvacrol, which offers antiviral properties. In a test-tube study, both oregano oil and isolated carvacrol reduced the activity of murine norovirus (MNV) within 15 minutes of exposure. MNV is very contagious and, therefore, it is the primary explanation for gastroenteritis in humans. It is very similar to human norovirus and used in scientific studies because human norovirus is notoriously difficult to grow in laboratory settings. Oregano oil and carvacrol have also been shown to exhibit antiviral activity against herpes simplex virus type-1

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(HSV-1); rotavirus, a standard explanation for diarrhea in infants and children; and respiratory syncytial virus (RSV), which causes respiratory infection.

2. **Salvia Officinalis**

Sage a member of the Labiatae, is an aromatic herb that has long been utilized in traditional medicine to treat viral infections. The antiviral properties of sage are mostly attributed to compounds called safficinolide and which are found within the leaves and stem of the sage plant. Test-tube research indicates that this herb may fight human immunodeficiency (IVl-1), which can lead to AIDS. In one study, sage extract significantly inhibited HIV activity by preventing the virus from entering target cells. Sage has also been shown to combat HSV-1 and Indiana vesiculovirus, which infects livestock like horses, cows, and pigs. sage oil, are thought to have antibacterial qualities. By observing the antibacterial effects of clary sage volatile oil it was found that its antibacterial qualities worked against all strains of bacteria tested. Clary sage essential oil was also found to reduce the growth E.coli significantly and appeared to attack bacteria cells in several different ways. Other research studies have also suggested that some of the chemical components of clary sage have anti-fungal effect and sage oil increases estrogen in the body.

3. **Ocimum basilicum**

Many types of basils, including the sweet and holy varieties, may fight certain viral infections. For example, one test-tube study found that sweet basil extracts, including compounds like apigenin and ursolic acid, exhibited potent effects against herpes viruses, hepatitis B, and enterovirus. Holy basil, also known as tulsi, has been shown to increase immunity, which may help fight viral infections. In a 4-week study in 24 healthy adults, supplementing with 300 mg of holy basil extract significantly increased levels of helper T cells and natural killer cells, both of which are immune cells that help protect and defend your body from viral infections. Holy Basil is an ancient herb used for its healing properties for thousands of years. Today, you can find it as a supplement or as Tulsi tea. It is also used for stomach spasms, loss of appetite, intestinal gas, kindey conditions, head colds and in anti-inflammatory conditions such as arthritis, heart diseases. Basil has antiviral properties may help to fight different viruses.

4. Foeniculum Vulgare

Fennel may be a licorice-flavored plant which will fight certain viruses. A test-tube study showed that fennel extract exhibited strong antiviral effects against herpes viruses and parainfluenza type-3 (PI-3), which causes respiratory infections in cattle. What’s more, trans-anethole, the main component of fennel essential oil, has demonstrated powerful antiviral effects against herpes viruses. Fennel seeds also reduce inflammation. This may help soothe swelling or irritation in the intestines and improve digestion. Fennel seeds may also relax muscles in the intestines, which can help relieve constipation. Soothing muscles in the stomach and intestines helps to relieve gassiness that’s from constipation or acid reflux. According to animal research, fennel may also boost your immune system and decrease inflammation, which may likewise help combat viral.

5. Mentha piperita

Peppermint is understood to possess powerful antiviral qualities and commonly added to teas, extracts, and tinctures meant to naturally treat viral infections. Its leaves and essential oils contain active components, including menthol and rosmarinic acid, which have antiviral and anti-inflammatory activity. In a test-tube study, peppermint-leaf extract exhibited potent antiviral activity against respiratory syncytial virus (RSV) and significantly decreased levels of inflammatory compounds. Peppermint oil naturally cleanses the skin and has antiseptic and antibacterial properties. It has a cooling effect which soothes irritation and inflammation due to acne. Peppermint oil is great for your hair and scalp. It helps against dryness or itching (which is useful during viral infection). It helps in removing dandruff because it has antiseptic and anti-inflammatory properties. It also helps strengthen hair roots which will help in treating hair loss. Peppermint oil is one among the key essential oils that are proven to assist with headaches," said Dr. Sara Crystal, MD.

RESULT AND DISCUSSION

In the current paper,review study was initiated because of the increasing use of of antiviral agents. The anti-inflammatory activity of plant part from five medicinal plants species has been studied in vitro against pathogen including all type of viral diseases. Herbs are very beneficial for the viral diseases as well as bacterial diseases. Many type of herbs are used in different purposes in the antiviral infection. Now a days, the best example for viral infection is COVID-19 which spread all over the world but some herbs are useful in preventing from these type of viral diseases.

CONCLUSION

From above discussion, it is concluded that five types of medicinal plants Origanum vulgare, Salvia officinalis, Ocimum basilicum, Foeniculum Vulgare, Mentha piperita are more efficient against viral diseases. Our work suggests that several herbal medicines have safety margins superior to those of reference drug and enough levels of evidence to start a clinical discussion about their potential use as adjuvants in the treatment of early/mild common flu in otherwise healthy adults within the context of COVID-19. More study is needed to explore the medicinal potential of these plants against viral diseases for the benefit of mankind.

REFERENCES

1. Buckwold V.E., Beer B.E., Donis R. O. Bovine viral diarrhea virus as a surrogate model of hepatitis C virus for the evaluation of antiviral agents. Antiviral Res. 2003; 60(1):1–15.

2. Smidling D, Mitic-Culafic D, Vukovic-Gacic B, D, Knezevic-Vukcevic J. Evaluation of antiviral activity of fractionated extracts of Sage *Salvia officinalis* L. (Lamiaceae) Arch Biol Sci. Belgrade. 2008; 60:421–9.

3. Lien-Chai Chiang et al. Antiviral activities of extracts and selected pure constituents of Ocimum basilicum Clin Exp Pharmacol Physiol. 2005 Oct.32(10), 811-6.

4. Mantovani A, Allavena P, Sica A, Balkwill F. Cancer-related inflammation. Nature. 2008; 454:436–444. doi: 10.1038/nature07205.

5. Szretter KJ, Gangapper S, Lu X, Smith C, Shieh WJ, Zaki SR, Sambhara S, Tumpey TM, Katz JM. Role of host cytokine responses in the pathogenesis of avian H5N1 influenza viruses in mice. J. Virol. 2007; 81:2736–2744. doi: 10.1128/JVI.02336-06.

6. Sharma M, Anderson SA, Schoop R, Hudson JB. Induction of multiple pro-inflammatory cytokines by respiratory viruses and reversal by standardized Echinacea, a potent antiviral herbal extract. Antivir. Res. 2009; 83:165–170.

7. Wang KC, Chang JS, Lin LT, Chiang LC, Lin CC. Antiviral effect of cimicifugin from *Cimicifuga foetida* against human respiratory syncytial virus. Am. J. Chin. Med. 2012; 40:1033–1045.

8. Wang KC, Chang JS, Lin LT, Chiang LC, Lin CC. Antiviral effect of cimicifugin from *Cimicifuga foetida* against human respiratory syncytial virus. Am. J. Chin. Med. 2012; 40:1033–1045.
9. Anti-viral activity of water extract of *Paeonia lactiflora pallas* against human respiratory syncytial virus in human respiratory tract cell lines. Am. J. Chinese Med. 2013; 41:585–599.
10. Anti-viral activity of water extract of *Paeonia lactiflora pallas* against human respiratory syncytial virus in human respiratory tract cell lines. Am. J. Chinese Med. 2013; 41:585–599. doi: 10.1142/S0192415X13500419.

PERSPECTIVE OF STUDENTS ABOUT ENVIRONMENTAL LITERACY: HOW DOES IT RELATE TO STUDENTS' ENVIRONMENTAL LITERACY?

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ABSTRACT

Education is one of the solutions to answer massive environmental problems by implementing environmental education. Environmental education aims to make students and communities literate towards the environment. Environmental literacy means individual attitudes and dispositions and knowledge toward the environment. Many things that can lead to people's environmental literacy include education in schools and social environments. In addition, people perspective on environmental literacy will certainly also affect environmental literacy. This study aims to examine how students' perspectives on environmental literacy support students' environmental literacy. Perspective on environmental literacy discussed about how one's point of view about environmental literacy. Individual point of view regarding environmental literacy will affect their environmental literacy. This research was conducted at Junior High School 2 Suayan as a school located in a green open space. The total sample of research consists of 70 students from grades I, II & III. This research was conducted by tests and non-tests. The students' perspective on environmental literacy was observed in 6 main parts namely students' perspective on environmental literacy knowledge (1), the perspective on the importance of environmental literacy (2), the perspective on the benefits of environmental literacy (3), the perspective on environmental literacy practice (4), the perspective on environmental literacy information (5), and the perspective on environmental expectations (6). The scores of these main parts respectively are 80%, 84.4%, 84.7%, 80.7%, 80.8%, 82.8%. So, the average percentage of students' perspective scores on environmental literacy is 82.3% with the interpretation of almost all students having a good view of environmental literacy. This positive response means students support in the implementation of activities in improving environmental literacy skills. While the the analysis conducted on the domain of environmental literacy, the scores obtained by students in the respective studies for the domains of knowledge, attitudes, and behaviors were 66.6%, 83.3%, and 81.3%. The average percentage of environmental literacy obtained by the same students is 77.1% with a high category. In this study it was found that students who have a good perspective on environmental literacy will have good literacy as well. So, it can be concluded that how students view environmental literacy will affect their environmental literacy.

Keywords: Environmental Education, Environmental Literacy, Green Open Space, Perspective of Students

INTRODUCTION

Environmental issues are increasingly complex and increasingly difficult to control. The fact that there is a very large amount of pollution caused by individuals, a public understanding of the environment and related issues must be instilled immediately (Disinger & Roth, 2000). Education is one of the solutions to answer massive environmental problems by implementing environmental education. Onwu & Kyle (2011) stated that learning on classroom should absorb all socio-science issues if they really want to prepare a sensitive future society to complex daily problems.

The growing population and huge natural exploitation caused inevitable environmental damage and eliminated the habitat of living things (Sya'ban, Moh, 2018). In response to the need for environmental education can be known from the design of the curriculum in each country, including in Indonesia (Maknun, 2011). In Indonesia, the program for environmental education is implemented in the form of adiwiyata program that started for elementary schools in 2016 (Rezkita & Wardani, 2018). In this regard, education has a function to provide knowledge, understanding, beliefs and ecological behavior of human beings (Ahmad, 2010), as well as build affective aspects such as values, behaviors, and commitment to create a sustainable future life (Marliani, 2014).

According to Ardoin & Merrick (2013) that environmental education means equipping people with the knowledge, ability, and motivation to take care of the environment. Environmental education conducted by utilizing the school environment as a learning resource will create a green school (Afandi, 2013). Environmental education is very important because it is a tool to make people understand and competent to perform scientific performance and participate in addressing environmental problems (Bonnett, 2010). Environmental education aims to make students and communities that are literate towards the environment.

Meilinda (2017) stated that environmental literacy shows people's knowledge related to the mechanisms of nature's work and the role of humans in safeguarding the nature. Individual attitudes and dispositions and knowledge of the environment describe one's environmental literacy (Timur et al. 2017). The change of character possessed by people who have environmental literacy is a pro-environment attitude that has the awareness to improve environmental problems and prevent environmental damage (Wong & Chan, 2018). Attitudes and actions in environmental literacy can be instilled in students through the development of learning processes that emphasize on finding, exploring, investigating information, and planning actions for environmental problem solving (Susilowati et al., 2018).

Research conducted by Meilinda (2017) confirmed that the conclusion of the environmental literacy of Adiwiyata school in Surakarta is still low which is shown by the low aspect of environmental care attitude rather than the knowledge aspect of the environment. While Susilastri & Rustaman (2015) conducted research in adiwiyata schools and found that the level of knowledge and environmental attitudes of students are categorized as low. Meanwhile, based on research conducted by Maulaa et al. (2020) in grade 7 junior school students on global warming materials, it was obtained that environmental literacy are categorized as medium.

Many factors that affect students' environmental literacy include the use of EESD approach in classroom learning (Wilujeng et al., 2019), the role of teachers and various stakeholders (Gayford, 2002; Indrati & Hariadi, 2016; Tosun & Gursakal, 2016), availability of green open space (Mulyana, 2009). Therefore, in this study will examine how the student's perspective supports the student's environmental literacy. According to KBBI perspective is interpreted with a point of view or view. In the case of this study, it can be defined that the perspective of environmental literacy is one's view of environmental literacy. One's perspective on something will certainly affect one's understanding of it.

METHOD

This research is a type of descriptive research that tries to examine how students' perspectives support students' environmental literacy in green open areas. Research was conducted to reveal the characteristics of the subjects (Fraenkel et al., 2012) or the real condition of the population through selected samples so that in this study obtained the profile and perpesctive of students on environmental literacy. This research was conducted at Junior High School 2 Suayan as a school located in a green open area. The total sample of research consists of 70 students from grades I, II & III.

This research was conducted in two ways, namely by tests and non-tests. In this research, the environmental literacy is measured in 3 domains, namely the domain of knowledge, attitudes to the environment and behavior to the environment. The domain of knowledge is measured by tests while the domain of attitudes and behaviors is measured by a questionnaire. The perspective of environmental literacy is also measured by using a likert scale questionnaire. For more details here is a summary of variables measured along with the number of research instruments and environmental literacy score transformation tables.

Table 1. Number of Instrument

NO	Measured	Variable	Instrument	Output	Items
1	Environmental Literacy	Knowledge	Test	Score	15 items
		Attitudes towards the environment	Questionnaire	Scale	15 items
		Behavior towards the environment	Questionnaire	Scale	15 items
2	Perspective on Environmental Literacy	Perspective on environmental literacy	Questionnaire	Scale	23 items

Table 2. Score Transformation

NO	Domains of Environmental Literacy	Items	Range Score	Minimal Score	Maximal Score
1	Knowledge	15	0 – 15	0	15
2	Attitude toward environment	15	15- 60	15	60
3	Behavior toward environment	15	15- 60	15	60
Environmental Literacy		*36*	*30- 135*	*30*	*135*

(McBeth & Volk, 2009)

Table 3. Score Interpretation

Range Score	Interpretation
22,2% – 48,1 %	Low
48,2% - 74,1%	Medium
74,2% - 100%	High

Perspective means the perspective of students and the school community towards environmental literacy. This perspective is obtained by collecting data with questionnaires. Questionnaire in the form of a scale likert consisting of 23 statement items. Percentage is calculated by using the following formula,

$$\% \text{ perspective} = \frac{Obtained\ Score}{Maximum\ Score} \text{ x } 100$$

Then, for the interpretation of values is based on categories created by Koentjaraningrat (1990). The following conversion table is shown in table 4.

Tabel 4. Interpretation of Score

Range Score	Category
0 %	Nothing

1%-25%	A small part of
26%-49%	Almost half of
50%	Half of
51%-75%	Most of
76%-99%	Almost entirely of
100%	Entirely of

RESULTS AND DISCUSSION

In this study, perspective on environmental literacy is about how one's point of view about environmental literacy. Perspective is measured because one's point of view regarding environmental literacy will affect one's literacy. As a parable that a person who has the view that environmental literacy is important then that person will try to improve his literacy. Thus, the perspective in this case will determine one's efforts to improve his literacy skills. According to KBBI perspective it is interpreted that point of view in this case of the study can be defined that the perspective of environmental literacy is one's view about environmental literacy. The study in the perspective of environmental literacy is divided into several sections, namely the students' perspective on environmental literacy knowledge, the perspective on the importance of environmental literacy, the perspective on environmental literacy practice, the perspective on the benefits of environmental literacy, the perspective on environmental literacy information, the perspective on expectations for the environment.

The result of the processing of the students' perspective questionnaire on environmental literacy obtained the percentage of students' perspective score on environmental literacy is 82.3% with the interpretation of almost all students have a good view of environmental literacy. Furthermore, there are several main parts observed in this perspective study, namely students' perspective on environmental literacy knowledge (1), the perspective on the importance of environmental literacy (2), the perspective on the benefits of environmental literacy (3), the perspective on environmental literacy practice (4), the perspective on environmental literacy information (5), and the perspective on environmental expectations (6). The score of these main parts respectively are 80%, 84.4%, 84.7%, 80.7%, 80.8%, 82.8%. For more detail can be seen on table 5.

Table 5. Percentage of students' environmental literacy perspectives

NO	Main Parts	Score	Interpretation
1	The perspective on environmental literacy knowledge	80%	Almost all students have a positive view on environmental literacy knowledge
2	The perspective on the importance of environmental literacy	84.4%	Almost all students have a positive view on the importance of environmental literacy
3	The perspective on the benefits of environmental literacy	84.7%	Almost all students have a positive view on the benefits of environmental literacy
4	The perspective on environmental literacy practice	80.7%	Almost all students have a positive view on environmental literacy practice
5	The perspective on environmental literacy information	80.8%	Almost all students have a positive view on environmental literacy practice

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6	The perspective on environmental expectations	82.8%	Almost all students have a positive view on environmental expectations
Perspective on Environmental Literacy		82.3%	Almost all students have a positive view on Environmental Literacy

The first part, the interpretation of the student's perspective score on knowledge of environmental literacy is categorized and almost all of students having a good perspective. This means that students understand and know well about the meaning and understanding about environmental literacy. The second part, the interpretation of students' perspective scores on the importance of environmental literacy is categorized almost entirely as having a good perspective. This means students understand very well how important it is to have the ability of environmental literacy. The third part, the interpretation of student scores categorized environmental literacy benefits almost entirely as having a good perspective. It means that students are very blessed with the benefits of having environmental literacy. Fourth part, the interpretation of students' perspective scores on environmental literacy practices is categorized almost entirely as having a good perspective. So, students carry out behaviors that support the application of principles in a sustainable environment. The fifth part, the interpretation of students' perspective scores on environmental literacy information is categorized almost entirely as having a good perspective. This means that students always strive to improve information on environmental issues. Lastly, the interpretation of students' perspective scores on expectations for the environment is categorized almost entirely as having a good perspective. This means students have excellent expectations and desires to create a sustainable environment. It is generally said that students show a positive response in an environmental literacy perspective. This positive response means students support in the implementation of activities in improving environmental literacy skills. Thus, at least it can be confirmed in this study that students have a good understanding of the concept of environmental literacy, aware of the benefits and importance of environmental literacy and practice environmental literacy behavior in daily life.

Furthermore, this study discusses about how perspective relates in supporting students' environmental literacy. Therefore, measurements of environmental literacy are carried out on the same students. Analysis of environmental literacy in students is observed in 3 domains of environmental literacy, namely knowledge, attitudes and behaviors. The results of students' environmental literacy are at a high level with an average score of 77.1%. Based on these findings, it can be said that students in schools have knowledge about a good environment, a good environmental care attitude and good daily environmental practices. Then, the analysis conducted on the domain of environmental literacy, the scores obtained by students in the respective studies for the domains of knowledge, attitudes, and behaviors were 66.6%, 83.3%, and 81.3% with an average score of 77.1%. Among the 3 domains the lowest score obtained by students is in the domain of knowledge. More detail of the percentage score of student environmental literacy in the 3 domains can be seen in the figure 1.

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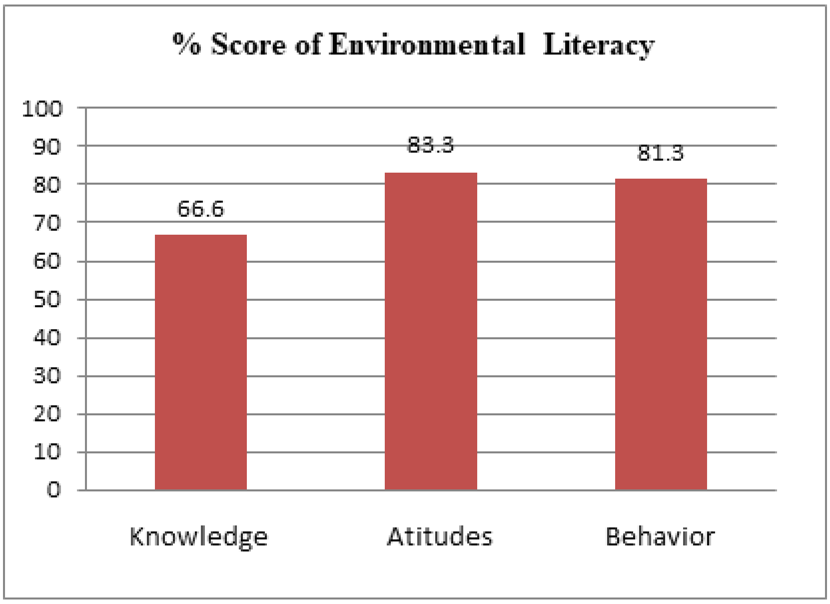

Figure 1. Percentage of students' environmental literacy in the domain of knowledge, attitudes and behaviors

Interpretation of scores for the domain of knowledge is moderate while for the domain attitudes and behaviors are interpreted high. But for the overall literacy of the student environment is categorized as high. In this study it was found that students who have a good perspective on environmental literacy will have good literacy as well. As previously stated, perspective is measured because one's point of view regarding environmental literacy will affect one's literacy. Thus, the perspective in this case will determine one's efforts to improve his literacy skills. Students who view environmental literacy as something that is needed in life, then students will always try to improve their literacy s. So, it can be concluded that how students view environmental literacy will affect their literacy skills.

CONCLUSION

Perspective is measured because one's point of view regarding environmental literacy will affect one's literacy. Thus, the perspective in this case will determine one's efforts to improve his literacy. The percentage of students' perspective score on environmental literacy is 82.3% with the interpretation of almost all students have a good view of environmental literacy. It is generally said that students show a positive response in an environmental literacy perspective. This positive response means students support in the implementation of activities in improving environmental literacy. Next, to know how the perspective relates in supporting the student's environmental literacy, it is measured the environmental literacy of the same student. Analysis of environmental literacy in students is observed in 3 domains of environmental literacy, namely knowledge, attitudes and behaviors. The results of students' environmental literacy are at a high level with an average score of 77.1%. In this study it was found that students who have a good perspective on environmental literacy will have good literacy as well. So, it can be concluded that how students view environmental literacy will affect their literacy.

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REFERENCES

- Afandi, R. (2013). Integrasi Pendidikan Lingkungan Hidup Melalui Pembelajaran IPS di Sekolah Dasar Sebagai Alternatif Menciptakan Sekolah Hijau. *PEDAGOGIA: Jurnal Pendidikan*, *2*(1), 98. https://doi.org/10.21070/pedagogia.v2i1.50

- Ahmad, M. (2010). Pendidikan Lingkungan Hidup Dan Masa Depan Ekologi Manusia. *Edukasia Islamika*, *8*(1), 57–71.

- Ardoin, N., & Merrick, C. (2013). *Environmental Education : A Brief Guide for U . S . Grantmakers Environmental Education : A Brief Guide for U . S . Grantmakers Grantmakers across the globe have set their sights on a future in which*. https://people.stanford.edu/nmardoin/sites/default/files/Grantmakers 10.6.pdf

- Bonnett, M. (2010). Environmental education. *International Encyclopedia of Education*, 146–151. https://doi.org/10.1016/B978-0-08-044894-7.00585-6

- Disinger, J. F., & Roth, C. E. (2000). Environmental Literacy. *Journal of Wildlife Rehabilitation*, *23*(3), 25–26. https://doi.org/10.4324/9781315169682-1

- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). How To Design and Evaluate Research in Education. In *McGraw-Hill*. https://doi.org/10.24036/diakronika/vol20-iss2/148

- Gayford, C. G. (2002). Environmental literacy: Towards a shared understanding for science teachers. *Research in Science and Technological Education*, *20*(1), 99–110. https://doi.org/10.1080/02635140220130957

- Indrati, D. A., & Hariadi, P. P. (2016). Esd (Education for Sustainable Development) Melalui Pembelajaran Biologi. *Symposium on Biology Education*, 371–382.

- Koentjaraningrat. (1990). Metode-metode Penelitian Kemasyarakatan. In *Jakarta: Gramedia Pustaka.*

- Maknun, D. (2011). Praktikum proyek ekologi berbasis kondisi ekobiologis lokal dalam meningkatkan literasi lingkungan dan tindakan konservasi mahasiswa. *Jurnal Holistik*, *12*(2), 1–40.

- Marliani, N. (2014). PEMANFAATAN LIMBAH RUMAH TANGGA (SAMPAH ANORGANIK) SEBAGAI BENTUK IMPLEMENTASI. *JURNAL FORMATIF*, *4*(2), 124–132.

- Maulaa, I., Hamidah, I., & Permanasari, A. (2020). Environmental literacy profile of 7th grade junior high school students in science learning on global warming subject. *Journal of Physics: Conference Series*, *1521*(4). https://doi.org/10.1088/1742-6596/1521/4/042122

- McBeth, W., & Volk, T. (2009). The national environmental literacy project: A baseline study of middle grade students in the United States. *Journal of Environmental Education*, *41*(1), 55–67. https://doi.org/10.1080/00958960903210031

- Meilinda, H. (2017). *178429-EN-students-environmental-literacy-profile-1*. *11*, 299–306.

- Mulyana, R. (2009). PENANAMAN ETIKA LINGKUNGAN MELALUI. *JURNAL TABULARASA PPS UNIMED*, *6*(2), 175–180.

- Onwu, G. O. M., & Kyle, W. C. (2011). Increasing the socio-cultural relevance of science education for sustainable development. *African Journal of Research in Mathematics*, *Science and Technology Education*, *15*(3), 5–26. https://doi.org/10.1080/10288457.2011.10740715

- Rezkita, S., & Wardani, K. (2018). Karakter Peduli Lingkungan di Sekolah Dasar. *TRIHAYU: Jurnal Pendidikan Ke-SD-an 4.2*, 327–331.
- Susilastri, S. D., & Rustaman, N. Y. (2015). Students'environmental Literacy Profile in School-Based Nature and in School that Implement the Adiwiyata Program. *Seminar Nasional Konservasi Dan Pemanfaatan Sumber Daya Alam 2015*, 263–266.
- Susilowati, S., Wilujeng, I., & Hastuti, P. W. (2018). Growing Environmental Literacy Towards Adiwiyata Schools Through Natural Science Learning Based on Pedagogy for Sustainability. *Journal of Science Education Research*, *2*(2), 97–100. https://doi.org/10.21831/jser.v2i2.22480
- Sya'ban, Moh, A. (2018). Tinjauan mata pelajaran IPS SMP pada penerapan pendidikan lingungan hidup untuk peduli akan tanggung jawab lingkungan. *Jurnal Geografi, Edukasi Dan Lingkungan (JGEL)2*, *02*(01), 32–44.
- Timur, S., Timur, B., Yilmaz, S., Timur, S., Timur, B., & Yilmaz, S. (2017). *Determining Primary School Candidate Teachers ' Levels of Environmental Literacy Determining Primary School Candidate Teachers ' Levels*. *0073*. https://doi.org/10.1080/09720073.2013.11891335
- Tosun, E. K., & Gursakal, S. (2016). Environmental Literacy Levels of The Classroom Teachers In Turkey. *The Online Journal of New Horizons In Education*, *6*(3), 33–59.
- Wilujeng, I., Dwandaru, W. S. B., & Rauf, R. A. B. A. (2019). The effectiveness of education for environmental sustainable development to enhance environmental literacy in science education: A case study of hydropower. *Jurnal Pendidikan IPA Indonesia*, *8*(4), 521–528. https://doi.org/10.15294/jpii.v8i4.19948
- Wong, C. A., & Chan, J. K. (2018). *CONCEPTUALIZING ENVIRONMENTAL LITERACY AND FACTORS AFFECTING PRO-ENVIRONMENTAL BEHAVIOUR*. *19*, 128–139.

ORIENTAL INTERPRETATION IN B. ROKEYA'S *ABARADH BASINI*: A STUDY ON PENCILING ORIENTALISM

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ABSTRACT

The main objective of this paper is to show the oriental attitude inside women and oppression against them in the name of religious dogmas. Orientalism has been taken to her as an agony for the independence in the family and the state as well. The family of Indian subcontinent was significantly representation of orientalism. Begum Rokeya has artistically portrayed the massive traditional nature of those families. She described the behavour and talking styles in a family among each other. The women's nature is ready to consider subordination and abuses against them. They are inferior by birth. Begum Rokeya had criticized women's naive attitude. The society named her 'woman' by nature; not by born. Physical and mental torture was welcomed to women in British Reign. Not only women but also men are not prepared to accept the education and technology from the British. The reason behind it was religion as the British were Christian. Following and adopting their culture was accepted as the religious sin for the continent people. The outcome is an abject-loss. Begum Rokeya has tried to show that if women are kept continuously ignored or have been secondary in the society, more and more abject disaster will capture in the progress of colonial humanity. English has become a prosperous language even for the development of English nations themselves but the Indian Muslim Society is not ready to understand the fact. In colonial era they used to think that English was a Christian language and it would be an unborn-sin if get ready to learn English language. Men themselves with women were showing negligence to learn English but Begum Rokeya inspired women for education and learning of English, which later made a visible impact on the status of women. Orientalism has been seen in the characters of women. This affected all Indian humans' major rights. Now it is very clear that not only women attitudes are oriental but also the ruling people who govern the society, family as well as country are oriental; not in geographical but in politics, economic, nature and thinking too.

Keywords: Colonial, Geographical, Orientalism, Oppression, Technologies,

The geographical facts are not the sole criteria in differentiating the East and the West. This division is also based on thinking and the culture. So, orientalism exists into behavioral conducts and its observations. According to Vico's observation:

"…men make own history, that what they can know is what they have made, and extend it to geography: as both geographical and cultural entities- to say nothing of historical entities- such locales, regions, geographical sectors as "Orient" and "Occident" are man-made. Therefore, as much as the West itself, the Orient is an idea that has a history and a tradition of thought, imagery, and vocabulary that have given it reality and presence in and for the West. The two geographical entities thus support and to an extent reflect each other…." (Said, 4-5)

The said idea has been disclosed in the writing of Begum Rokeya in her wellknown novel *Abaradh-Basini.* Among the fundamental rights, education is one of the most essential for the people removing the ignorance, traditional obstacle, economic barriers, cultural discrimination as well as inhumanity and so on. Education is universal; one can earn education from anywhere. So, there is no reason to avoid education. From the very beginning of the human beings,

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unequal gender division is seen between two sexes; Masculine and Feminine. The first one is dominated figure and the second one is inferior to the first one. In this sense, the inferior kind of human beings is being oppressed by their opposite dominated gender. Here, male is enjoying everything. They have no restriction, no laws for them. They do whatever they want. Even showing superiority over female, they have been oppressing, threatening and physically torturing the opposite gender. Begum Rokeya stands against oppression of women and female character. Basically, we were born as human beings but society differentiates us as male and female on the basis of the physical structure. For Begum Rokeya, these organs are necessary for keeping alive the civilization and reproduction as per divine commitment. Where God gives the universe, the sun, the moon and air for all, so why equal opportunity is not given at every section of the society. Why female is kept in isolation in the name of purdah. Begum Rokeya insulted male nature over female figure which is accepted as physically weak. She also criticized female figures who are blindly obeying the male dominance. In her novel she presented it well through one character Saber. Life of all female members in Saber's (who is the father writer in the novel is autobiographical in nature) family, Rokeya had to live behind the curtain from the age of five. The restriction was such strong that they had to wear purdah before unknown women, while there is the restriction in the religion to wear purdah for Muslim ladies having interactions with the men other than blood relations only. Rokeya had confessed that when she was only five, she was not allowed to be seen by any male. She was born a conservative aristocratic family where contemporary Bengali Muslim Society's rules were strongly followed and women education was not appreciated at all. She experienced oriental facts from her life. This orientalism is such sticky substance that a little girl cannot to be allowed to move freely. It is a natural orientalism that was used to protect the consciousness about customs.

Naturally orientalism comes from the story of thirteen when the father of Hira, a 9 years school girl, wanted an investigation that the school bus cannot enter into a narrow road through which Hira came to school and went back home. Once a tea potter was coming with kettle and unfortunately, Hira stock with the man and some tea poured on the cloth of Hira. Showing the consciousness of an oriental father, the speaker is quoting the investigation to Begum Rokeya below:

"…. come to know from the investigation, Hira's burkah has no eyes. Other girls said that they saw maternal uncle of Hira took her close to lap and took her walking towards home. As the burkha has no eyes, she could not walk properly – one day she fell down on a cat, - sometimes stock on road. Yesterday, Hira herself pushed the pot bearer and fell his tea of the earth." (Rokeya: 138)

Rokeya emphasized women education to release them from the burden so that they could be free and speak as humans. Her struggles to improve Indian women's position among the biased social morals are marked by *Sultana's Dream,* "God Gives, Man Robs" and "Educational Ideas for the Modern Indian Girl", *Avaradh-Basini, Motichur-1, Motichur-2, Padmarug* and so many letters as well as seminars. To continue her ambition to free woman and educational liberation of women, she established two schools in two different places; Bhagalpur and Kolkata. This paper will discuss how Rokeya treated purdah in her writings and showed how to come out from traditional system for enlightening women as well as men's attitude towards women education in her writings.

Describing the mental status of women Rokeya discussed in her novel *Abaradh-Basini* consisting of 47 stories. The stories are some historical and eyecatching truth. Sometimes, the writer satires, mixes the laughing facts and sometime the reader can cry observing the

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helplessness of women in the patriarchal family. These stories have been written to show the Colonial Indian Society that the people can make correction of their thinking. The women are very inferior to men. They think that they are useless and burden of the society. But they never think that they have a great need in the society. They can contribute their ideas. Where the half of the population is women, how they become a man of nothing.

"…when the entire nation was suffering from suspicion, hesitation and bewilderment from all around, Mrs. R. S. Hussein came down to earth from the Heaven with the message of belief and life wherein our all destroyed strayed society found an enlightened path. (Kha, 1339 Bangla, p. 267)

The novel has been started by the writer saying that her mother supported seclusion customs. She has never seen her mother to violate the order of her father. Even she has done nothing from her own decision. Man and woman are equally created by the Almighty, but people differentiated them imposing superior and inferior position in the society. They are not being considered that they can change the society and can make the country independent. Women cannot think so because 'social status of women seemed to be dependent on their men' (Mill, 1840). The religious tradition attribute for their humility and subordination to men in all matter. They denied the opportunity of education except upper classes women especially Hindu; not Muslims. Even today, Muslims of Indian Subcontinent are far behind because of their ignorance of fundamental rights i.e., literacy. Some Hindu women have grasped the opportunity of education. They strongly felt that education can make them equal to the British while Muslims themselves engaged into war with British but they could not fail to achieve the same. They thought that the British have come to India to make the women of this country Christian which will pollute them and is against the Islam.It is because the strict rules have been imposed upon women. They denied sending girls to the Christina schools. They permitted women to learn Arabic and Urdu. Forgetting that development only comes on well education. The women of that time bent head and accepted the initiative torture as orientalist.

"….my affectionate mother was a sole supporter of the seclusion customs. [……….] then was summer season. Cover the windows with thick quilt of the pulki, my youngest sister, 2.5 years age was crying 'hua-hua'. Dear mother tried to stop her heart and soul. But people sitting near the pulki did not feel to get out the child outside…" (Rokeya: 131)

Oriental barbarism does not escape the infant child even. The crying of the baby did not touch the mind of oriental people. They became dumb with the association of the orientalism.

When the fundamental right is going obscured, inhumanity begins. It affects to the human beings' social, economic and political life. Begum Rokeya is a sensible social worker in the seclusion society. She has brought some physical examples to show the audiences real picture of inhumanity in the society. Irrespective of child and adult; girls and lady, nature of masculine gender is unchanged and steady. They are the material in their decision and they are only decision makers.

"…once we are coming to Calcutta; my youngest sister was only 2 years. She and I am with my mother in the pulki, have captured. It was summer- covering windows with cloths she started crying 'hua-hua'. Mother was trying to stop her crying heart and soul. But the men of Allah who sat just outside the pulki had not felt need of getting the child out from the pulki." (Rokeya: 131)

The speaker confessed that women have been accepting seclusion from their born. Nobody stands against this custom because they accepted that it was the rule of their lord; men. They

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bring cloths for women; food for women and have given shelter for women. It is the vital point for which women are not talking against them. They are very afraid of men. But it is the matter of fact that the offence of seclusion does not only affect men but also affects women as well. They kept child away from shadow of the men and women. How far, they will keep distance from the eyes of men and women, that much they will be considered as 'Sharif', the efficient man.

"…instead of this, it is essential to keep saying, women's seclusion is not only against men in the entire India, but also against women. Except bosom relative and female maid, other women could not allow seeing unmarried girls. She who keeps much Purdah and hides in the corner of house is much more Sharif." (Rokeya: 131)

The custom of Purdah has been remained to the mind of all women although they are becoming urbanized. Not only the village women are keeping the tradition of seclusion but also the urbanized women are continuously practicing that tradition.

"…seeing missionary mem urban ladies started escaping away. Mem is mem- looking shari worn Christian or Bengalee lady- shut their rooms from inside". (Rokeya: 131)

In the name of Purdah, inhumanity has reached the ace in the colonial society. Irrespectively Muslims and Hindus in the colonial reign of British kept their ladies out of the British sight. They considered British, as vulture; who seized power from the county men. But it is also true that keeping Purdah we actually neglected our ladies to put them in leisure life. To Begum Rokeya, educated women can think about the invention when men are engaged with livelihood. As a social thinker, Rokeya silently started fighting against British. Whenever British were using their modern arms; men could not win over them alone with holding bamboo. From that moment, Rokeya criticizing the Purdah based society felt the essential impact of women learning.

Illiteracy covers around the society and the mind of men and women in the name of religious norm are not developing. It was accepted that women were burden to the men and to the society. People were afraid of them. Women on that time called in by several unrespectable names. Everybody used a bad name for them. Even the speaker, Begum Rokeya, called them "Human-luggage".

"…a rich man was going to Durgaling and there are one dozen human-luggages. Thus, Maasi, Pisi etc. seven ladies and 5 girls age around 5-13." (Rokeya: 140)

In the next story (no. 19), metaphorically women are compared with luggage but, here, they are called 'living-luggage'. The speaker makes her audiences understood that, the luggage has no live, no demand, no voice; likely a woman has no live, no demand and no voice. If they had voice, they could not silently tolerate kick of station master.

"…maanshi! Take your belongings from this place. Now train will come. Only people will stay in the platform. No luggage allowed. [........].. Sir, that is not luggage- it is *awrat.* [after kicking on one luggage] ... yes, yes- all are luggage. Take all away." (Rokeya: 133)

For the seclusion of women, they have lost their voices and they have isolated themselves for showing the respect of Purdah. On the other hand, men are also not eager to see women for the custom of Purdah. Men are not coming to help the women in the time of danger even. They are seeing the burning of an isolated woman who seeing man, again entered into the firing room.

Begum Rokeya's gathering experiences from her surrounding and her girlhood has affected her writing. She had seen the vicious condition of women and their silent mood against the unexpected happiness like 'self-burning' inside the room in spite of knowing certain death; they willingly stayed at a burning room. The result is self-death. It is a suicide to the view of Rokeya, because it is a life sacrificing for uniting the rules of man.

"…the fire set on a house. Wisely taking all golden ornaments into a hand box, she got out of the room. Coming on the door, she looked that crowed are putting off the fire. Not coming before men, she went back and set under the bed into the room. In that condition, she died by burning, but did not get out in front of men. Thanks! Women seclusion" (Rokeya: 136)

Ramshackle condition of the society had been pictured in the writings of Begum Rokeya. Illiteracy had encompassed around the society and family in the colonial era. When the rest of the world was going to the invention of modern science, Indian Subcontinent was full of zealous against education especially Muslim society. We can refer to an oriental minded story for supporting this condition.

"…. rolling by burkha, maternal uncle's wife fell down between the railways. There were no women on that time. Some potters went forward to pull her but the maid told, "Don't dare to touch begum". The maid tried heart and soul to get up her begum but failed. After half an hour, the train started and begum became separated into fleshes. Now where is her burkha and purdah. [………] after 11 hours, she left her body. What a brutal death!" (Rokeya: 139)

Wealth is not important to the women but the important is chastity by the name of purdah. In the story no. 15, women were shaking when the door of the house was being knocked. They thought it was thief. So, they wore all golden ornament so that the thief cannot seize a single of them. The most interesting thing is that instead of screaming, one of them putting on burkha opened the door. But luckily, it was a dog.

It may be described that the purdah system had transformed women into unanimated substance which has no power to scream, shouting or expressing feeling; only they can tear. Begum Rokeya continued to produce literary piece of works prolifically highlighting the necessity of providing equal education opportunity to women to establish them as equal partners in all family, social and economic affairs.

"…she considered certain social and religious customs such as purdah, zenana education or education at home and escorting girls under strict veiling from home to school and from school to home as major obstacles to their proper education. in fact, bitter criticism against the extreme imposition of veiling occupied a greater part of her writing. […….] …she also boldly worked throughout her life to eliminate the strict version of purdah, which terms as the 'purdah of ignorance' (Susie Tharu and K. Lalita, 1995, p. 340)". (Elahi: 2017)

Begum Rokeya provides satiric word sat the end of most of the stories in the novel – 'if she cannot tolerate discomfort, how will it be the brevity of womanhood? 'the ladies are not making a sound even eating the pinch of boot'; 'what a successfulness of womanhood!'; 'Ohnon-spoken women'; 'oh, she is new bride, - or elder sister-in-law,- not supposed to talk if the life gone so.'

Purdah is not a matter of seclusion or isolation; it means a matter of sacrificing. Begum Rokeya, in the story no. 3, had talked about stealing golden ornaments just 2 days before marriage of a widow's son.

"…. hearing the sound of thieves, the widow got up and sat on the bed. She made the maid woke up silently. The thieves thought that they should flee away. Some of them told that we should stop and they supposed to see the next scene inside the room. They got much fun. The maid took a piece of cloth and covered the lady. Showing the bunch to keys, she requested the

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thieves not to come close and to keep the nose ring. She confused that if they took the nose ring, how the marriage will be completed. [……….] the widow did not let the maid shouting if the men come into the room! Slandering all to the hand of thieves, she saved the respected of seclusion norms.” (Rokeya: 133)

Both communities, Muslims and Hindus, were strictly following the customs of the society. In the story no. 12, we see the same seclusion tradition. A wife holding the yellow lungi of another person who was not her husband followed the unknown man. Asking question to the wife, she answered:

“…. all time she wore veiling on her head. Shehad has not seen her husband’s face at a single day clearly. Only she has known that he was wearing the yellow color edge lungi. The lungi is of the unknown person was in yellow color so thinking the lungi might be my husband’s one, she followed him.” (Rokeya: 138)

Begum Rokeya dreamt to get complete emancipation of women from the shackles of patriarchy, in the way, she wanted the equality very peacefully between men and women through education and employment. Nobody does think about the subcontinent women, was addressed by her to the Bengal Women’s Educational Conference:

“You should be perhaps surprised to know that for the last twenty-two years I have been weeping for the most unfortunate beings of India. Do you know who are they? They are Indian women. Nobody’s heart ever wept for these beings. The sorrows or the prevention of distress to animals here and there…. but to weep for women like you, who are captives of speculation, there is not a single person in the whole of India.” (Elahi, 2015, p. 20)

The oriental characteristic has been bloomed from the above quotation that the writer was speaking in the conference. Oriental people were not modern because the educational power does not reach among them and they could not comprehend its value. In the same way, the modern technologies have been introduced, but the people of India, Muslims, did not grasp the value of education. Wearing modern garments, they remained savage and naked.

Begum Rokeya had drawn the oriental mind of women very skillfully. Opening the eyes of people, she had shown the nature and fault of the society and especially women. She criticized women’s’ minds. She frequently asked women what were their aims of life. She suspected and answered that, of course, all women would say that their aim was to become well housewives. She thanked the tendency of women to be well housewives**.** But she opposed that women were not become well housewives because becoming that, women needed education, but they did not get education. She again clarified that the society felt that women did not need education. Men were achieving schooling for hoping earning. But women did not need earning so, why they would learn.

“…thus, we supposed not thinking to earn, protecting property need not to go law court, need not to beg certificate for job, need not to pursuing the white complexion people for the title ‘King’ or ‘Empire’, or never need to face battle field for saving country.” (Rokeya: 202)

Begum Rokeya emphasized on women education to come them out from the darkness of the society to the light of knowledge. She went to collect girl’s door to door. Observing the mental situation of the women, she used a term ‘Mental Culture’ which is needed not only to be a well housewife but also to be a well fighter. She formulated that cultivation of education is essential for ‘mental culture’. She confessed that most of the women had not known where a garden to be grown; where a kitchen to be built etc. would be chosen by herself, nevertheless, she was a housewife. She raised question about the women, how many of them knew those things.

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"…we are such housewives that do not understand about house even! We are in fault at the very beginning…. after building a building, we want utensils." (Rokeya: 203)

She suggested us to overcome the oriental culture and set up the mental culture by education. That we belonged to the orient culture is clear by the following sentence. The key of our orientalism is illiteracy.

"…understanding power of arranging all, where it is suitable, is very necessary." (Rokeya: 203)

Without a well-organized aim, nothing can progress. The thing must creep and it will take more time than usual. Reaching to her goal, Begum Rokeya established Sakhawat Memorial Girl School by her husband's name in Bhagalpur but at the face of male protection she could not continue the school. Next, she came to Calcutta and again established Sakhawat Memorial Girls' High School with eight girls. She never felt hopeless. The result of her hard labour is the emancipation of women in every field of life. Now women are getting job home and abroad. They are getting higher education from the top educational institutions. They are being gotten empowerment and are contributing in the growth of economic development of the country. Now women are looking shaping their own lives, households, communities, and nations despite the restrictive gender ideologies and practices.

Edward Said W. indicated in his writing that 'orientalism is the geographical phenomena. It also includes social, cultural, economic and vocabulary words' (1979). On the basis of these characteristic, Indian subcontinent is, of course, an oriental country. Begum Rokeya had written *Abaradh-Basini* in 1929 and arose some untold issue of the contemporary society. Later, Edward Said's observation is the result of Orientalism (1979). In the modern study, the facts are read as well as are formulated a term what had been said before. Ignorance of education, Indian subcontinent could not give its name that Edward Said had given.

"…they cannot represent themselves; they must be represented. - Karl Marx" (Said, 1978, p. 9)

The quotation of Said from Karl Marx rightly serves for the Oriental fellows in the Indian Subcontinent. In "Soauro Jagat", the Solar System in English, Begum Rokeya mentioned the eagerness of education and frightened of male figure by a 12 years girl, Rabiya:

"…to see his eyes, I become afraid. Now he has come, only protect us to go to school!......I myself must go to school…. we three will take admission in Technical School" (Rokeya: 257)

Referring an Urdu newspaper, Begum Rokeya said if the Bengal newspaper was not able to publish the news about women, that is to say, there remained no limitation any more for the grief and sadness of women. So, in the patriarchy or men leaded society seized the right of the speech of women. That is why; the peaceful ladies revoked the pen to delve fates by their own hand. The result is that restriction gathered more inside the family than outside. They were neglected from their basic rights. They had been refused, or persuaded, from the share of father's property. The system of dowry was being rapidly practiced from then.

Brutality is a chief and existing feature of orientalism. In Orient, brutality comes in the name of marriage of adult girls. Although marriage is a legal social conduct of production of child, it keeps the world civilization exist too. But in the early 20th century, we see that brother or brother-in-law denied sharing property with another sister or brother-in-law. Either they got married his sister with a person who is addicted or unable to understand sharing the properties.

"…afin addicted, gajakhor, illiterate, forever old patient –person who could unable to sort out land sharing has been engaged to marry of the girls. Or before their marriage, the girls have been written 'LA/NO' sharing of property to brothers or the sisters are kept remain ever virgin.

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If in a family there was no son, only have dozen or half a dozen of daughters, the eldest sister's fortunate husband tries to keep the other sisters-in-law unmarried. [……] Hai's father Mohammad (SM)! You gave right in our father's property, but your clever followers are ruining in various ways." (Rokeya: 226)

Keeping a great faith for Islamic laws in the heart of Rokeya, she undoubtedly told:

"…the blessing of Islamic Laws kept in the Scripture with the blissful painting of pen. Whose money; whose power; their laws are implemented; laws are not for the illiterate people like us". (226)

So, it is very much clear to the writer that illiteracy is a curse. The result of this curse is suppression, brutality, cheating and disowner. In this regard Benjamin Disraeli wrote in the novel Tancred:

"…the East is a career." (Said, 1979, p. 9)

From the above quotation, it is very much clear that Occident did not come to our Indian Subcontinent aimlessly. They came here to get development. They came to seize the wealth. So, what they are doing nowadays is clearly for better career; better country; better life with killing lives.

"…the Orient was almost a European invention, and had been since antiquity 'a place of romance, exotic beings, haunting memories and landscapes, remarkable experience. The main thing for the European visitor was a European representation of the Orient and its contemporary fate. (Said, 1979, p. 9)

As the East countries were prosperous and wealthy; the next statement gives its prestige.

"…the Orient is not only adjacent to Europe; it is also the place of Europe's greatest and richest and oldest colonies, the source of its civilizations and languages, its cultural contestant, and one of its deepest and most recurring images of the other. In addition, the Orient has helped to define Europe (or the West) as its contrasting image, idea, personality and experience. (Said, 1979, p. 10)

They thought that Orient is a better place for romance too. They also thought if they could portrait a comparison with the savage Orient, they will be accepted as civilized human beings.

"…orientalism as a Western style for dominating restructuring, and having authority over the Orient." (Said, 1979, p. 10)

Begum Rokeya revealed against her society for the same reason and mentioned that only men were not able to win over well armed dominating agent, British. So, women education is needed. They could help the men in the real-life situation. Keeping half to the population behind the light of education how a society properly could run, she asked. Rokeya showed that women were intellectual in her time. They could do some new thing that would assist men for progress of their ideas. She had dreamt that once women would control the country.

"…an elephant also has got a bigger and heavier brain than a man has. Yet man can enchain elephants and employ them, according to their own wishes?" (Rokeya: 529)

They would have the ability to invention. To prove her views, she wrote *Sultana's Dream* where she kept men inside the room and women were governing the country. The country governed by women was running well. No enemies were there. As Said had referred from *en soi*:

"…we ought to have recourse to this science of compassion, to this 'participation' even in the construction of their language and of their mental structure, in which indeed we must participate: because ultimately this science bears witness either to verities that are ours too, or else to verities that we have lost and must regain. Finally, because in a profound sense everything that exists is good in some way, and those poor colonized people do not exist only for our purposes but in and for themselves." (Said: 271)

Although the people of colonial countries were not poor in wealth but they were poor in their mental construction in the respect of education. They avoided Christians' education because the Christian people had defected and had broken the unity among all religious performers in the subcontinent through the defecting Nabab Siraz Uddawla in 1757. The British came here for business and observing the poverty, uneducated people and the culture of the Indian Subcontinent, they used their arms. Mental construction of colonial people was right for the British that the British could seize our treasures and could transform the people from their religion showing wealth. Actually, the British thought that they were civilized because they had invented modern armors to overcome any opposition on that time where bamboo made armor could not make any harm to them. So, Begum Rokeya felt the essence of education for both men and women especially women who pass lazy time at house. She thought that oriental mind should have been changed for the essence of abolishing British reign. The result of her thinking is *Sultan's Dream* which result is that women invented a balloon with some pipes so that they could make rain from the cloud and could get the water. So, there was no mud in the ground. This invention did not come from the brain of men. It came from women. That is the reason nobody could avoid women in the growth of society and except them banishing Oriental issues is quite impossible.

Begum Rokeya opposed the illiterate issues but nowadays the critics consider those as Oriental issues. Oriental is a business itself as D. H. Lawrence made a term 'mother fixation' to defend himself. Likely the Westerns faultlessly developed the issue Oriental as 'the Eastern is a career'. People wanted to differentiate themselves and formed a collective noun, Eastern and Western. It is confessed that they had developed themselves when the Eastern people were busy with giving birth to their child. Begum Rokeya told the development by equal right between men and women. She worked for this view walking door to door. But then she became little success when her views dominate the whole world. Women are getting jobs from the lower level to the highest level, even as the Prime Minster of a country. If the people, before and after her time, understood the necessity of women education and respected the women's intellectuality, the name of Oriental would be tuned into Occidental and beyond.

WORK CITATION

1. Eckert, Penelope and McConnell-Ginet, Sally. Language and Gender. Second Edition, Cambridge and New York: Cambridge University Press, p. 2 web.stanford.edu/~eckert/PDF/Chap1.pdf

2. Elahi, Eliza Binte. "Begum Rokeya Sakhawat Hossain and Her Vision of Women's liberation in Sultana's Dream". International Conference on Language, Literature, Culture and Education 24^{th} & 25^{th} March, 2017 pp. 98- 100. Web.proceedings.icsai.org/7icllce/7icllce-051.pdf

3. Hassan, M Mahmudul. "Writing from the Margins: Multiple Subalternity of Rokeya Sakhawat Hossain". Vol: 12. No: 2. Asiatic: Dec, 2018 www.academia.edu/38062185/Writing_from_the_Margins_Multiple_Subalternity_of_Rokeya_Sakhawat_Hossain

 ISBN: 978-81-952196-0-5

4. Hassan, M Mahmudul. "The Bluestocking Salons of Eighteen-Century Britain". The Daily Star. Dhaka. Saturday 29 September 2018. Print. Web. www.thedailystar.net/literature/news/the-bluestocking-salons-eighteenth-century-britain-1640020
5. Kha, M. R. "Radical Bengaligenius (Mowlik Bongo-Protiva)". *Mashik Mohammadi*. Dhaka, UP, 1339. p. 267. Print.
6. Quayum, Mohammad A. *The Essential Rokeya: Selected Works of Rokeya Sakhawat Hossain (1880-19321).* Ed. Trans. Leiden. Netherlands: Brill, 2013
7. Rokeya, Begum. *Begum Rokeya's Rochana Sangraha*. "Avarad-Basini". Dhaka: UP, 2017. pp. 131-140
8. Rokeya 202-257.
9. Rokeya 592.
10. W., Edward Said. *Orientalism.* Routledge & Kegan Paul. London and Henley: 1978. pp. 8-13
11. W., Edward Said. *Orientalism.* Vintage Books, New York: 1979. p. 271
12. W. Edward 4-5

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POLICY PERSPECTIVES AND PRESENT STATUS OF INTERNATIONALISATION OF HIGHER EDUCATION IN INDIA

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INTRODUCTION

The Prime Minister, from the fortifications of Red Fort on 15th August once announced that Indians should think proactively on several fronts. Among them was the question -- why can't India excel within the world in the field of education. That's indeed a brand-new thought. Even when we talk about higher education's globalisation and internationalisation, we don't think about "exporting" education or education services since we associate exports with commodities rather than services. But it's a time to begin doing so, especially in education. India has experienced brain drain for last a few years now we can think so as India has the potential to become a world hub in this field. Students from south-east Asian nations and African sub-continent have already started heading towards our shores but the numbers are still small. (Trends in Internationalization of upper Education in India-2014)

According to UN agency data (UIS, 2018), approximately 5.09 million students crossed national borders to pursue educational activity in 2017. From underdeveloped to developed countries is the most prevalent direction of cross-border student movement. A gaggle of 9 countries in North America and Western Europe still are favourite destinations for several students. They host approximately 60% of cross-border students, with East Asia and the Pacific region accounting for over 20% of international students. It looks there is a rise each inside the amount and share of students moving to East Asian countries (UIS, 2018).

India's information throughout this field is unbelievably hardscrabble compared to its potential. Indian students abroad are acting remarkably well. Indian college teaching or doing analysis in foreign universities is in addition extremely admired virtually in each conceivable academic arena. These figures demonstrate that the Indian educational environment is capable of attracting a substantially larger number of overseas students than the current situation. The promise of earning more money through foreign academic experience; new types of transnational teaching; and the specific political and economic circumstances that changed the link between teaching, societal demand, and the labour market. Some Indian universities, IITs, IISc, BITS Pilani have found an area within the global ranking of universities. (Mahapatra,2019)

INTERNATIONALIZATION OF UPPER EDUCATION POLICIES AND INITIATIVES

NKC (2007-2009) recommended to formalize collaboration with foreign institutions and researchers. Collaborative programs with foreign Universities and research institution will encourage faculty and students to communicate and exchange ideas and practices on latest developments. Visa procedures for research exchanges should be simplified. The post of educational attaches in various consulates should be created and filled. They will play a crucial role in facilitating scientific exchanges between countries, additionally, this may also provide an alternate employment avenue for people with research background. Multiple entry provision for foreign researchers would also benefit frequent collaboration by considerable reduction within the hassles of obtaining visas.

Yashpal committee report (2009) One should limit cognizance to the very fact that universities grow in organic reference to their social, cultural and geographical surroundings and even the most effective of them cannot be transplanted some other place and expected to try and do likewise. Interaction with the simplest minds of the globe would only enhance the standard of our universities. If the simplest of foreign universities, say amongst the highest 200 within the world, want to return here and work, they ought to be welcomed. Any decision during this regard must be taken with utmost care keeping in mind the features, which are essential for an establishment to be called a university. Such institutions should give an Indian Degree and be subject to all or any rules and regulations that may apply to any Indian University.

Twelfth five-year plan (2012-17) includes a spread of reforms geared toward improving the educational experience in HEIs. These include reforms in institutional organization reforms of pedagogy and curricula, particularly at the undergraduate level; and attention on faculty and their work. These reforms would be supported by smarter use of technology, initiatives to market internationalization, the fostering of social responsibility in education, advancement of sports and health, increasing inter-institutional collaboration and coordination, and establishing the accreditation system. Promote internationalization by encouraging and supporting institutions and their faculty to interact more deeply with institutions and school round the world in areas starting from teaching–learning to research and outreach.

RUSA (2013) recommended that Indian Universities enter into strategic partnerships with their international counterparts so as to facilitate various exchange programs that allow the sharing of ideas, experiences and research without overtaxing existing infrastructure, together with Faculty Exchange Programs as outlined above which, it's also been noted that an outsized number of distinguished faculty abroad is of Indian origin. The practice of inviting them to show for a semester or maybe to deliver lectures whenever they're in India should be encouraged. Since technology is fast changing the way we expect about communication, the potential of using tools like Skype for long distance academic collaboration should be explored. Additionally, young and mid-level faculty must be provided opportunities to travel abroad either on short term teaching assignments or research or syllabus formation projects. This is often because faculty is the key to implementing the policies on internationalization of Higher education and its exposure to different universities is required for the aim. Thus, the impact of internationalization is seen on various factors of education.

NEP (2020)

NEP 2020 has initiated change within the policies associated with education and internationalisation in educational activity to arrange an enormous space for college students to the various initiatives mentioned:

- It can facilitate in having larger numbers of international students learning in Asian country, and supply bigger quality to students in Asian country. It will provide a platform to the students who may not travel to, study or, think of transfer credits, or perform researches in the institutions abroad.
- Courses and programmes in subjects, like Indology, Indian languages, AYUSH systems of medication, yoga, arts, music, history, culture, and fashionable Asian country, internationally relevant curricula at intervals the sciences, social sciences, and beyond, evocative opportunities for social engagement, quality residential facilities and on-campus support, etc. area unit fostered to realize this goal of world quality standards, attract bigger numbers of international students, and succeed the goal of 'internationalization at home'
- India is promoted as a worldwide study destination providing premium education at cheap prices thereby serving to revive its role as a Vishwa Guru.

- A Global Students workplace at every HEI hosting foreign student's area unit supported to coordinate all matters concerning hospitable and supporting students strolling back from abroad.
- Research/teaching collaborations and faculty/student exchanges with high-quality foreign establishments ought to be expedited, and relevant mutualist MOUs with foreign countries ought to be signed.
- High performing Indian universities are boosted to line up campuses in another countries, and equally, particular universities e.g., those from among the best of hundred universities in the world are to manage in Asian country.
- A legislative framework facilitating such entry would be in place, and such universities would be given special privilege concerning rules, governance, and content.
- Furthermore, research collaboration and student exchanges between Indian institutions and global institutions are promoted through special efforts.
- Credits acquired in foreign universities are going to be permitted, where appropriate as per the wants of every HEI, to be counted for the award of a degree.
- The number of Indian students abroad increased by 5.2 times – from 66.7 in 2000 to 305 thousand in 2017– accounting for a mean annual rate of growth of 9.4 per cent. With over 305 thousand Indian students studying abroad, India is that the second largest student-sending country after China. Four countries, namely, USA, UK, Australia and Canada accounted for 73 per cent of the Indian students abroad in 2000 and therefore the same countries account for the identical share in 2017. However, the relative share of scholars hosted by these countries changed during this era – the total share decreased from 59 per cent to 45 per cent just {in case} of USA; increased from seven to fifteen per cent in case of Australia; one to seven per cent in case of Canada; and remained stable at six per cent in case of the United Kingdom (Choudaha, 2019).
- These changing trends in Indian student flows indicate an in-depth association between choice of study destination and immigration policies followed by the countries. Initiatives to draw in students.

Taxila or Takshashila the world's first university was founded in 700 BC. over 10500 students from everywhere the planet have studied here. Students from Babylonia, Greece, Arabia, and China had campus facilities and there have been 60 different courses in numerous areas. that the students from different countries are interested in India, Indian culture and Indian education from ancient age.

Many programs were previously started and also are newly launched. A programme was launched in 2017-18 to draw in foreign faculty members to show for brief durations in Indian universities. the Global Initiative for Academic Networks (GIAN) attracted around 1800 scholars from 56 countries to supply courses in 2017-18 and 2018-19. In its extension in GIAN II, the govt. intends to market mobility of Indian faculty members to show within the universities abroad. Several programmes like 'PM Scholars Return to India' are initiated to bring back Indian scholars settled abroad. this may increase the amount of internationally trained professors offering courses in Indian universities. Similarly, the Scheme for Promotion of Academic and Research Collaboration (SPARC) is launched in 2018 to push research collaboration between reputed institutions abroad and Indian institutions. The collaborations with foreign universities help internationalization in several ways. The institutional collaboration enhances academic credibility of domestic institutions, increases the number of international publications of Indian faculty members, gains international exposure and skill which self-pressures to take care of international standards in teaching and research, and helps developing a comparative perspective and enhanced analytical competencies, of these will definitely contribute to boost quality of Higher education institutions in India. India developed its MOOC platform Study Web of Active Young Aspiring Minds (SWAYAM). The SWAYAM courses are offered to foreign studentsin the same manner as open universities within the UK and also in Republic of South Africa. SWAYAM has the potential to draw in enrolment of foreign students in large numbers.

The MHRD recently unveiled an inspiration to push “Study in India” scheme. The goal is to draw in about 200, 000 students from foreign countries for enrolment in Indian Universities by 2022-23. it's quite fourfold this strength of foreign students in India, which is about 45,000. But the target is somewhat too truncated. With over 900 universities and nearly about 50,000 colleges and better educational institutions, India certainly can do more and must aim high.

PRESENT STATUS OF FOREIGN STUDENTS IN INDIA

According to AISHE report (2018-19) the increased number of higher education institutions is as below:

Table-1

Higher education Institutions	Total Number
993	Universities
39931	Colleges
10725	Standalone institutions

Thus, as the number of institutions increases the number of foreign students has also drastically increased. The total number of foreign students enrolled in higher education is 47,427. The foreign students come from 164 different countries from across the globe. The top 10 countries constitute 63.7% of the total foreign students enrolled.

Share of neighbouring countries in development of higher education is premier in India. The following table states the details of the same.

Table -2 Country wise students studying in India

Name of the country	**Percentage**
Nepal	26.88
Afghanistan	9.8
Bangladesh	4.38
Sudan	4.02
Bhutan	3.82
Nigeria	3.4
USA	3.2
Yemen	3.2
Sri Lanka	2.64
Iran	2.38

Currently, the highest number of foreign students according to the Confederation of Indian Industry (CII) (2019), approximately 25,000 are African students are studying in 500 public and private universities in India. However, there's a possible to boost openings of scholars from Africa within the country. Further, a number of the opposite factors encouraging students from

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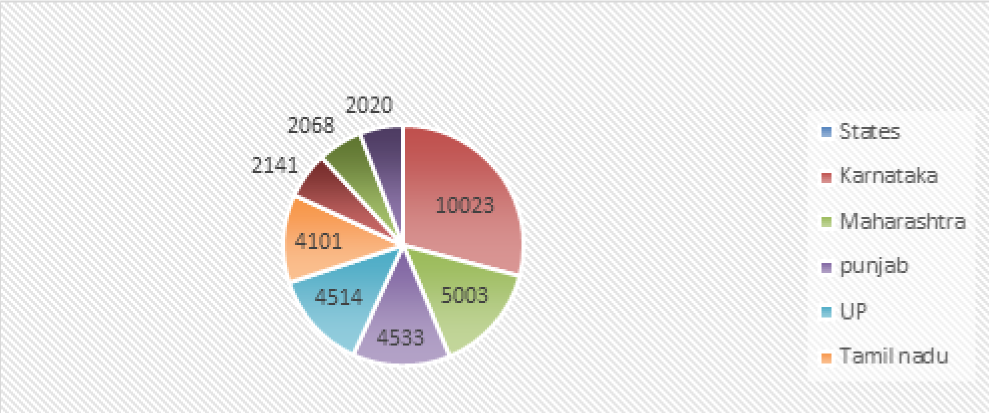
Africa visiting Asian country four-sided measured the existence of a lot of honoured, older and a lot of developed instruction sector. The highest number of foreign students is enrolled in Undergraduate courses, that is, 73.4% of the total foreign students, followed by Post Graduate with about 16.15% enrolment.



Graph-1 State wise enrolment

Table-3 Programme-wise Enrolment number of foreign students

Program	Total No. of students	Male Percentage	Female Percentage
B.Tech.	8861	85	15
BBA	3354	71.1	29.9
B.Sc.	3320	62.9	37.1
B.A.	2226	50.1	49.9
B.E.	2576	85.3	14.8
B.Pharm.	2498	69.45	30.55
BCA	1873	83.02	16.98
MBBS	1429	41.08	58.92
BDS	738	40.5	59.5
B.Sc. (Nursing)	1174	7.87	92.16
BBM	338	67.15	32.85
MBA	1574	67.34	32.66
MA	1486	67.36	32.64
M.Sc.	1391	71.3	28.7
Ph.D.	1560	76.6	23.4

The government of Republic of India launched a program still named Global Initiative of Academic Networks (GIAN), the foremost purpose of this program is that the promotion of scientific and technological capability to develop world excellence. As a part of it, Indian universities reserved ten seats for foreign students adding to as five per cent for NRI/PIO students. Similarly, the UK-India Education and Research Initiative (UKIERI) was launched in Gregorian calendar month 2006 and its main goal is to bolster the tutorial link between India and additionally the United Kingdom. The Indian government has launched 'Study in India' to attract additional international students to native universities. In the year of 2016, their number measures 47755 foreign students however the Indian government's main goal is to form 2 lakhs at intervals of following 5 years; in comparison to China's 4.4 million foreign students in 2016. Once dominated by the USA and United Kingdom, China is the third rank in terms of international students. Republic of India remains among the very best 5 destinations for African students. The Indian government has recognized the necessity for making HEIs accessible to African students by creating it affordable. The theme can waive the fees to benefit students; a replacement initiative the government of Republic of India is endeavour which could facilitate the African students to prerequisite advantage.

The NEP 2020 envisages manufacturing globally competitive and nationwide grounded university graduates. The new initiatives like GIAN and SPARC might facilitate promote internationalization response by the foreign trained professors and by establishing collaborations with foreign universities, by revising curriculum to create it globally relevant to produce globally competitive graduates from establishments of higher education in Republic of India.

CONCLUSIONS

The collaborations with foreign universities help internationalization in several ways. The partnership with international institutions enhances academic integrity of National institutions, increases the quantity of international publications of Indian faculty members, gains international exposure and knowledge which inspires to take care of international standards in teaching and research, and helps developing a comparative perspective and enhances critical competencies of these will definitely contribute to reinforce quality of upper education institutions in India. No country within the world can remain isolated from global developments in knowledge construction and academic influences they put forth on national education systems. Knowledge is produced nationally but shared globally. Therefore, there's a requirement for Indian education institutions to stay globally connected and engaged. International collaborations and cooperation in knowledge production and its sharing become a crucial step towards enhanced visibility to achieve international academic credibility. The foremost challenge, India faces, is about the standard of higher education institutions. As per the statistics, it's visible that the quantity of scholars joining Indian education institutions is increasing day by day.

NEP 2020 envisions India as a vishwa guru whereby a greater number of scholars are interested in the Indian teaching Institutions. Thereby, India is prepared to simply accept the challenges with this policy of internationalisation. The aim of NEP 2020 is principally to specialise in collaborations with different foreign universities associated with teacher, student exchanges, research and innovations. For India making informed and inventive choices about internationalization with a transparent sense of the interplay between risks and benefits, opportunities and imperatives, obstacles and resources requires unique skills and abilities, real vision, and sustained commitment may be a challenging task today.

The recent policy will surely help the state in augmenting and strengthening the capacity to supply more faculties and students in selected fields through such partnerships and will help public universities play a significant role in assuring quality in Higher education institutions. This approach, however, will concern strategic investments by governments in these universities and to obtain the services of the foreign partners.

REFERENCES:

[1] Qiang Z. (2003) Internationalisation of Higher Education: towards a conceptual framework, Ontario Institute of studies in Education, University of Toranto, Canada.

[2] Report on Trends in Internationalization of Higher Education in India (2014) Confederation of Indian Industry (CII) and the Association of Indian Universities (AIU), New Delhi

 ISBN: 978-81-952196-0-5

[3] J. Knight, CII-AIU, Changing Landscape of Cross Border Higher Education. Trends in Inter nationalization of Higher Education in India, 2014, p38. Retrieved on ... https://www.researchgate.net/publication/303683678_Internationalization_of_Higher_Educat ion_in_India_Pathways_and_Initiatives (https://www.researchgate.net/publication/

[4] Ministry of Human Resource Development, Government of India 2016-17. https://en.wikipedia.org/wiki/Ministry_of_Human_Resource_Development. Date accessed: 16/07/2019. 7.

[5] All India Survey on Higher Education 2017-18. https://epsiindia.org/wp-content/uploads/2019/02/AISHE2017-18.pdf. Date accessed: 2018.

[6] All India Survey on Higher Education 2018-19 http://aishe.nic.in/aishe/viewDocument.action?documentId=262

[7] Sajna.V (2019) Internationalization of higher education in India: initiatives, trends and perspectives, Indian Journal of Economics and Development, July 2019, Vol 7 (7)

[8] Varghese N.V (July, 2020) Internationalisation of Higher Education Global Trends and Indian Initiatives, National Institute of Educational Planning and Administration, New Delhi

APPLICATION-BASED FITNESS TRACKER AND GUIDE

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ABSTRACT
With the advent of technological advancements, the world witnessed surge in various tech-based hardware supported internet applications and within the last few decades the technology has shown a substantial increase. Most of the businesses are making technology-centric user products. Moreover, the data-driven growth of the businesses includes latest technologies such as artificial intelligence (AI) and machine learning (ML). In addition, the adoption of data storage technologies has been increasing every day. The rising internet mediated applications such as smart-wear technology has also seen an upward shift. There are highly dynamic features with the help of AI/ML the smart-wears can do more than before. The applications on the other hand are trying to cover all the aspects of the features which add on every-day. This paper covers all the major features a web-application should have as a mixture of all health-based applications. The study intends to elaborate on the necessary aspects of the smart-wear applications which include all health-related concerns (Physical/Mental). Furthermore, we have created a prototype to test the applicability of this web application which contains a section on mental health where people can learn how to stay mentally fit and what to do to achieve better mental health.

Keywords: Health Tracker, Tracker Web-Application, Tracking systems, Artificial Intelligence and Machine Learning, Exercises, Mental health.

INTRODUCTION
The spread of the COVID-19 pandemic resulted in nationwide lockdowns and social distancing norms. This has led to a transition to virtual fitness from traditional studios and gyms [1]. This, in turn, has increased downloads and usage of fitness apps [1] [2]. According to an article published in the World Economic Forum in September 2020, the global downloads of fitness and health apps increased by 46%.[*] This increased usage rate of fitness apps due to a growing trend of online fitness training is driving the market globally. The growing awareness regarding health and wellness is also driving the market".

The hardware is in the race too as it serves as the other end, according to fortune business insights "The global fitness tracker market size was valued at USD 30.41 billion in 2019 and is projected to reach USD 91.98 billion by 2027, exhibiting a CAGR of 15.2% during the forecast period.[†] For Instance, according to the Pew Research center, in 2019, one in five Americans regularly use a fitness monitoring device."[‡]

[*] https://lifestyle.livemint.com/health/fitness/five-great-fitness-apps-to-keep-you-fit-and-strong-at-home-111602783537482.html#:~:text=As%20a%20report%20released%20by,58%20million%20new%2C%20active%20users.

[†] https://www.fortunebusinessinsights.com/fitness-tracker-market-103358

[‡] https://www.pewresearch.org/fact-tank/2020/01/09/about-one-in-five-americans-use-a-smart-watch-or-fitness-tracker/

There are plenty of web-applications available on Internet today to help any kind of problem and for any age group, but the problem comes with the interaction, since the web-applications are more of content-based and not interaction-based [3]. People label the web-applications as personalized but they are not, personalized web-web-applications are more innovative and are highly interactive and the web-application will be customizable and will allow the user to use it as one want [4]. The only application that cannot do the whole job is only one half of the other half will be covered by the tracking device which will enable the user to check their stats. Today, fitness bands and fitness watches are very famous and they have become the ultimate way to track your health for all means. So, we have two ends one is the hardware and the other one is the software, but the hardware even consists of the software which is called the firmware, and that firmware regulates the hardware and connects the hardware to the software. People are so afraid of diseases now that they have started using these continuous trackers so that any irregularity will be noticed. Ubiquitous healthcare technology systems and processes is healthcare anywhere and people are accepting this at a very fast rate [5] [6] [7]. People with long term diseases find this technique a lifesaver as they have to consult the Doctors today and they also have to go for frequent check-ups, but now with the use of highly advanced sensors [5], they can do this on their own and also can check if there is any sort of risk or not.

LITERATURE REVIEW

Extant literature has covered features that will influence people to adopt the Fitness trackers [8]. The researchers also identified that a large number of people are willing to stay fit but they need to pay for the mentor or buy a plan so that someone can guide them to a better shape [9], also the old age group which is helpless that means even if they want to pay, they can’t get out all the time and to the physical exercises. This web-application will just replace the person who is guide or mentor and give the user a fitness environment that they can access at home. As we know the current scenario, the world is tackling COVID-19 and most of the nations are in quarantine including India and due to this people are getting enthusiastic about utilizing the free time to do something productive and hence via this research, we want to start a change by providing all necessary details about physical exercises, yoga, stretching, a daily walk and run tracking and all that needs to be done to stay fit [10]. This study on necessary features become utmost important. In this study, apart from young users, we are also focusing on the old age group who are limited by the disabilities which come with the age, that age group also can stay fit but they can’t go to the gym or any fitness center so will be using a home- based web-application so they can take a step towards a fit life regardless of the number [11]. In this research paper, we will be discussing how the whole process of home-based and non-home-based training, mental health training, specific training is done and about all the components that are needed to track your health, and what steps will you take to drag the number back to position. We will be covering both aspects that is the hardware which is needed as physical trackers, and the software that will analyze and suggest the best fitness plans. Many people want to do something, but due to lack of knowledge, they don’t find it worthy so this web-application will contain many aspects and will cover every detail specified to each person, it will also track the improvements by the user with the help of the FIT+ TRACKER.

METHODOLOGY

The rigours data scrapped from the reputed journals and websites. In order to validate the results, we have conducted in-depth research across users and then identified the features and after that we characterised them all. The research paper is totally evidence based and is outcome of vast information gathered through different modes, all the modes are authentic and was previously used in other papers.

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First, we searched for various topic related keywords such as “Fitness Trackers”, “Heath Tracker”, “Fitness websites”, “smart watch applications”, “Fitness based web applications”, “Health Guide applications”, “Evolution in fitness applications”, “History of Fitness applications”, “Evolution of health tracker applications”. Later did an extensive literature review of more than 70 research papers related on these topics and we analysed the outcomes deeply by creating a word cloud. After analysing all of them we interviewed different people and also random age groups for triangulation approach [12]. We brainstormed all the reports and then characterised the data and inherited all in this report. Additionally, we seek credible marketplace evidences which have a substantial market share. Furthermore, we attempted to further segregate features into broad category data and connectted it with the pre monitored stats.

MODELING AND ANALYSIS

The data collection from the extant literature, popular press articles, and interviews has given us directions to initiate the process which starts with the sensors that collects the physical data. The sensors are fitted in a watch or fitness band and the data is then sent to the web-application or the server to which it is connected. The web-application FIT+ TRACKER will act as the server to the data and will show the user the data and will help the user to evaluate the data and even share. Unrefined data from sensors ought to be changed over into sound estimations to be huge for the customer. Various contraptions just introduce a confined course of action of estimations directly on the device (eg, the current development count or current HR) and rely upon going with convenient web-application to show the full extent of available estimations (eg, significant step by step check and distinct HR data). Yet the genuine sensors in these devices are essentially the very, the computations that unravel sensor yield are astounding for most dealers. These estimations are routinely associated with insider realities, and they can be changed without notice. Moreover, the quality and maintained features are going with flexible web-applications change, and the full-scale customer experience will consequently differentiate. Every additional sensor associated with a contraption can be used to add such estimations for the customer or supply inside figurings with additional data to improve the precision of adequately available estimation types. Regardless, additional sensors impact cost and power use.

The web-application proposes four different aspects of itself out of which the user can decide what he/she wants to use and whatnot.

Physical health tracker

In the health tracking unit, the user can see the data scanned by their devices and will evaluate it in the web-application. Users can see the comparison and the user can also check real-time readings such as BPM, Spo2, temperature, etc. on the app itself. These readings are not done by the web-application but are done by the device it will be connected with and will only evaluate the data and present it to the user in a super interactive mode and will provide different comparison modes such as comparing between dates and also, they will be provided a general range which is the normal range for that particular reading.

Calorie’s tracker

In this aspect the user may use the web-application as a fitness tracker where they can monitor their calories, distance covered while walking, jogging, running, etc. from the mobile sensors themselves. This function can also be used through the connected device, fitness devices constantly measure your steps and calories. So, the web- application when connected to the device can take data from there and only evaluate it to show it to the user. It will keep a record of what have you done in the past week all along.

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Diet

The web-application can also act as a diet plan suggester as it will help you reach your goal by making you a good diet plan. It is the best app for fitness lovers and also for people who have food limitations. The web-application will take the input from the user as to what food have, they have eaten and in what quantity and will then denote the vitamins, the number of calories that the food contained. In this way, the user can judge if he/she is going in the correct direction according to the activity goal or not.

Mental Exercises

This is another very important feature of the web-application, the 'Mental Fitness' is obviously after COVID a major issue with all the people and everyone is concerned about it. The web-application will help the user stay calm and mentally stable and happy. The web-application will use 432Hz meditation music and will contain mental exercises including YOGA and meditation to gain the best results.

Exercises

This is the main purpose of the web-application, to guide people who will get fit but don't know how to start and from where to start. The web-application will have a systematic set of exercises that will be divided based on their usage like stretching, gym exercises, workout sessions, cool down, etc. If the user wishes to see exercises to train biceps, he/she can go to that section and check.

Comparative study

We went through many web-applications available on the play store/app store and also the fitness watches they support and concluded that the total number of fitness web-applications available surpass 5 million in 2021, which was 2.8 million in the last recording. So, here you can see the instant rise in the market and it is almost doubled within a year. With this pace, the competition is increasing and it is becoming tougher for any start-up to stand anywhere in the line. The web-applications are ever-evolving, it all started with the first fitness application which was released in 2010, two years after the launch of the app store. Contrasted with the present offers, these first wellness applications were still basically sewed. The cell phone offered additional opportunities that engineers exploited. Unexpectedly you could take your "wellness mentor" with you for running, cycling, or climbing. Development sensors and GPS following made it conceivable to follow the specific course of the run. Notwithstanding Runtastic, various other running and long-distance race apps likewise depend on the new capacities. In the start, clients used to buy the application to use them forever. To get in touch with more clients, the designers put the application free of charge download it in the App Store about every 3 months. Numerous clients perceived these cycles right off the bat - and use to wait until it was available again to download for nothing out of pocket.

Today the business is so grown that applications are even offering free medical consultation to users and that is what shows the contrast, every app is free to download and use today, and you may pay only when you use some extra premium services. We have used many applications on daily basis for a good period and concluded that there are two types of health application. First, Fitness web-based apps that have a connection to any fitness device, second - Health web-based apps that only provides a pre-recorded set of information. The fitness web-based applications that have a connection to any fitness device are truly health tracking apps, these applications take data from the device and then evaluates it and show it to the user. These applications are more complex than other apps as they present more features such as Device syncing, Data representation, Device monitoring and settings, User-based interaction. Data based training module, the device supports multiple features such as Bluetooth Calling, Notifications, Heart rate tracking, SpO2 tracking, Temperature sensing, Step counting, Calories etc.

The applications, which do not support any device connection, offer the user a lot of pre-loaded information the application and the user can select and use whatever they wish to, in this application all the data like height and weight, etc. are taken from the user input only. The features include

Interaction Design

It is the design of the interface which will be a very tough as it is to serve to all since it will be targeting all the age groups and for this, the interface should be a universal one so that even the old age group can understand what is going on and the younger ones don't get bored while using it. The user interface should be very smooth and easy to understand. There can be many ways in which the interaction design can be deployed, the way of deployment defines the output of that design. While studying all the applications available on the internet we concluded that there are three different aspects to the design of interactive training applications:

Direction

The direction of interaction refers to the delivery of the information that is there on the application and it can further be divided into two parts. First, unidirectional denotes training programs that are only readable, these are pre-recorded exercises or any pre-loaded data that users can only see. Also, bidirectional denotes training programs which are two sided and take user feedback as input. This type of program is more interactive as compared to 'unidirectional' because it has more scope of interaction than that.

Input type

The input type is the medium through which the user interacts with the application, as the name suggests 'Input type' is the types of input and they are generally divided into three parts First The indirect input type is when the user's inputs are translated and are not directly reaching the other end. An example can be keyboard or mouse input in a computer. Second, the direct input type is when the input provided by the user is directly reaching the user and there is no other mediator in between. An example of a direct input type can a touchscreen in which the user directly provides the input to the system. The natural input type is when the user doesn't even need to take any action to provide input it's just that the system or the application will inherit the input using AI. Examples of this can be gesture recognition etc.

Training output & Problem Formulation

Training output refers to the mode through which the training output is deployed. It can be anything between text, illustrations, audio, video, or virtual and immersive environments, all these are some ways through which information can be deployed. The training output also affects the interaction and the user experience and that is why we had to take the right mixture of all outputs to be compatible with all age groups. When we are trying to achieve big, we must see the bigger challenges. With this application, we are trying to merge all sorts of applications that are present today, and also, we have to merge all the contrasting features. There are some general challenges and then there are some additional challenges that will occur in this application.

Connection & Compatibility

When a user is trying to connect their fitness device from the application it doesn't need to always connect without any failure, it is possible that some devices may not be compatible with the application and it is also possible that some devices only support certain versions of Bluetooth. The application also needs to connect to their servers and also to the internet at the

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same time. The application will be a large file and after downloading it in mobile phones it will need a good processor to run on, but not everybody will have a high-performance phone so the motto will be to keep the application and the web-based application as light as possible to let it run smoothly.

Integration & Data integration

The application will be targeting all age groups so designing the UI/UX will be a hard choice and choosing any point over another may change the agenda. So, the interface will be simple at the same time advanced. The problem also arises when we are trying to communicate with the user, the interface is not always so easy to understand and some or all users may find it too complex or too boring to use. The data taken from different devices are very sensitive and should be kept in a private space where no unauthorized network can log without permission. Moreover, the data collection in itself is a big choice the user has to choose TCP/IP and other protocols. In technical terms, we call it syncing, and sometimes due to connection issues the syncing is not executed properly which may lead to loss of data.

Sensing and Monitoring

Various sorts of instruments can be utilized to catch applicable preparing information, and at a high level we can portray them regarding: The detecting technique: alluding to how the information is gathered, from self-reported information to particular sensors (wearable or ecological), and the angle noticed: alluding to what in particular is being gathered, e.g., general action, physiological pointers, or nitty-gritty movement designs. The decision for the instrument regularly relies upon the sort of action to be performed (e.g., indoor, open-air), the perspectives to be estimated and the degree of precision required. Self-reported surveys can be utilized to ask students about their exhibition and adherence to the preparation and thereby and large active work and prosperity. Numerous applications (47% of trackers and preparing applications) depend on this instrument given its capacity to catch training- related information without the need for specific sensors. Self-report is likewise utilized in examination preliminaries because of its capacity to effortlessly gather information from countless individuals without influencing member's conduct during the analysis. Nonetheless, self-announcing is tedious and can be a complex intellectual assignment, particularly for target bunches with memory constraints, for example, more established grown-ups, which could prompt distorting. What's more, from the learner's viewpoint, entering wellbeing information physically can prompt a decrease in the use of the application Sensing advances have progressed to the point that we can wear and utilize gadgets with refined abilities. Wearable sensors, and different sorts of body-fixed sensors, would now be able to quantify markers, for example, general action, nature of rest (e.g., Fitbit, jawbone: h ttps://jawbone.com), heart rate, and in any event, breathing quality, empowering progressed observing abilities. Such target measures are alluring to get a more exact picture of the advancement in non-face-to-face intercessions. These sensors normally accompany a partner application just as automatic interfaces (API) that empower their mix with outsider frameworks. Also, built-in sensors (action tracker and heartbeat) installed into brilliant watches and on top of wearable working frameworks empower engineers to add detecting to their applications. However, just 20% of the preparation applications and 90% of trackers which we have broken down help joining with wearable or built-in sensors and the excess depends on self-report information. As far as an impression of these detecting innovations, a two-week report with 8 more established grown-ups detailed no ease of issues except for a negative change in the demeanor (in 5 members) because of precision constraints in estimating some day by day exercises (e.g., strolling in a treadmill), being awkward to wear and being viewed as an exercise in futility. Without a doubt, the degree of exactness of these gadgets probably won't deliver them suitable for all situations (e.g., clinical preliminaries), as exhibited in an examination with pedometers.

RESULTS AND DISCUSSIONS

The coding of the web-based application is done and also the application is ready to be hosted. The interface is kept simple for the ease of use and we have used contrasting colours so that it becomes catchy. We have attached some screenshots of the web-application and the coding too in the appendix.

The aim is to develop a web-based application and a mobile application, and both will be representing the same name. The mobile application will have all the aspects of the application and the web-based application will only represent the one-directional manner in which the user can only see or read the data such as yoga guide, meditation music, etc. The web-application will be quite simple to use. Here are the basic features and how to use them:

Usage as a training app

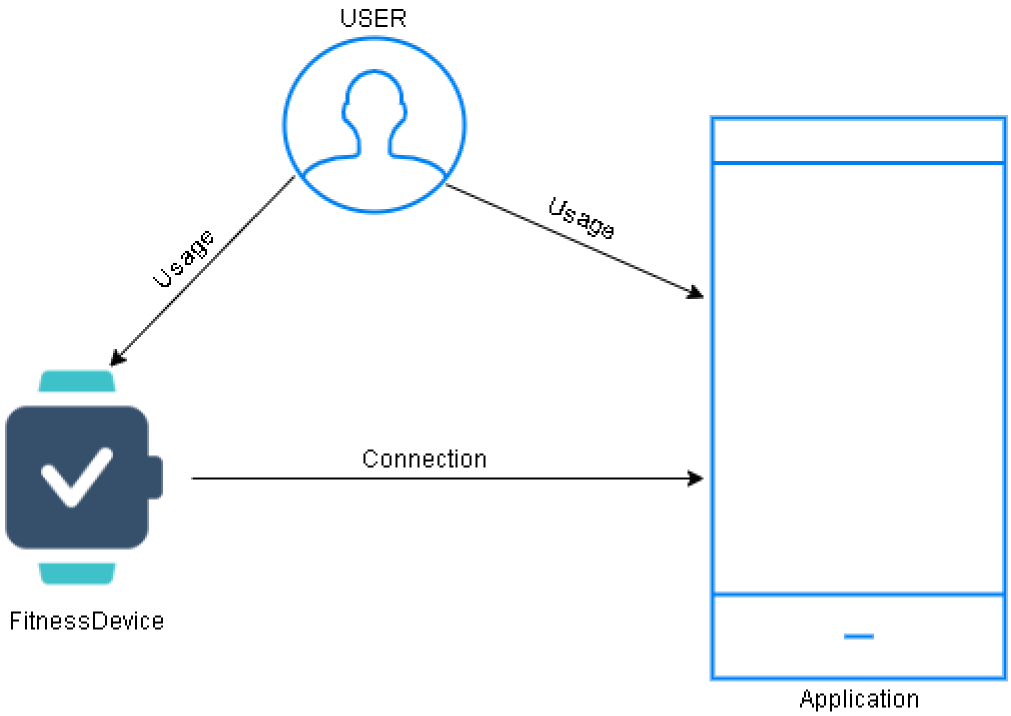
The training aspect of the web-application is pretty vast and one who wants to use it has many options and can achieve their goals through it. To do so, there are two steps, one, to start with the Login and then fill in the details which the web-application will ask you to fill and then you can go to the training section in which you will find options to either train your body through exercises or mental relaxation or yoga etc. And second, select the training you want to do and then the whole module will open up, for example, if you selected body exercises then the module will show the different body parts and their respective exercises. You can then see those instructions and follow them. If you wish to go for the yoga just select the yoga module and then look for the asanas and try to catch up with them. You can even plan your workout schedule in this module which will consist of exercises and warm-ups and their respective times.

Usage as a tracking app

To use the web-application for tracking your daily outcomes, you need to connect it to a fitness device, or else on its own the web-application can only track your steps through phone sensors. The web-application, once connected to the device it will automatically sync all the data that the device is capturing and then will evaluate and show you in a highly intractable manner. Suppose your device tracks your sleep then you can see your sleep details and also can compare them from previous days. The web-application can collect all the data and then will evaluate and show you the matrix. Through this, you can evaluate your wellness level.

Usage as mental health app

The web-application also supports mental health exercises which included relaxation techniques and if you wish to use them, just go to the module and check the relaxation exercises which include breathing and chanting, etc. and then start following them. People today are very much concerned regarding their mental health and this extra feature will help them a lot. Some fitness devices support stress tracking and if your device to supports then you can even check on to that and see how your body is reacting to stress.



CONCLUSION

The world of fitness and mobile health applications are constantly changing in a positive attitude, every day here is a new and advanced may be more secured technology is waiting to acquire the market. Merging every aspect of these applications will be a huge challenge but is doable. People are interested in upgrading themselves but are afraid of the start and people need a one-stop solution to all of their problems. Old aged people are highly concerned about their health as they suffer the most and this web-application will deliver the exact information as well as with smooth implementation. The result of this research is that there are plenty of applications available on the internet but they all serve a certain category and all of them have some drawbacks so we evaluated it and came out with the solution FIT+ TRACKER which is already in process.

REFERENCES

[1] Ananthakrishnan, Uttara M., Jenny Chen, and Anjana Susarla. "No Pain, No Gain: Examining the Digital Resilience of the Fitness Sector During the COVID-19 Pandemic." *No Gain: Examining the Digital Resilience of the Fitness Sector During the COVID-19 Pandemic (November 30, 2020)* (2020).

[2] Creese, Jennifer, et al. "“We All Really Need to just Take a Breath”: Composite Narratives of Hospital Doctors’ Well-Being during the COVID-19 Pandemic." *International journal of environmental research and public health* 18.4 (2021): 2051.

[3] Vibhandik, Robert, and Arijit Kumar Bose. "Vulnerability assessment of web applications-a testing approach." *2015 Forth International Conference on e-Technologies and Networks for Development (ICeND)*. IEEE, 2015.

[4] Baxley, Bob. *Making the Web Work: Designing Effective Web Applications*. Sams Publishing, 2002.

[5] Sodhro, Ali Hassan, et al. "An energy-efficient algorithm for wearable electrocardiogram signal processing in ubiquitous healthcare applications." *Sensors* 18.3 (2018): 923.

[6] Taleb, Tarik, Dario Bottazzi, and Nidal Nasser. "A novel middleware solution to improve ubiquitous healthcare systems aided by affective information." *IEEE transactions on information technology in biomedicine* 14.2 (2010): 335-349.

[7] Lim, Soo, et al. "A survey on ubiquitous healthcare service demand among diabetic patients." *Diabetes & metabolism journal* 35.1 (2011): 50.

[8] Kao, Yu-Sheng, Kazumitsu Nawata, and Chi-Yo Huang. "An exploration and confirmation of the factors influencing adoption of IoT-based wearable Fitness trackers." *International journal of environmental research and public health* 16.18 (2019): 3227.

[9] Karlan, Dean, and Jacob Appel. *More than good intentions: Improving the ways the world's poor borrow, save, farm, learn, and stay healthy*. Penguin, 2011.

[10] Kaushik, Meenakshi, and Dwaipayan Guha. "Resurgence of Second Wave of Pandemic Covid-19 and Its Impact on Physical and Mental Well-Being of Employees & Coping Mechanism." (2021).

[11] Morrell, Roger W., ed. *Older adults, health information, and the World Wide Web*. Psychology Press, 2001.

[12] Fielding, Nigel G. "Triangulation and mixed methods designs: Data integration with new research technologies." *Journal of mixed methods research* 6.2 (2012): 124-136.

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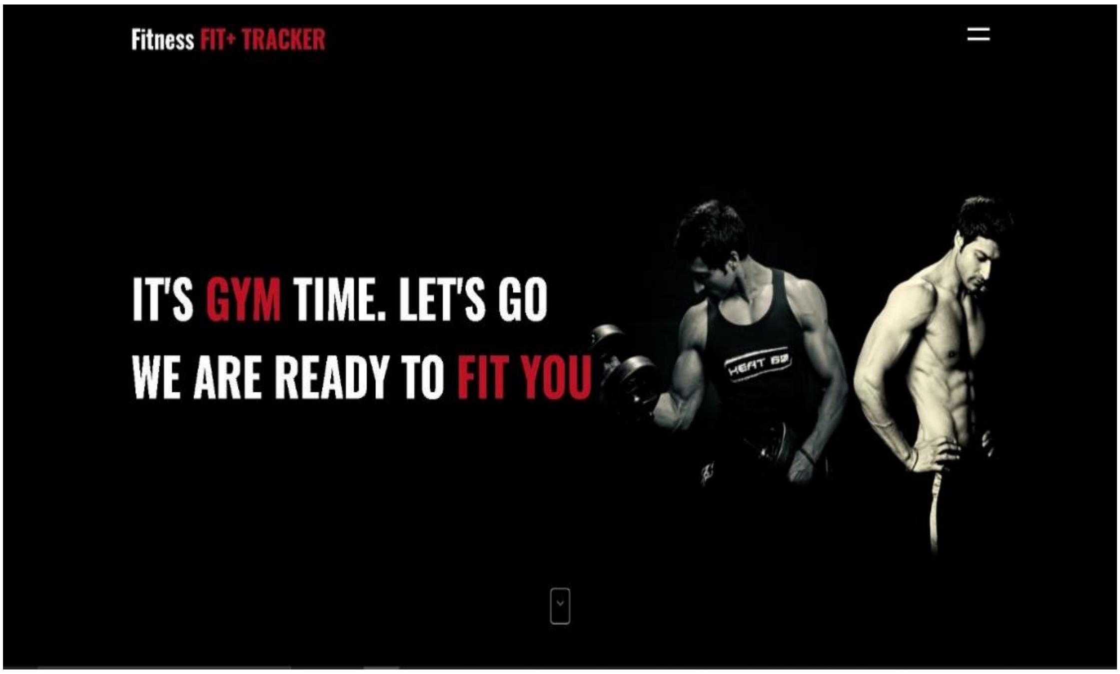
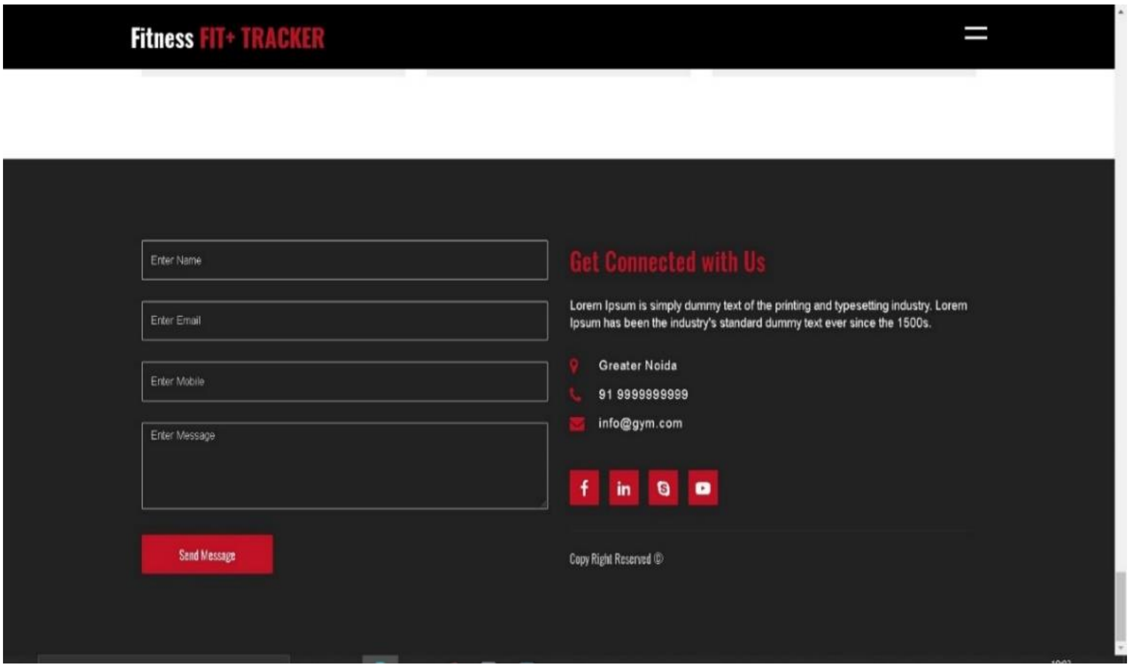
APPENDIX





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```html
<!DOCTYPE html>
<html>
<head>
        <title>Gym Website Template</title>
        <meta name="viewport" content="width=device-width, initial-scale=1">
  <link rel="stylesheet" href="css/animate.css">
        <link rel="stylesheet" type="text/css" href="css/style.css">
  <style>
    .wow:first-child {
      visibility: hidden;
    }
  </style>

</head>
<body>

 <!-- Start Header  -->
 <header>
        <div class="container">
               <div class="logo">
                        <a href="">Fitness <span>FIT+ TRACKER</span></a>
               </div>
               <a href="javascript:void(0)" class="ham-burger">
              <span></span>
              <span></span>
               </a>
               <div class="nav">
                        <ul>
                                <li><a href="#home">Home</a></li>
                                <li><a href="#about">About</a></li>
                                <li><a href="#service">Services</a></li>
                                <li><a href="#classes">Classes</a></li>
                                <li><a href="#schedule">Schedule</a></li>
                                <li><a href="#price">Price</a></li>
                                <li><a href="#contact">Contact</a></li>
                        </ul>
               </div>
        </div>
 </header>
 <!-- End Header  -->

  <!-- Start Home -->
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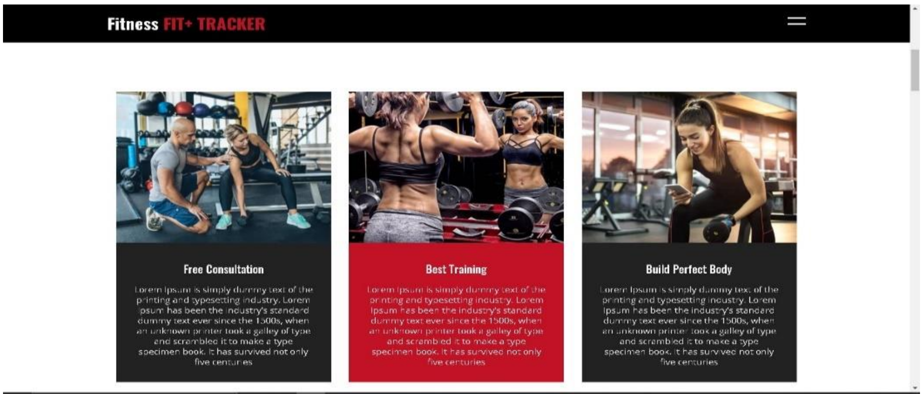

PERFORMANCE EVALUATION OF A REAL-TIME BASED WEB APPLICATION: A CHAT APP CZAT

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ABSTRACT
This article discusses a number of useful tools and techniques that are used in this real-time chat software for the development. We will also discuss how the procedure is performed by a live chat software, primarily focused on the JavaScript library REACT JS. Then, my friend, and I have a comparison of instant messaging program, via our live-chat-app. This article is about the technology that is being used in the development of the JavaScript library, React-JS, APIS, CSS, HOOKS, and props, and explains the functionality of the software. It is hoped that this will provide a useful framework to guide the process.

Keywords—ReactJS, React Hooks, Props, CSS, APIs, AI

I. INTRODUCTION

The intelligence shown by machines is called AI. AI has become popular in the today's world. It is designed to simulate the natural intelligence of a machine that is programmed to pick up and mimic the actions of human beings. These are the machines that can learn, rehearse, and perform human-like tasks. As technologies like AI are developed, they will have a significant impact on the quality of our lives. Of course, today is all you have to do is to connect with AI technology, whether as an end user, or for a career in the field of artificial intelligence.

The word "CZAT" is derived from the Polish language, it means "conversation". The idea behind the creation of this video chat app is the approximation of the organization that has various departments and locations. In this way, they can be a great bird house. It will also be made to protect the user's safety, but it also includes a variety of styles, that are going to be in the United States-the very friendly and helpful.

The chat application will have to support the user, just like all other chats, but the difference on this chat application is that you can send certain message and we can create as many communities as we want to. There is also true even if the user is active or not. This live chat app, also provides a variety of solutions for a variety of users, in order to protect the privacy and the environment, including the users. It also includes images of a user's gallery, so you'll be able to view all of your published photos without having to go back to your chats.

II. RELATED WORK

A. React Hooks

The dashboard is a feature that lets you know the situations, the reactions, and the life of the functions of the functional components. Hooks are not supported by class components; they are design to work with functional components only. To respond is to provide several built-in hooks like use state. You can also create your own dashboards to use to track the behavior and state from one component to another. First, we take a look at the interior of panel.

B. APIs

API is the acronym for Application Programming Interface, which is a software intermediary that allows two applications to talk to each other. Each time you use an app like Facebook, send an instant message or check the weather on your phone, you're using an API. When you use an application on your mobile phone, the application connects to the Internet and sends data to a server. The server then retrieves that data, interprets it, performs the necessary actions, and sends it back to your phone. The application then interprets that data and presents you with the information you wanted in a readable way. This is what an API is - all of happens via API.

C. ReactJS

React is an open-source front-end Java Script library for creating a custom user interface or user interface components. It is supported by facebook, and your own development, and the business community. React can be used as a foundation to build one-page or mobile applications.

D. React Props

In some cases, these components need to communicate (send information to each other, and a way to transfer the data between the ingredients of the use of the props.

"The props"is a special word in React, which specifies the characteristics of, and are used to transfer data from one device to another.

However, the important point here is that the information given out by the bank, are the details of the one-way flow.

III. LITERATURE SURVEY

Technology trends in both hardware and software have driven the hardware industry towards smaller, faster and more capable mobile hand-held devices that can support a wider-range of functionality and open source operating systems. Mobile hand-held devices are popularly called smart gadgets [4]. Adding text messaging functionality to mobile devices began to gain attraction in the mobile communication services community in the early 1980s. The first action plan of the Group GSM was approved in December 1982, requesting "The services and facilities offered in the public switched telephone networks and public data networks should be available in the mobile system". This plan included the exchange of text messages either directly between mobile stations, or transmitted via Message Handling Systems widely in use at that time. The first proposal which initiated the development of exchanging informationor sent message to the user was made by a contribution of Germany and France into the GSM group meeting in February 1985 in Oslo. Initial growth was slow, with customers in 1995 sending on average only 0.4 messages per GSM customer per month. In 2013, 6.1 trillion text messages were sent [2]. This translates into 193000 SMS per second. While SMS reached its popularity as a personto-person messaging, another type of SMS is growing fast: application-to-person (A2P) messaging. A2P is a type of SMS sent from a subscriber to an application or sent from an application to a subscriber. It is commonly used by financial institutions, airlines, hotel booking sites, social networks, and other organizations sending SMS from their systems to their customers. According to research in 2013, A2P traffic is growing faster than P2P messaging traffic. Over the years several approaches and solutions presented considering the secure exchanging of message thorough client and webserver. The various researches have been done and are going on location based project and in the same ratio various applications have been developed on location-based and message sharing system. As the amount of user deal to exchange the information with other people to store the large amount of data, but existing system cannot support the centralized database. Sensitive data may also be leaked accidentally due to improper disposal or resale of storage media. Diesburg et al. survey, summarizes and compares existing methods of providing confidential storage of data but it cannot support the secured communication between the user application and the webserver. Ramesh Shrestha, Yao Aihong et al. developed location and message sharing system for Android Platform. In the present location based services, the works are mainly focused on how to handle the location, how to

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display Google map on android devices and finally about classes and functions used for location services [7]. “The recent convergence of communication and information technologies has created possibilities unthinkable only a few years ago” Venkatesh (1998). Mobile phones, email, SMS (Short Message Service) and Instant Messenger are new communication technologies, which all contribute to the “death of distance” Cairncross (2001). Instant Messenger is a proprietary, simplified version of Internet Relay Chat, which allows two or more people to carry on a conversation, in realtime, using text based messages in context to awareness. Instant Messenger is used, to avoid boredom, to socialize, Lai et. al. (2002), and to maintain contact with casual acquaintances, Lee et. al. (2002). Leung (2001) found seven motives for messenger use among college students: affection, inclusion, sociability, entertainment, relaxation, escape and fashion. Mathieson (1991) found people use these mediums to sustain a sense of connection [9].

A lot of portals are available which provide messengers free of charge. Since they are free of charge, they are the preferred services by millions of people around the world. Some of the Mobile Messaging Applications which are generally used are:

i. Hike ii. Chat On iii. WhatsApp

iv. E-buddy messenger v. Facebook Messenger

vi. G Talk

vii. Go SMS Pro viii. We-chat

IV. PROJECT OBJECTIVE

This is a project that aims to create an on-line chat system for the ability to communicate in real-time with the help of a web browser. In order to achieve this, it is a real time strategy, that WebRTC is to follow. On WebRTC, the method does not require an extra web browser connected to the condition, your browser supports WebRTC, similar to the strategy of the The Google Chrome Browser. However, you will need to install the plug-in, which is a common practice of the monitors of the WebRTC platform.

1. **To submit an on-line consultation is the solution:** It's the traditional way to get advice, meet some problem, because of the availability of the students and the teachers in the school.

2. **In order to make a more robust system for the constraint:** To measure the efficiencyof the system, the appointment system will help you to deal with the appointment more effectively. This is the mission of the system, which means you will get a template to fill in and submit the assignment.

3. **To send a TEXT-message reminder to remind the speaker of tips on how to:** In a TEXT-message reminder tobe sent in both directions, the teacher uses ideas, and culture in the republic of Azerbaijan, to the students in order to remind them that they are in a way. This is to ensure that both parties do not miss appointments in the past.

4. **Proposed approach:**

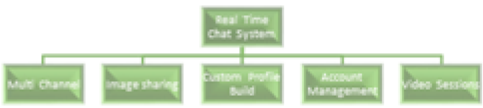

Figure 1

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V. SCOPE

This project is going to be the subject of a web-mode. Aspart of this project, it is planned to use an on-line solution through a webchat system for both students and teachers. The project also includes a system so as to efficiently manage all of the meetings between the students and the teachers. In addition, a real-time communication system is a part of the project, whose function is to create a face-to-face communication between students and teachers. Other additional features include the value of these projects, as screen sharing, what's going on, display the current user, file-sharing and text chat etc.

VI. FEASIBILITY ANALYSIS

The analysis is -

- Many communities and users can access the web-app on the same time.
- The CZAT web-app is free of cost
- The user can access their chats from anywhere.
- The web-app is responsive and can fit to any device'sbrowser
- This is a Real-time chat app.

IX. PROPOSED WORK DIAGRAM

VII. REQUIRED TOOLS

In this section the required tools are as follows: -

- **React.js : frontend**

The React js is used for making the UI of the chat app which gives the user a better user experience, and it is highly scalable.

A. Login Page:

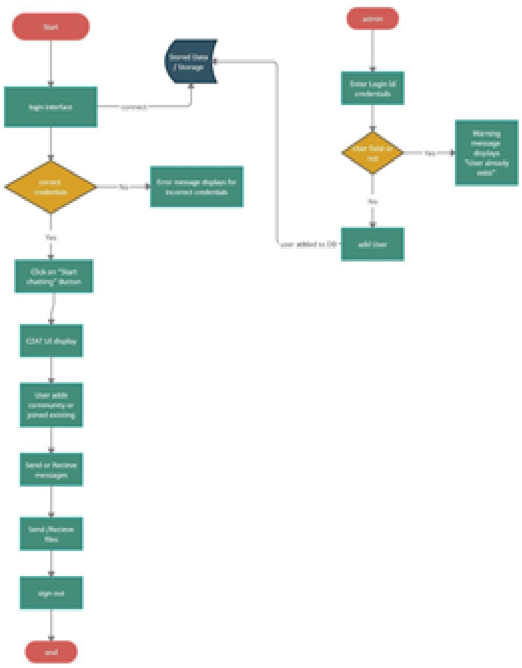

Figure 2

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X. RESULTS

- **Chat Engine rest API : backend:** The chat Engine handles all the backend and it provides the connection between the user to chat with the help of socket.io
- **Npm – used to run reactjs:** Npm script is packet manager for JavaScript. We use this to run the whole app into the browser to port 3000.
- **Visual Studio code – code editor:** VS code is the code editor where all the code is written and implement to the browser
- **Sockets – for two way interactive communication between user's and a server:** Socket.io is used to make the real-time communication between user .Its is the real-time JavaScript library

VIII. FEATURES

- Many users can access the real time chat web-app on the same time.
- The chat app also consists of login page, sign up page.
- User can also build his profile.
- User can create the community to chat with its likeminded people.
- The users can also react on the posts
- The user can also share images to other users.

In the image, we can provide information such as User Name and password. User can successfully login to chat application for further use.

Figure 3

B. Profile Page

We have added page to add full details of User as their personal.

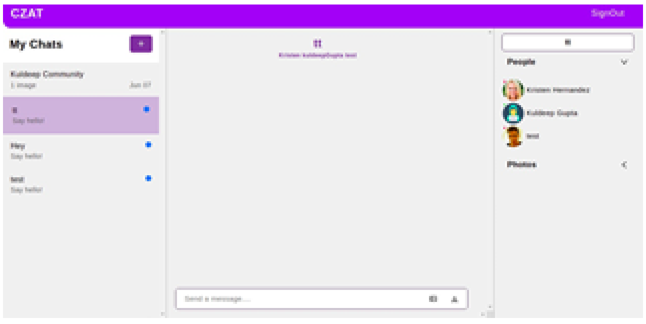

Figure 4

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C. Community section

Here you can see all your communities you have added too.

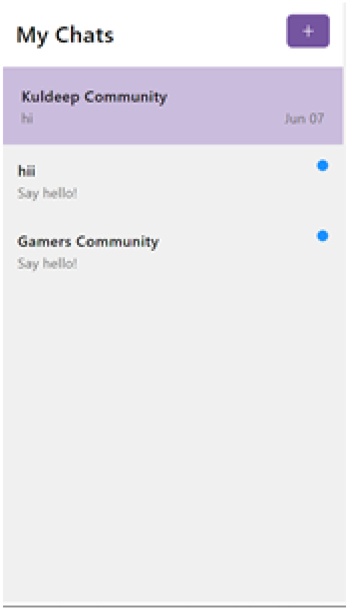

Figure 5

D. Chat Area

Here all your chats and media can be seen and message canbe send from here.

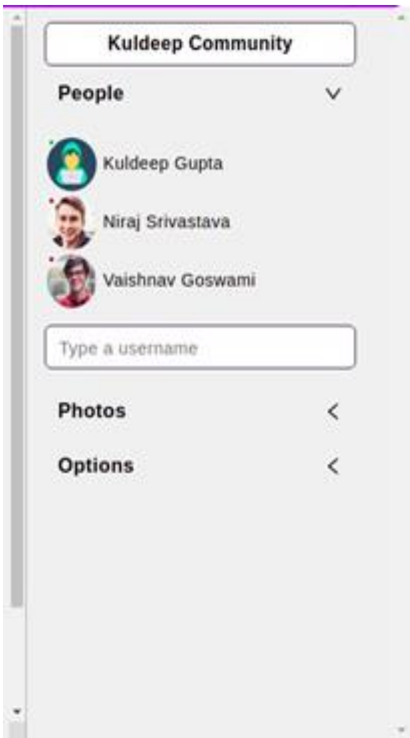

Figure 7

XI. BENEFITS FOR REAL TIMESOCIETY

The chat app provides the real time facility through which user can see the latest message as soon as the other user sends the message, that means, after every message user doesn't need to refresh the screen to read the new messages. New message will get loaded dynamically through real time chat app database.

XII. CONCLUSION

The Instant Messenger is a simplified version of Internet relay chat, which allows to use two or more people in order to have a real-time conversation via text message with a contextual awareness of the issue.

E. Chat Settings

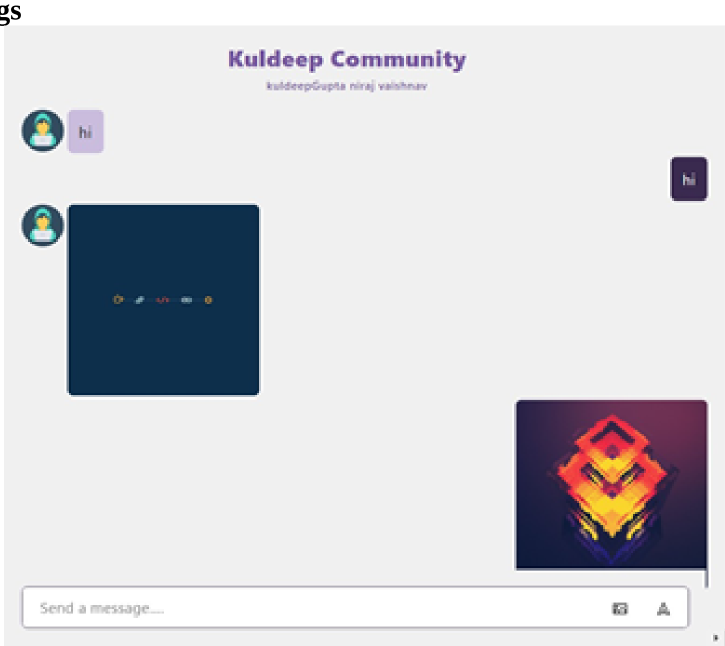

Figure 6

There are so many people, who ensure, that themessages are free of charge. Free of charge is preffered service for the millions and millions of people all around the world. Some of the mobile apps, messages are typically used for Hiking, walking, Chatting In WhatsApp, E-pal, messenger, Facebook, etc

CZAT) is a type of real-time chat software, and here you can see which community you are in and how many people are there in that community and how many of them are online or offline and you can see whatever media is shared and also, extra features to the existing mobile messagingapplications.

Chatting is very frequent among the users. It is a great way to communicate with other users around the world. In our project, we have provided a chat room feature which connects a group of people to communicate with each other. Sharing media, creating communities, real-time conversation, and admin access are some of the considerable features of our chat app.

Sending messages in our chat app does not require any fee, that is, it is free of cost. We have used third-party API in our chat app to communicate with the chat engines which takes care of the database and helps to communicate with people. Thus, our chat app scalable, reliable and efficient to use.

XIII. REFERENCES

- End-to-End Secure and Privacy Preserving Mobile Chat Application https://link.springer.com/chapter/10.1007/978-3-662-43826-8_9
- Professional chat application based on natural language processing https://www.researchgate.net/publication/325560454_Professional_chat_application_based_on_natural_lan guage_processing
- Developing an End-to-End Secure Chat Application https://www.researchgate.net/publication/322509087_Developing_an_End-to-End_Secure_Chat_Applicatio n
- Karen Church, What’s up with WhatsApp? Comparing Mobile Instant Messaging Behaviors with Traditional SMS, AUGUST 30th, 2013 – MUNICH, GERMANY.
- Sushant A. Patinge, Pravin D. Soni, A Survey on Instant Message and Location Sharing System for Android, International Journal of Application or Innovation in Engineering & Management (IJAIEM), Volume 2, Issue 10, October 2013.
- Margaret Butler, “Android: Changing the Mobile Landscape”, 2011 PERVASIVE Computing, Available: www.computer.org/pervasive, [Online; accessed 24-Sep-2013].
- Zhaohui Wang, Rahul Murmuria, Angelos Stavrou, “Implementing and Optimizing an Encryption Filesystem on Android”, 2012 13th IEEE International Conference on Mobile Data Managament, pp. 52-62. [5] Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1989), “User acceptance of computer technology: acomparison of two theoretical models”, Management Science, Vol. 35 No. 8, p. 982-1003.
- Skog, B. (2002), “Mobiles and the Norwegian teen: identity, gender and class”. In Katz J.E. and Aakhus, M. (eds.), Perpetual contact, Cambridge University Press, New York.
- Ramesh Shrestha, Yao Aihong, “Design of Secure Location and Message Sharing System for Android Platform”,2012 IEEE International Conference on Computer Science and Automation Engineering, pp. 117-121.
- Jashandeep Singh, Mobile messaging through android phones: an empirical study to unveil the reasons behind the most preferred mobile messaging application used by college going students, 25 April 2014, Vol.2 (March/April 2014 issue).
- Lee, W.J., Kim, T.U. and Chung, J.-Y. (2002), “User acceptance of the mobile internet”, working paper, IT Management Research Center, Graduate School of Business, Sungkyunkwan University, Seoul.
- MDN Web Docs - https://developer.mozilla.org/en-US/
- React Hooks - https://reactjs.org/docs/hooks-overview.html
- ReactJS - https://reactjs.org/docs/getting-started.html
- React Props - https://reactjs.org/docs/components-and-props.html
- GitHub - https://github.com/
- Sockets- https://socket.io/docs/v3/index.html
- Chatengine.io - https://chatengine.io/docs
- Chatengione Chat Settings - https://chatengine.io/docs/chat_list
- Components - https://chatengine.io/docs/components

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HYDROPHILIC FLORA OF LOCAL WATER BODIES OF THE SAMARKAND REGION AND WAYS OF ITS FORMATION

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ABSTRACT
The ever-increasing demand for natural resources in the world, in particular for the flora, is the main factor in the reduction of biodiversity and its disappearance. One of the main indicators of aquatic organisms in water bodies is the species composition of higher plants and its condition. There is a need to determine the level of anthropogenic influence on plants in the composition of hydrophilic flora and to develop measures to combat it. On a global scale, special attention is paid to scientific research on the study of the natural flora of water bodies of certain territories, the assessment of influencing factors on the formation of flora and monitoring. Especially, in water bodies of densely populated areas, the composition of the hydrophilic flora decreases and its sharp change is associated with the simultaneous influence of natural and anthropogenic factors. On the territory of the Samarkand region, located in the middle reaches of the Zarafshan river basin, there are complex natural and artificial water systems, which are especially distinguished by the diversity of hydrophilic flora. In recent years, as a result of a sharp increase in anthropogenic influence on this territory, it becomes necessary to compile a modern list of the hydrophilic flora of water bodies of the Samarkand region, take an inventory, analyze the formation of flora in various types of water bodies and protect species of natural populations with a shrinking range [1, 2, 3]. In this regard, an inventory of the flora of higher aquatic plants in various types of water bodies of the Samarkand region, determination of the distribution area of rare, useful species in them and the development of protection measures is of great scientific and practical importance.

Keywords: hydrophilic plants, reservoirs of different types, formations, taxonomy, hydrophyte, helophyte, hygrophyte.

1. INTRODUCTION.

The hydrophilic flora of different types of water bodies of the Samarkand region was formed in its own way, based on the characteristics of each water body. At the same time, the region in which the reservoirs are located, the physicochemical and ground properties of water, the peculiarities of the flow of reservoirs and their occurrence are of particular importance. The hydrophilic flora of different types of water bodies in such local areas as the Samarkand region was studied by T. Taubaeva [4], N.V. Shadrina [5], A.P. Laktionov [6], Kh.K. Matjonov *et al.* [7], which took into account the above-mentioned characteristics of water bodies.

1.1. Significance of the Study. The study of the hydrophilic flora of the local territories of the Samarkand region is of great scientific and practical importance. The vegetation of each local flora was formed in its own way. In the composition of each local flora, there are different types of plants that are used in different spheres of human activities.

2. **Materials and Methods.** During scientific expeditions (2016-2020), during research, more than 350 samples of herbariums of higher aquatic and coastal plants were collected from various types of reservoirs of the Samarkand region, which are stored in the herbarium of the Samarkand State University. On the planned route, permanent expeditions of the reservoirs of the Samarkand region were carried out according to the seasons of the year (Fig. 1). The collection of herbaria and monitoring from various types of water bodies were carried out according to the method of Katanskaya V.M. (1981) and classification of reservoirs according to Lisitsina L.I. and Papchenkov V.G. (2020). While defining taxonomic units, the publications “Flora of the USSR” [8], “Flora of Uzbekistan” [9], “Keys to Plants of Central Asia” [10] were used. The current flowering plant system is based on APG IV [11]. Scientific names of genera and species are given according to the "Keys to Plants of Central Asia" and international indices - International Plants Names Index [12], The Plant List [13].

3. **Results and discussion.** The hydrophilic flora of water bodies of the Samarkand region includes 72 plant species belonging to 4 divisions, 6 classes, 34 families and 51 genera (Table 1). According to this data, the main part of the hydrophilic flora is the department Magnoliophyta, in which the number of species of monocotyledonous plants occupies a dominant position, followed by dicotyledonous plants. In the flora, the divisions Polipodiophyta and Equisetophyta each have 1 taxon, which is 1.39% of the total number of plants. In the department Bryophyta, 7 species have been identified, which is 9.72% of the total amount of hydrophilic flora.

Table 1 The composition of the hydrophilic flora of the Samarkand region

№	Taxonomic groups	Class	Family	Genus	Species	%
1	Bryophyta	2	5	7	7	9,72
2	Equisetophyta	1	1	1	1	1,39
3	Polipodiophyta	1	1	1	1	1,39
4	**Magnoliophyta including:**	2	27	42	63	87,5
Liliopsida			13	23	36	50,0
Magnoliopsida			14	19	27	37,5
Total:		6	34	51	72	100

The reservoirs of the Samarkand region were studied and analyzed taking into account the region in which they are located, the characteristics of the reservoir, dividing them into groups such as rivers, canals and ditches; reservoirs, fish ponds; mountain streams and springs; temporary accumulation ponds, rice fields and fertile swamp soils. Floristic analysis of the identified groups of water bodies shows that they differ significantly from each other in floristic composition, and their flora was formed independently of each other.

The relative richness of the hydrophilic flora of rivers, canals and drainage ditches has been revealed. This is due to the fact that the water in them is almost constant, the content of mineral and organic substances is sufficient, as well as the lack of mechanical purification contributed to the formation of various flora and became a habitat for rare species. In the canals flowing through the territory of Karasuv, Siyob, Chashma, Bulungur, Karasuv (Payaryk district), Mirzarik, the mosses *Riccia fluitans* L., *Ricciocarpus natans* (L) Corda., *Fissidens grandifrons* (Brid.) Limpr., Hydrophytes *Potamogeton pectinatus* L., *P. crispus* L., *P. perfoliatus* L., *P. natans* L., *Zannichellia palustris* L., *Myriophyllum spicatum* L., helophytes *Acorus calamus* L., *Butomus umbellatus* L., *Nasturtium officinale* W.T. Aitson., *Sium sisarum* L., *Veronica* *anagallis-aquatica* L., *Rorippa palustris* (L.) Besser., *Bolboschoenus martimus* (L.) Palla., Hygrophytes: *Equisetum arvense* L., *Triglochin palustris* L., *Artraxon langsdorffi* Hochst., *Polypogon demissus* Steud., *Cynodon dactylon* Pers., *Poa trivialis* L., *Glyceria plicata* Fries. *Cyperus flavidus* Retz., *C. sanguinolentus* Vahl., *C. serotinus* Rottb., *C. difformis* L., *C. longus* L., *Ranunculus pachycaulon* (Nevski) Luferov., *V. anagalloidis* Guss., *Mentha longifoilia* (L.) L., *Stachys setifera* C.A.Mey., *Sagittaria trifolia* L.

Drainage ditches are also home to many aquatic plants. Drainage ditches differ from canals and ditches in that some species are very widespread in them in relation to others. In the Taylyak, Samarkand and Pastdargom districts, the medicinal plant *Nasturtium officinale* W.T. Aitson. is widespread in drainage ditches, which completely covers the water surface. It was revealed that *Typha laxmannii* Lepech., *T. angustata* Bory & Chaub are abundant in the drainage ditches of the Ishtykhan, Dzhambay, Payaryk and Kattakurgan regions in relation to other species and *Phragmites australis* (Cav) Trin.

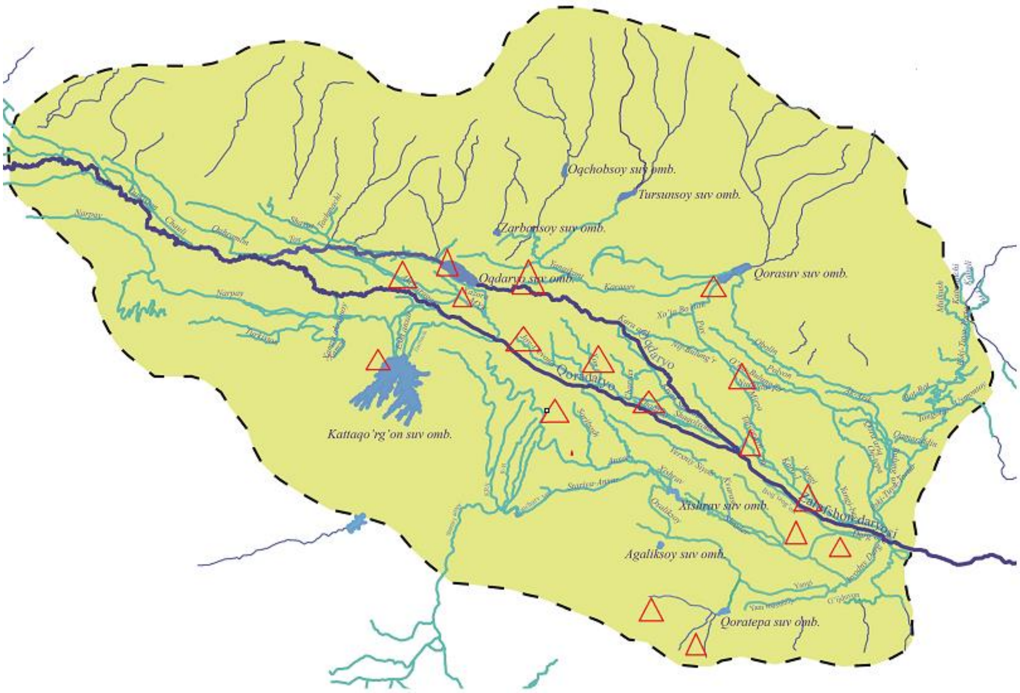

Fig. 1. Schematic map of reservoirs of Samarkand region

The main reason for the rapid spread of some species is the discharge of wastewater, the systematic mechanical purification of water, as well as the collection by humans of the above ground part of plants as animal feed and as building material, which leads to the rapid spread of species propagated by rhizomes and root suckers. The Kattakurgan, Akdarya and Karasuv reservoirs are characterized by a small number of species and their number. These reservoirs are adapted for the accumulation of excess water from rivers as a result of seasonal mudflows, so their water surface is not constant. In these reservoirs, the hydrophytes of *Zannichellia palustris* L., *Nayas marina* L., *Ceratophyllum demersum* L., *Potamogeton perfoliatus* L., *Myriophyllum spicatum* L are widespread; helophytes - *Phragmites australis* (Cav) Trin., *T. laxmannii* Lepech., *T. angustata* Bory & Chaub., *Cynodon dactylon* Pers., *Glyceria plicata* Fries., *Poa trivialis* L. *Nayas marina* L., *Ceratophyllum demersum* L., *Potamogeton perfoliatus* L., *Myriophyllum spicatum* L.

Fish ponds are mainly filled from rivers, streams, ditches and canals, as well as from groundwater. In this regard, *Typha laxmannii* Lepech., *Sparganium microcarpum* Celak., *Potamogeton pectinatus* L., *Nayas marina* L., *Triglochin palustris* L., *Sagittaria trifolia* L., *Alisma lanceolatum* L., *Cynodon dactylon* Pers., *Glyceria plicata* Fries., *Schoenoplectus lacustris* (L.) Palla., *Bolboschoenus martimus* (L.) Palla., *Ceratophyllum demersum* L. - chemical composition and soil and climatic conditions, so it differs from the flora of plain reservoirs. *Heracleum lehmannianum* Bunge, *Orchis umbrosa* Kar. et Kir., *Datisca cannabina* L. are characteristic plants for mountain streams and springs.

In rice fields, in places where temporary irrigation is carried out, in lowlands after heavy rains and floods, water accumulates. Therefore, there is no permanent flora in these places. In rice fields, there is a sufficient amount of nutrients, the speed of water flow is low, therefore, the rapid growth and development of individual aquatic plants is ensured. Among these plants, *Echinochloa crus-galli* (L.) P. Beauv., *E. oryziocola* Vasing., *Cynodon dactylon* Pers. are the most virulent weeds.

In addition to these plants, such plants as *Schoenoplectus lacustris* (L.) Palla., *Bolboschoenus martimus* (L.) Palla., *Rumex syriacus* Meisn., *R. conglomeratus* Murray., *Plantago major* L., *Typha angustata* Bory & Chaub., *T. laxmannii* Lepech., *T. minima* Funck., *Azolla caroliniana* Willd., *Sparganium microcarpum* Celak., *Lemna trisulca* L., *L. minor* L. water from trough irrigation ditches, in some places when water comes out of irrigation ditches along the canals, large and small temporary reservoirs are formed.

As a result of excessive accumulation of moisture in the soil, a characteristic hydrophilic flora is formed in these places. Here, representatives of the hydrophilic flora are widespread: *Typha* L., *Persicaria* Mill., *Rumex* L., *Ranunculus* L., *Plantago* L. species, *Echinochloa crus-galli* (L.) P. Beauv., *Polypogon demissus* Steud., *Cynodon dactylon* Pers., *Cyperus longus* L., *Rumex syriacus* Meisn., *Rorippa silvestris* (L.) Besser., *Bidens tripartite* L., *Veronica anagalloidis* Guss., *Mentha longifoilia* (L.) L. that the water here is not constant.

In terms of the quantitative composition of the species of hydrophilic flora, common in the water bodies of the studied territory, the flora of the canals occupies a leading position, 31 species (43.05%) of plants are widespread here. The next places are occupied by drainage ditches of 25 types (34.72%), temporary reservoirs and moist soils of 22 types (30.55%), mountain rivers and springs of 21 types, (29.16%), fish ponds of 18 types, (25, 00%), rice fields of 12 types (16.66%), river banks of 10 types (13.88%) and reservoirs of 9 types (12.5%). Of the specific species, 10 (13.88%) are found in all types of water bodies as active species. These include *Typha angustata* Bory & Chaub., *Phragmites australis* (Cav) Trin., *Cyperus longus* L., *Schoenoplectus lacustris* (L.) Palla., *Cratoneuron filicinum* (Hedw.) Spruce., *Equisetum arvense* L.

Due to the fact that the territory of the Samarkand region belongs to dry climatic zones, sometimes there is a drying up of individual water bodies, as well as the formation of territorial hydrophilic flora, mainly due to adventive species, active species make up a small part of the total number of hydrophilic species. This is evidenced by the distribution of flora species in groups in relation to water.

A disproportionate formation of the ratio of the main taxa of the hydrophilic flora is observed. Flowering plants, which make up the bulk of the hydrophilic flora, include 24 families (70.59% of the total number of families), 42 genera (82.35% of the total number of genera), 63 species (87.5% of the total number of species). The main taxa of monocotyledonous plants occupy a clear leading position among the hydrophilic flora. One can see the mutual equality of the main taxonomic units Equisetophyta and Polipodiophyta.

In the hydrophilic flora of the leading families in terms of the number of species - 9, they include 42 species (58.33%). These leading families include 23 genera (45.09%). The rest of the families have 1-2 species and they make up 41.67%). Representatives of the monocotyledonous family (Poaceae, Cyperaceae) occupy a leading position in the studied area. These accounted for 16 species (22.22%). The next places are occupied by the next 7 leading families, which make up 36.11%. The remaining 3 families include (each with 2 species 2.77%) and 22 families with 1 species (each 1.38%).

Table 2 Taxonomic spectrum of hydrophilic flora in water bodies

Indicators	Water bodies			
	Rivers, canals, drainage ditches	**Reservoirs, fish ponds**	**Mountain reservoirs**	**Temporary reservoirs other**
Number of species	57/79,16%*	19/26,38%*	10/13,88%*	21/29,16%*
Number of genera	35/68,62%**	17/33,33%**	10/19,60%**	19/37,25**
Number of families	25/73,53***	17/50,00%***	9/26,47%***	17/50,00***
Average number of species per genus	1,62	1,11	1,0	1,10
Average number of species in a family	2,28	1,11	1,11	1,23
Average number of genera per family	1,40	1,0	1,11	1,11

*Note: * in% of the total number of species, ** in% of the total number of genera, *** in% of the total number of families*

4. CONCLUSION

As a result of the analysis of the ratio of taxa of hydrophilic flora in rivers, canals and drainage ditches in the study area, 57 species (79.16%) were identified belonging to 35 genera, 25 families, 19 species were found in reservoirs, fish-breeding ponds (26.38%) belonging to 17 genera, 17 families, in mountain rivers and around springs 10 species (13.88%), belonging to 10 genera, 9 families, in rice fields, temporary reservoirs, as well as highly moistened soils 21 species (29.65 %), belonging to 19 genera and 17 families. In water bodies, a difference was also observed in the mutual ratio of taxa (Table 2). Current water bodies such as rivers, canals, irrigation ditches and drainage ditches in the study area are characterized by a high occurrence of species, occupying relatively large territories and enriched by the addition of adventive species due to their direct connection with other territories.

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REFERENCES:

1. Tashpulatov Y.Sh., Khamdamov I.Kh., Nurniyozov A.A. “Water and Coastal Water Vegetation of Various Types of Waters in the Samarkand Region”, EurAsian Journal of BioSciences. № 13, pp.1413-1417. 2019.

2. Nurniyozov A.A., Tashpulatov Y.Sh. "Flora and its Analysis. Hydrophilic Plants of Different Types of Water Bodies of the Samarkand Region (Uzbekistan)", Bulletin of Science and Practice. T. 6. No. 9. pp. 20-34. 2020. https://doi.org/10.33619/2414-2948/59.
3. Tashpulatov Y.Sh. Nurniyozov A.A., Ulashev D.S. "Useful Wetland Plants of the Samarkand Region (Uzbekistan)", Bulletin of Modern Research. No. 2-7 (29), pp. 75-77. 2019.
4. Taubaev T. "Flora and Vegetation of water bodies of Central Asia". 490 p. -132 p. 1970.
5. Shadrina N.V. "Comparative Analysis of Aquatic Cenofloras of the West Kazakhstan steppe province", Hydrobotany: Methodology, Methods: Materials of the School on Hydrobotany. pp.184-186. 2003.
6. Laktionov A.P., Meshcheryakova N.O., Pilipenko V.N. "Flora of reservoirs and Water Courses of the Astrakhan Region". 314 p. 2014.
7. Matjonova Kh.K., Orel M.M., Matzhanov T.K. "Higher Aquatic Plants of Water Bodies of the Detovoy Zone of the Amu Darya River are the Food Resource of Herbivorous Fish", Bulletin Karakalpak branch Academy of Sciences of the Republic of Uzbekistan. pp. 47-51. 2018.
8. Katanskaya V.M. "Higher Aquatic Vegetation of the Continental Reservoirs of the USSR". - L. 198 p. 1981.
9. Lisitsyna L.I., Papchenkov V.G. "Flora of Reservoirs Russia". 236 p. 2020.
10. "Flora of the USSR". In 30 and so - M.-L.: AN SSSR. 1934-1960.
11. "Flora of Uzbekistan". In 6 volumes. Academy of Sciences of the UzSSR. 1941-1962.
12. "Keys to plants of Central Asia". I-X volumes. 1965-1993.
13. Shcherbakov A.V. "Classifications of Life Forms and Analysis of Information on Regional Floras of Water Bodies", Byul.MOIP. Dept. Biol. pp. 16-24. 1994.
14. Shcherbakov A.V., Mayorov S.R. "Aquatic adventive plants of the Moscow region". Bulletin of the Udmurt University. Biology. earth sciences. Issue 2. pp. 57-61. 2013.
15. Angiosperm Phylogeny Group. "An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG IV", Botanical Journal of the Linnean Society – London: Kew Garden Press. – T. 181, –pp. 1-20. 2016.
16. International Plant Names Index [Electronic resource]. –http://www.ipni.org
17. The Plant List [Electronic resource]. – http://www.theplantlist.org

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THE USE OF HIERARCHICAL CLUSTER ANALYSIS AND LOGARITHMIC HIERARCHICAL MODEL TO SHOW THE DISTRIBUTION OF GRADUATE STUDENTS TO IRAQI UNIVERSITIES

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ABSTRACT

Mass analysis belongs to multivariate analysis and is used to classify variables into homogeneous groups according to similarities and differences in case characteristics or other variables. It is based on two types of hierarchical and non-hierarchical analysis. We were interested in this research applying the hierarchical analysis to show the distribution of graduate students to Iraqi universities. Hierarchical logarithm analysis was applied to show interaction between variables. Universities are classified into four groups, depending on the number of students admitted to graduate studies according to the type of study and gender. Among the three studies at the same university, there are statistically significant differences between the numbers of students admitted to the same university. Logarithmic analysis showed that the percentages for the presence of the three studies (HB, MA, PHD) were (84%), which were approximately equal in most universities. The study also concluded that there must be equal educational opportunities available between universities and the work of all majors required for colleges.

key words: hierarchical cluster, logarithmic hierarchical, Saturated models, logarithmic linear model, Cluster Analysis.

1. INTRODUCTION:

Higher education means the education provided by universities, colleges and other institutions that grant academic degrees. Higher education includes both undergraduate and postgraduate levels. University and graduate studies are the basis for preparing researchers and are the source ofscientific research, which is the basis for the development of science and knowledge. Universities also work to enrich society with quantity, type, and specializations in all fields. It is considered the basis for achieving development in various fields and for developing appropriate solutions to most of the problems faced by societies. Therefore, graduate studies are considered a source of economic, social, developmental and intellectual strength for the country. The expansion of universities and their acceptance of number of graduate students must be studied and controlled so as to fit the country's requirements in the required disciplines spatially and temporally.

The importance of higher education is that it provides graduates with more jobs and fields of choice among these jobs. It also improves an individual's quality of life, as well as access to better health care, better nutritional and health practices, greater economic stability and security, more job opportunities, greater job satisfaction, less dependence on government assistance,greater community service and leadership and more self-confidence.

Higher education will, in theory, enable individuals to expand their knowledge and skills, express their ideas clearly in speech and writing, understand abstract concepts and theories, and increase their understanding of the world and society. It also increases their job opportunities by establishing small and large projects according to their specializations, which in turn develop and revive the country's economy and raise the government's burden of job spending.

1. Problem of study

The researcher believes that there is no balance in the number of students accepted for postgraduate studies between different universities, which leads to an abundance of graduate degree holders in certain governorates and a lack of their numbers in other governorates, which leads to problems in employing them and benefiting from them, and also leads to the reluctance of students to apply in their universities Close to their places of residence and applying to other universities to increase the chance of admission, and this leads to great costs and efforts on the student segment.

2. Aim of the study

. The research aims to achieve a statistical study that divides the data of students accepted in universities into groups, and each group has a great convergence (homogeneity) among them to see if there is a balance and convergence between universities according to the acceptance of students in graduate studies. And clarify the problem to the officials to consider finding appropriate solutions. As well as to determine the suitability of cluster analysis for such data. And the linear logarithmic model in data analysis to study the relationship and effect between variables using the hierarchical filter method

3. Population of study

The study population was represented in the preparation of graduate students (higher diploma, master's, doctorate) by gender for the academic year 2017-2018 and according to what was stated in the report of the Central Statistical Organization for the year 2018. The limits of the research were represented in the Iraqi government universities.

4. Cluster Analysis

It represents one of the classification methods for the purpose of classifying and aggregating data into groups of homogeneous elements within each group and different from other groups. The first use of cluster analysis was in 1939 by the scientist Tryon, and it depends on the (Similarity) and (Dissimilarity) parameters, by calculating the distances between observations and this analysis belongs to (Multivariate Analysis), which is used to classify variables into homogeneous groups according to specific characteristics, but they are different or less similar from other cases or variables found in other clusters. Cluster analysis is represented in arranging cases or variables so that it minimizes the variance within one cluster and maximizes the variance between the different clusters [3].

Some terms must be defined, including:

- The Cluster: It is a group of elements related to each other according to common properties so that the cluster contains the most homogeneous elements within the group and different from the rest of the groups.
- The Object: It means to study the element and is used to represent things.
- The Distance: It is a visualization of the symmetry between the elements.
- The Tree: It is a graphic representation of the different clustering processes on a group of elements according to the degrees of symmetry scale associated with each clustering process. The tree consists of the root, the departing elements, the scar and the height of the tree.

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5. Stages of cluster analysis

The principle of analysis depends on the sequential classification on the summation of the two most close elements in each segmentation and create a tree called Dendrogramme. It is usually obtained when we collect the first two elements that are closest to form the top, leaving n-1 as a target, then the process is repeated until the total assembly It depends on the following stages:

1- Form (Proximities Matrix), which is a square matrix of degree n symmetrical whose elements are measures that express the distance between each pair of data and is symbolized by thesymbol D. It is known as:

$$D = \begin{bmatrix} d_{11} & d_{12} & \cdots & d_{1n} \\ & \vdots & \ddots & \vdots \\ d_{n1} & d_{n2} & \cdots & d_{nn} \end{bmatrix}$$

Euclidean distance

We use the distance between the elements in order to distinguish between them and to measure this distance we use the Euclidean distance method or the square of the Euclidean distance.

The Euclidean distance formula is one of the most famous distance measures K, L Both of them are characterized by $X_{.1}$, $X_{.2}$ and to find the distance between the two elements K, L. we use the

Pythagorean theorem [7] [1]:

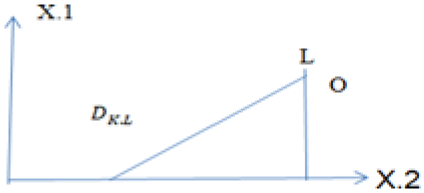

Figure (1) shows the representation of the distance between the two elements K.L

$$D^2_{K,L} = (\overline{OK})^2 + (\overline{OL})^2$$
$$= (X_{K1} - X_{L1})^2 + (X_{K2} - X_{L2})^2$$
$$D_{K,L} = \sqrt{\sum_{j-1}^{2} (X_{Kkj} - X_{Lj})^2}$$
$$D_{K,L} = \sqrt{\sum_{j-1}^{n} (X_{Kkj} - X_{Lj})^2}$$
$$D^2{}_{K,L} = \sum_{j-1}^{n} (X_{Kkj} - X_{Lj})^2$$

1- Hierarchical Cluster Analysis

This type of analysis depends in its mechanism of action on the methods of merging anddivision." Until all the views are in one group", while in the division (Division) "the views are allin one group", then "the group is divided into two groups" and continues "until you put each viewer in one group [6]".

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In the hierarchical analysis, we depend on choosing the distance α_i between two clusters or an element and a cluster, and using the sum of squares of the total deviations from the cluster mean,

The calculation of distances in the hierarchical cluster analysis is based on a set of methods, and measures of similarity. These methods depend on the measure of similarity used between the elements to determine the level of fusion, and this measure is the measure of the distance (Euclidian distance).

6. Hierarchical logarithmic linear model [8],[4]:

This type of model is applied to multi-directional reciprocal tables, i. e. categorical data, and it focuses on the presence or absence of relationships between variables that determine cross tabulation.

Linear logarithmic analysis has become a widely used method in the analysis of multivariate frequency tables, which we obtain from the classified groups, whether multiple nominal variables, or monotonous groups, or variables from the level of discontinuous periods.

We will start by introducing the standard hierarchical logarithmic modeling structure and then focus on more advanced types of linear logarithmic models. The Standard Model For logarithmic (hierarchical) linear models begins by naming each variable with a letter, and establish the effects of the relationships between these variables, and logarithmic (hierarchical) models are of limited importance.

- **Saturated models**

Suppose we have a frequency table consisting of three categorical variables (A, B, C), with indicators (a, b, c), and denotes the number of classifiers A*, B*, C* respectively. let it be m_{abc}It represents the expected frequency of a cell belonging to row a of A, b of B, and c of C. The saturated logarithmic model of a triple table ABC is given by the following formula:

$$logm_{abc} = \lambda + \lambda_a^A + \lambda_b^B + \lambda_c^C + \lambda_{ab}^{AB} + \lambda_{ac}^{AC} + \lambda_{bc}^{BC} + \lambda_{abc}^{ABC}$$

It should be noted that the logarithmic transformation of Mabc is flexible because it restricts the expected frequencies to remain within the permissible range.

The result of selecting a linear model $logm_{abc}$ It is the multiplication form that is obtained with respect to m_{abc}

$$m_{abc} = exp(\lambda + \lambda_a^A + \lambda_b^B + \lambda_c^C + \lambda_{ab}^{AB} + \lambda_{ac}^{AC} + \lambda_{bc}^{BC} + \lambda_{abc}^{ABC})$$

$$= \tau + \tau_a^A . \tau_b^B . \tau_c^C . \tau_{ab}^{AB} . \tau_{ac}^{AC} . \tau_{bc}^{BC} . \tau\lambda_{abc}^{ABC} \qquad \text{……….. (2)}$$

From equations (1) and (2), it can be seen that the saturated model contains all the interaction terms between A, B, and C. In the sense that there are no previous restrictions imposed on the data, and in any case, equations 1, 2 contain the diagnosable parameters, and for the expected frequencies m_{abc}There is no single solution for landmarks(λ). Therefore, certain restrictions have to be imposed on the features, in order to make them diagnosable. One option is to use an ANOVA like constraints:

$$\sum_a \lambda_a^A = \sum_b \lambda_b^B = \sum_c \lambda_c^C = 0$$

$$\sum_a \lambda_{ab}^{AB} = \sum_b \lambda_{ab}^{AB} = \sum_a \lambda_{ac}^{AC} = \sum_c \lambda_{ac}^{AC} = \sum_b \lambda_{bc}^{BC} = \sum_c \lambda_{bc}^{BC} = 0$$

$$\sum_a \lambda_{abc}^{ABC} = \sum_b \lambda_{abc}^{ABC} = \sum_c \lambda_{abc}^{ABC} = 0$$

Paraphrasing is for features in which each set of the sum of the features is zero. Through its numerical indicators, it is called the effect notation, which is the term λ and refers to the general average $logm_{abc}$.

The parameters of a single variable $\lambda_a^A, \lambda_b^B, \lambda_c^C$ It refers to the relative number of cases at different levels of A, B, and C, measured by deviations from the mean, and the interaction limits for the two variables. $\lambda_{ab}^{AB}, \lambda_{bc}^{BC}, \lambda_{ac}^{AC}$ Relative to the strength of the partial coupling (compatibility)

between A, B and b, c and A, C. The partial agreement can be explained as an association between two variables within the levels of the third variable. Finally, the parameters of the triple interaction indicate the amount of difference in the interaction of the two conditional variables from one to the other within the categories of the third variable.

λ_{abc}^{ABC}

- **Non-saturated models**

As mentioned above, in the saturated logarithmic linear model, all the possible interaction limits are present and there are no pre-imposed restrictions on the parameters of the model far from the diagnostic limitations. The linear logarithmic models in which the parameters are restricted in a way are called unsaturated models.

There are many types of constraints, one of which leads us to hierarchical logarithmic models, and these models are in which the parameters are fixed to zero in some way, so that a certain interaction limit is fixed at zero, and all interaction limits of a higher order contain all evidence as subset that must also be fixed at zero. So, if we assume that the partial compatibility

between A and B (λ_{ab}^{AB}) does not exist, the triple interaction of the variables λ_{abc}^{ABC} It must be set to zero. Applying the last constraint to equation (1) leads to the hierarchical linear logarithmic model.

$$logm_{abc} = \lambda + \lambda_a^A + \lambda_b^B + \lambda_c^C + \lambda_{ac}^{AC} + \lambda_{bc}^{BC} \quad \text{........ (3)}$$

Also, the three-variable independence model of the logarithmic hierarchical model is:

$$logm_{abc} = \lambda + \lambda_a^A + \lambda_b^B + \lambda_c^C$$

7. **Hierarchical cluster analysis**: by using the SPSS program. V23 The data was analyzed using hierarchical cluster analysis and we got the following results:

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Table: 2. Proximities Matrix

	1: 1	2: 2	3: 3	4: 4	5: 5	6: 6	7: 7	8: 8	9: 9	10: 10
1: 1	0	6099258	8754209	9389206	10126440	10661646	13272338	8448647	13572660	7051664
2: 2	6099258	0	250541	388994	515818	2492368	1418710	206443	1514744	59260
3: 3	8754209	250541	0	21107	53919	2310957	492317	22892	548273	139161
4: 4	9389206	388994	21107	0	30394	2198216	345932	53721	394212	227404
5: 5	10126440	515818	53919	30394	0	2346986	231370	83583	269732	315524
6: 6	10661646	2492368	2310957	2198216	2346986	0	2514704	2147267	2571622	1921210
7: 7	13272338	1418710	492317	345932	231370	2514704	0	557701	1820	1020768
8: 8	8448647	206443	22892	53721	83583	2147267	557701	0	620015	89291
9: 9	13572660	1514744	548273	394212	269732	2571622	1820	620015	0	1101680
10: 10	7051664	59260	139161	227404	315524	1921210	1020768	89291	1101680	0

The matrix shows the degree of kinship between each pair of universities according to the number of students accepted in them, which will lead us to collect and cluster data according to the method of grouping. We see that the square of the Euclidean distance between the first university (Baghdad) and the second (Al-Mustansiriya) is (6099258) and that the distance between the third university (Technological). The second is (250541) and so on, and on the basis of these distances, the clustering between universities will be done.

Then comes the classification of universities in the form of aggregates according to the variables of the preparation of graduate students, and the following table illustrates this.

Table (2) The stages of university clustering and the Average Linkage (Between Groups)
convergence coefficients between them

Agglomeration Schedule						
Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	22	30	8.062	0	0	2
2	9	22	12.532	0	1	8
3	27	29	13.115	0	0	4
4	18	27	18.846	0	3	6
5	25	26	25.632	0	0	12
6	7	18	28.372	0	4	7
7	7	16	29.735	6	0	8
8	7	9	39.331	7	2	19
9	5	14	49.061	0	0	11
10	13	24	63.945	0	0	12
11	5	20	77.431	9	0	17
12	13	25	79.508	10	5	15
13	21	23	91.313	0	0	17
14	4	19	106.75	0	0	20
15	13	28	128.09	12	0	19
16	2	17	133.3	0	0	22
17	5	21	146.77	11	13	20
18	3	8	151.3	0	0	21
19	7	13	161.93	8	15	25
20	4	5	183.38	14	17	23
21	3	15	223.3	18	0	23
22	2	10	242.72	16	0	24
23	3	4	275.17	21	20	25

24	2	11	297.46	22	0	26
25	3	7	489.84	23	19	27
26	2	12	628.14	24	0	27
27	2	3	934.82	26	25	28
28	2	6	1568.9	27	0	29
29	1	2	3240.9	0	28	0

from the results of Table (3) that the levels of fusion are confined between (8.062) and (3240.9) and that both the Southern Technical University and Sumer University have formed the first clustering in the first stage with the lowest convergence coefficient of (8.062), and this is evidentfrom the small number of accepted students. In the second stage, the second cluster was formed between the University of Sumer and the University of Nineveh with a convergence coefficientof (12,532), and we note the convergence due to the lack of higher studies for higher diplomas and doctorates in these three universities. Thus, the process of clustering continues from the lowest dimension to the largest in an ascending manner, as the largest clustering has arisen between Al-Mustansiriya University and the University of Baghdad with a proximity coefficient of 3240,891. In fact, it is the largest in distance from the first clusters, but it is the closest among them. We see this by preparing students for all studies. We can say that the cluster sequence is homogeneous except for the University of Baghdad in an advanced stage of clustering.

After forming the totals for the universities according to the square of the Euclidean distance, theuniversities are classified according to the clusters, that is, similar universities are placed in clusters in terms of similarity in certain characteristics, as shown in the following table:

Table (3) Classification of universities according to clusters. Cluster Membership

Case	the University	4 Clusters	3 Clusters	2 Clusters	Case	the University	4 Clusters	3 Clusters	2 Clusters
01:01	Baghdad	1	1	1	16:16	Fallujah	3	2	2
02:02	Al-Mustansiriya	2	2	2	17:17	Babylon	2	2	2
03:03	technology	3	2	2	18:18	green denominator	3	2	2
04:04	the two rivers	3	2	2	19:19	Diyala	3	2	2
05:05	Iraqi	3	2	2	20:20	Karbala	3	2	2
06:06	Medical specialties	4	3	2	21:21	Dhi Qar	3	2	2
07:07	Computers and Informatics	3	2	2	22:22	Sumer	3	2	2
08:08	Mosul	3	2	2	23:23	Wasit	3	2	2
09:09	Nineveh	3	2	2	24:24:00	Kirkuk	3	2	2
10:10	Basra	2	2	2	25:25:00	Maysan	3	2	2
11:11	Kufa	2	2	2	26:26:00	Double	3	2	2
12:12	Tikrit	2	2	2	27:27:00	Northern Tech	3	2	2
13:13	Samarra	3	2	2	28:28:00	middle technique	3	2	2
14:14	Qadisiyah	3	2	2	29:29:00	Euphrates	3	2	2
15:15	Anbar	3	2	2	30:30:00	Southern Tech	3	2	2

It is noted from Table (3) that the University of Baghdad represents the first university when

categorized into four groups, as well as the first when categorized into three groups and into two groups. While we see medical specialties fall within the fourth group in the case of classification into four groups and within the third group in the case of classification into three groups and the second in the case of classification into two groups and so, for the rest of the universities.

Table (4) Classification of clusters by distance

Cluster Membership				Cluster Membership			
Case Number	the University	Cluster	Distance	Case Number	the University	Cluster	Distance
1	Baghdad	1	0	16	Fallujah	4	229.234
2	Al-Mustansiriya	2	176.705	17	Babylon	2	199.97
3	technology	2	361.554	18	green denominator	4	197.269
4	the two rivers	4	386.881	19	Diyala	4	328.891
5	Iraqi	4	267.727	20	Karbala	4	212.495
6	Medical specialties	3	0	21	Dhi Qar	4	193.119
7	Computers and Informatics	4	214.365	22	Sumer	4	246.866
8	Mosul	2	287.944	23	Wasit	4	110.593
9	Nineveh	4	252.349	24	Kirkuk	4	61.129
10	Basra	2	162.502	25	Maysan	4	130.628
11	Kufa	2	195.973	26	Double	4	123.66
12	Tikrit	2	588.274	27	Northern Tech	4	216.183
13	Samarra	4	78.847	28	middle technique	4	69.254
14	Qadisiyah	4	294.576	29	Euphrates	4	205.418
15	Anbar	4	441.724	30	Southern Tech	4	239.408

Table (4) shows the classification of universities according to clusters and the distance of each item from the center of the group, where the University of Baghdad was classified within thefirst group and the medical specialties within the third group and the distance was (0.00) and the rest of the universities as shown in the table within the second and fourth groups and accordingto the distance from the center of the group The farthest distance to Tikrit University was (588.274).

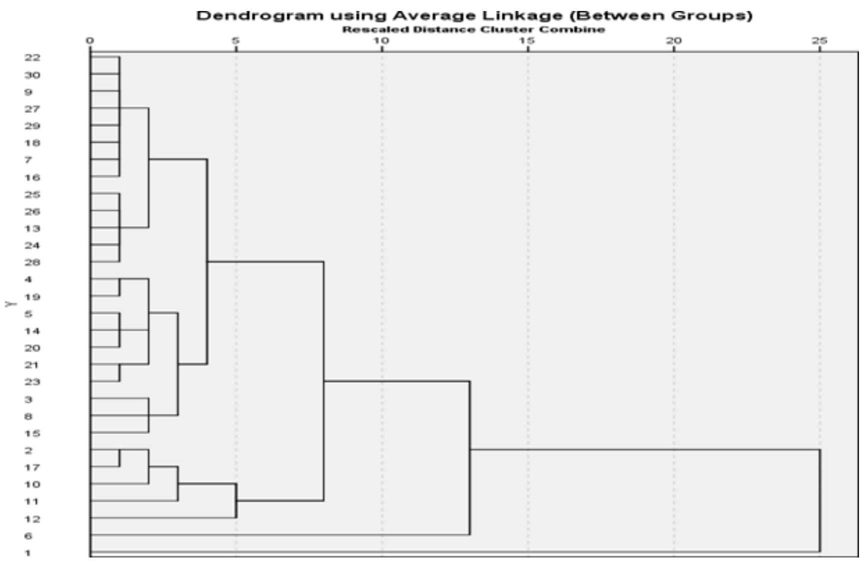

Figure 2 shows a cluster tree

The length of the line indicates the lack of similarity between universities, and this indicates the presence of factors that are not common between these universities. We note from Figure (2) thatthe University of Baghdad was singled out by one cluster and the rest of the universities by one cluster, and this is evident from the number of students because it is one of the largest Iraqi universities and the multiplicity of colleges and departments in it.

In the second stage, the University of Baghdad formed a cluster, the majors were a cluster, and the rest of the universities were a cluster. In the third stage, the University of Baghdad was a cluster (1) and the University of (Al-Mustansiriya, Basra, Kufa, Tikrit and Babylon) was clustered (2) and the rest of the other universities were clustered (3) and the medical specialties were uniquely clustered (4).

Table (5) shows one-sided analysis of variance for each variable

	Cluster		Error		F
	Mean Square	df	Mean Square	df	
Male higher diploma	40224.703	3	572.264	26	70.29
Female high diploma	39239.797	3	451.3	26	86.948
male masters	1492437.098	3	36764.791	26	40.594
Female Masters	2031505.968	3	23491.004	26	86.48
male PhD	972742	3	7586.769	26	128.216
PhD female	700877.791	3	2565.234	26	273.222

For the purpose of showing the extent of the difference between groups and according to the averages of the variables and depending on the value of (F) shown in Table (6), we find that the average number of students has the largest difference (F = 273.222) at (Female Ph.D.), while we find that the average number of students at (Male Masters) has the lowest percentage difference(F = 40.594).

Note: (The F-test is used only for descriptive purposes because the groups were chosen on the basis of differences between cases in different groups. They cannot be interpreted as tests of the hypothesis that the blocks are equal).

8- Analyze the Hierarchical logarithmic linear model

The logarithmic linear model is used in data analysis to study the relationship and effect between the variables and by using the hierarchical filtering method.

A table representing the number of cells and residuals with the observed and expected values and

Table (6) . Cell Counts and Residuals

H.D.	M.A.	PhD	Observed Count	Observed %	Expected Count	Expected %	Residuals	Std. Residuals
NO	NO	NO	.500	0.0%	.500	0.0%	.000	.000
		YES	2258.500	6.4%	2258.500	6.4%	.000	.000
	YES	NO	554.500	1.6%	554.500	1.6%	.000	.000
		YES	2671.500	7.6%	2671.500	7.6%	.000	.000
YES	NO	NO	.500	0.0%	.500	0.0%	.000	.000
		YES	.500	0.0%	.500	0.0%	.000	.000
	YES	NO	.500	0.0%	.500	0.0%	.000	.000
		YES	29572.500	84.4%	29572.500	84.4%	.000	.000

the percentages of higher studies according to each study. The table shows that the universities in which there are master's and doctoral studies without a higher diploma study is (7.6%), and the percentage of universities that provide the three studies is (84.4%).

Table (7). K-Way and Higher-Order Effects

	K	Df	Likelihood Ratio		Pearson		Number of Iterations
			Chi-Square	Sig.	Chi-Square	Sig.	
K-way and Higher Order Effects	1	7	104996.739	.000	167379.553	.000	0
	2	4	12058.578	.000	16927.481	.000	2
	3	1	.000	.984	.000	.984	3
K-way Effects	1	3	92938.162	.000	150452.071	.000	0
	2	3	12058.577	.000	16927.481	.000	0
	3	1	.000	.984	.000	.984	0

Table (7), which shows the process of interaction between the variables and any of these interactions are excluded from the estimated model, where we find that the triple interaction has the highest value of (sig = 0.984), and this indicates the insignificance of the triple interaction between the variables, so this interaction is excluded and through the table The significance of the binary reaction is shown, but no binary reaction has been excluded, and this can be known from Table (8).

Table (8) Parameter Estimates

Effect	Parameter	Estimate	Std. Error	Z	Sig.
Diploma * Master * Ph.D.	1	-2.229-	0.354	-6.303-	0
Diploma * Masters	1	0.476	0.354	1.346	0.178
Diploma * Ph.D.	1	0.125	0.354	0.353	0.724
Masters* Ph.D.	1	0.518	0.354	1.465	0.143
Higher Diploma	1	1.628	0.354	4.603	0
M.A.	1	-2.271-	0.354	-6.422-	0
Ph.D.	1	-2.622-	0.354	-7.415-	0

Table (8) in which the highest Z value is significant for binary interactions, whichshows that there are no statistically significant binary interactions.

Table (9) . **Step Summary**

Step[a]			Effects	Chi-Square	df	Sig.	Number of Iterations
0	Generating Class		Diploma * Master * Ph. D	.000	0	.	
	Deleted Effect	1	Diploma * Master * Ph. D	.000	1	.984	3
1	Generating Class		Diploma * Master *, / Diploma * Ph. D, /Master * Ph. D	.000	1	.984	
	Deleted Effect	1	Diploma * Master	9879.400	1	.000	2
		2	Diploma * Ph. D	2661.628	1	.000	2
		3	Master * Ph. D	631.214	1	.000	2
2	Generating Class		Diploma * Master, / Diploma * Ph. D, / Master * Ph. D	.000	1	.984	

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Table (9), which shows the steps for deletion according to the steps, we note that in the third step, the triple effect was deleted, and so in the second step, the effect of binary interactions wasexcluded.

Table (10). Goodness -of- Fit Tests			
	Chi-Square	Df	Sig.
Likelihood Ratio	.000	1	.984
Pearson	.000	1	.984

Table (10) represents the quality of good matching, and as we can see, the value of (sig= 0.984), which is greater than 0.05, and this indicates that the hypothesis that says that there are no statistically significant differences between the expected value and the observed value is not rejectedand is good model.

DISCUSS THE RESULTS

1) Universities were classified into four groups, depending on the number of students admitted to postgraduate studies by type of study and gender. The first group was represented by the University of Baghdad, the second was represented by the universities (Al-Mustansiriya, Basra, Kufa, Tikrit and Babylon) and the rest of the universities were in the third group, and the medical specialties were unique to the fourth group.

2) In the form of a tree (dendrogram), the length of the line indicates the degree of dissimilarity between universities, and that the length of this line was for the University of Baghdad, where the university was the largest in the number of accepted students.

3) Universities reduced from 30 universities to four homogeneous clusters, including in the field of accepting student numbers. The universities (Baghdad, medical specialties) had special preparations for admission, and the universities (Al-Mustansiriya, Basra, Kufa, Tikrit and Babylon) were similar in the preparation of admission, as well as the rest of the other universitieswere similar in terms of the numbers of students accepted in postgraduate studies.

4) The table of analysis of variance for variables based on the number of students through the calculated (F) value showed a significant difference between the number of students accepted in the type of study and gender. The most significant difference was between male master's students and female doctoral students.

5) We note that in the tree the measurements extended up to (25) units of measurement, and the length of the line indicates the degree of dissimilarity between universities The length of this line belonged to the University of Baghdad, as it was the first university to prepare students for studies.

6) The logarithmic analysis also showed the percentages of the three studies (HB, MA, PHD)and they were (84%), which are almost equal in most universities, and this is a good indicator that most universities have the same opportunities.

7) The logarithmic analysis showed that the interaction between the three studies was not significant, and this means that there are no equal opportunities among the three studies in the same university, and there are large differences between the number of students admitted to the same university.

8) We recommend the Ministry of Education to give equal educational opportunities between universities, by providing teaching staff and opening postgraduate studies in all its

departments of universities.

9) Open departments for colleges with all their specializations so that students do not have to apply to universities outside their places of residence in search of the required specialization which causes more burden and expense on students.

10) Paying attention to universities (Nineveh, Sumer, Fallujah, Technical University in the northern and southern regions) because they are the weakest share of graduate studies in relation to the rest of the universities across the country, followed by (Technical University in the Middle Euphrates, Al-Qasim Al-Khadra, Iraqi Authority for Computers and Informatics).

REFERENCES

1. J. J. Brey and A. Prados, 24 January 2001. (Slow logarithmic relaxation in models with hierarchically constrained dynamics), PHYSICAL REVIEW E-covering statistical, nonlinear,biological, and soft matter physics.
2. Jeroen K. Vermunt,2005. (Log-linear modeling), Department of Methodology and Statistics, Tilburg University, Chichester, UK: John Wiley & Sons Inc, Publication date
3. Kevin Kam FungYuenaHenry C.W. Lau, 2011. (A fuzzy group analytical hierarchy process approach for software quality assurance management: Fuzzy logarithmic least squares method), Expert Systems with Applications, Pages 10292-10302.
4. Lamees M. Al-Durgham, Mahmoud A. Barghash, July,2015(Factor and Cluster Analysis as a Tool for Patient Segmentation Applied to Hospital Marketing in Jordan) American Journal of Operations Research, 5, 293-306.The University of Jordan, Amman.
5. Mustafa, Nizar,2-2007. (Using some methods of cluster analysis in classification with practical application) - Al-Taqni Journal / Volume 20 / Issue.
6. Odilia Yim, Kylee T. Ramdeen,2015. (The Quantitative Methods for Psychology Hierarchical Cluster Analysis: Comparison of Three Linkage Measures and Application to Psychological Data), a School of Psychology, University of Ottawa-Centre National de la Recherche Scientifique, Grenoble, France, vol. 11 _ no. 1.
7. Postgraduate Statistics: Cluster Analysis Dr. Andy Field 2/5/2000.
8. Ralf Metzler, Joseph Klafter, Joshua Jortner, September 28, 1999. (Hierarchies and logarithmic oscillations in the temporal relaxation patterns of proteins and other complex systems), Contributed by Joshua Jortner, Institution: Iraq: PNAS Sponsored.
9. Richard Lampard, 2014. (Logistic Regression II/(Hierarchical) Log-Linear Models I) University of Warwick, Department of Sociology.
10. Sadr El-Din,2011 (Soualili, data analysis), Algeria.
11. support centre - mathemitics learing Statistics: 3.1 Cluster Analysis - Rosie Cornish.
12. Yaqoub, Asmaa Ayoub, March,2017 (Clustering and Discriminatory Analysis in an AppliedStudy on Some Iraqi Banks), Statistics Department / College of Administration and Economics - University of Basra - Gulf Economic Journal -. Issue.
13. Ying-MingWangaKwai-SangChin, June 2011. (Fuzzy analytic hierarchy process: A logarithmic fuzzy preference programming methodology), International Journal of Approximate Reasoning.

"TIME MANAGEMENT" AS A STRATEGY FOR IMPROVING THE WORK EFFECTIVENESS

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ABSTRACT

The statement that "Time is money" is an unwise statement. The old Chinese proverb says "an inch of time equals an inch of gold is worth, but an inch of gold cannot replace an inch of time." The fundamental solution to the problem of time is: What is meant by time? What about time management? How wise is the basis for the process of managing time? How is wise time management as an exemplary pattern for Christian leaders in increasing work effectiveness? Answer: (1) Time never stops and it keeps flowing unstoppable. Time is all the events that occur in the life of every human being. (2) Time management is the management of time as effectively as possible for a person's life in accordance with his life goals, which include: taking care, organizing his life properly, considering which things are important, and which are not important. (3) Wisdom is being obedient to the corridor. Fear of God and his life is always under His guidance. Wisdom is only obtained by relating to God and reading His Word, because through the Word and practiced in daily life it will make people wise. (4) Wise time management as an exemplary pattern of Christian leaders in increasing the effectiveness of the leader's work using time as effectively as possible, praying, increasing prayer hours, doing work (planning, avoiding getting trapped in many activities, discipline, and priorities), increasing reading, associating selectively. , and time accountability as well.

Keywords: Management, time, wise, Effectiveness

INTRODUCTION

In general, every human being who lives in the world has the same time, 24 hours a day, 7 days a week, 31 days a month, 365 days per year, but most of them do not know how to manage time and manage it so that it becomes something useful, effective and efficient (Wicak, 2008: 44). This is because many people do not have the discipline to pass the time. Their days are filled with things that are not directed, even more severe is those that fill the time of their life with things that destroy the life. Whereas wasting time is a sin because wasting the opportunity God has given and time that has passed will not come back, meaning that if the opportunity is not used, then the opportunity will be lost (Octavianus, 1986: 36). This is in line with what Sanders said that time can be lost, and it cannot be recovered, time cannot be saved because it is used. Time also cannot be postponed, if it is not used productively, then time will be lost and cannot be recovered. For that, don't waste your time (Sanders, 1974: 96).

From the above statement it is clear how important time is for humans. The Bible also writes about the importance of the task of managing and managing the time entrusted by God to His children. As one example, the creation story explains that Allah not only regulates the order of His creation, but also He arranges the time to create it, not only the universe and everything in it, but also time which is an inseparable part of God's creation. Thus, God's commandment to man, also implicitly includes the management of time. God's gift is not only material in the form of money, but time is also a gift from God that has been entrusted to humans. In other words, humans must be able to manage their time properly. Because it is not only a financial problem that must be regulated and organized, but also a matter of time. One of the devil's tactics is to involve God's children in useless things that take up time (Rush, 2002: 153).

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Paul also calls on the church at Ephesus to take advantage of their time because the days are evil. Evil is a state of the age that has been controlled by tyrannical powers so that it causes evil in a matter of hours, minutes, seconds so that it is difficult for everyone to live in righteousness (Calvin, 1996: 314). The purpose of Paul's advice to the church at Ephesus emphasized that they would be able to make good use of their time in the midst of the forces of evil so that the opportunities God gave them would not be in vain. For that, everyone is responsible for the use of time, especially a spiritual leader must be able to streamline his life and manage his time well, so that the time he passes is used for a life that glorifies God. The great leader of the Israelites, Moses considered time to be a priceless staple, so he prayed for a wise heart and was taught to count the days, not years A wise heart is a heart that "knows the power of God's wrath." To obtain a wise heart, humans need to be guided by God to ask to be taught so that the days of his life are filled with God's loyal love, not His wrath (Barth, 1999: 160).

The meaning of the verse above should change the thinking of church leaders today. For example, Augustine, one of the church fathers, for 15 years has spent his time with many women and is living in adultery. So much time was wasted by Augustine that he was converted at the age of 32 and worked for God. From the story, it reminds us how important the use of time is, so a leader must be careful in choosing his priorities. Church leaders must realize that time is their most valuable resource, because the quality of a person's leadership is expressed as long as he leads and is filled with something that is effective and efficient (Sanders, 1974: 95).

The basic question of time to answer is: What is meant by time? What about time management? How wise is the basis for the process of managing time? How is wise time management as a pattern of increasing the effectiveness of the work of Christian leaders?

METHOD RESEARCH

The method used in this writing uses a descriptive analysis method which contains a description and explanation of the problem of the data obtained (Surakhmad, 1998: 456). Meanwhile, the writing procedure begins with the search for materials in accordance with the subject matter, both from libraries and other media such as journals, magazines, or the internet. And the book that becomes the reference is Stephen tong about wisdom and time because it contains time management from a biblical perspective, Oswald Sanders spiritual leadership as well as Octavianus management and leadership according to God's revelation about the practice of time management with leadership. Also the book by Wicak and Jane Smith on the view of secular time management which is used as comparative material so that the data that has been obtained are analyzed and finally outlined in the form of a scientific research.

RESULT AND DISCUSSION

Definition of Time

A Chinese writer said "Time is something that is invisible, but so real." Time is walking and passing between human legs. At bedtime, time is passing around the bed. This provides evidence to a person that consciously or unconsciously time has been used. Heidegger, one of the greatest German thinkers, said that humans must live authentically, live in time. Jean Paul Sartre goes even further to say that states of being are swallowed up by non-existence. That is, life now can enjoy everything, but one day at death, everything is finished and there is nothing (Tjahyadi, 2008).

The essence of time can be understood as follows: (1) Time is the essence of a process in the world that is relatively related to the process. In this world, nothing is eternal, only Allah because He does not need the process. He is the One Who Exists from Eternal to Eternal. In contrast, everything that is created in the world undergoes a process, and in the human process it

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takes time. That is why time is the essence of process in the relative world. (2) Time is a reality related to space. Everything that God created has three of the most important elements: Space, Time and Existence. Often there is a mistake in the way of thinking of humans because they only see space as a container for accumulating property and never see time as a place for humans to be wiser again. A wise person is sensitive to time, and time is in balance with space; this person will have tremendous power in his life (Tong, 1990: 31-36). (3) Time has a purpose, so the purpose of human life is not only to earn money and become famous, but to know Christ as Lord and Savior and serve Him by living and proclaiming His gospel.

In this regard, the statement that "Time is money" is an imprudent statement. Time is not money. If time is money, then one can exchange time for money. An old Chinese proverb says "an inch of time equals an inch of gold is worth, but an inch of gold cannot replace an inch of time". If western people say "Time is money", then eastern people (Chinese) say Time is money, but money is not times. If time is not money, how do people perceive time? (1) Time is life. This is an important lesson for the life of every human being how much time has been wasted in vain from young to old, his life is filled with a life of extramarital life, orgies without doing the most important thing in this life. If humans really love themselves, begin to love the time that is in living alone; what can be done now, do not delay until tomorrow. What can be learned in youth, do not wait until old age. (2) Time is opportunity. In Greek mythology, the god of opportunity is depicted with a bald head on the back and hair only in the front, and has wings on his feet, so that if the god of opportunity runs very fast. This god of opportunity rarely passes, so humans have to look for him. If the god of opportunity passes and humans try to chase him, he can't possibly catch up because he has wings on his feet. Besides, one could not catch it from behind because the back of the head was bald. Likewise, opportunities come before humans, so don't waste it and catch it and do it. (3) Time is a record. All events that occur in the life of every human being are a history and of course, it is a part of every human being that cannot be forgotten because it becomes a memory and a record for humans themselves (Tong, 37-38).

Time, for the Greeks is divided into 64 tenses. English has 16 tenses. Indonesian does not recognize a system like this. The Greeks recognized two terms, namely: kairos and kronos which have the following meanings: Kairos is the concept of time that makes a person effective and works harder. Kronos is the time that flows and lives by all the people in this world just like that. Time 24 hours a day circling and lived continuously (Brown, 1999: 838). So, the time of the chronos goes with the flow of life without any important moment in it.

Time Management

The word management (management) comes from the Italian word, maneggiare which more or less means to handle or to handle. In Latin, manus which means hand or handle (Octavianus, 1986: 1). Terry said that management is a unique process, which consists of the following actions: Planning, Organizing, Activating and Supervising which are carried out to determine and achieve predetermined goals through the use of human resources and other resources (Sutedja, 29).

Covey suggests four definitions of management that are commonly used in everyday life (Covey, 2004):

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	Urgent	Not urgent
	I ACTIVITY: Crisis An urgent matter Time-driven projects	II ACTIVITY: Prevention, KP activities Development of relationships Introduction of new opportunities Planning, recreation
Not Important	III ACTIVITY: Interuption, many calling Some post and dan Report Some Meeting Things Urgently Popularly Activity	IV ACTIVITY: Trivial things, busy work Some posted Some calling Wasting Time Pleasant Activity

Table 1 Important and Urgent Quadrants (Source: Covey, 2004: 151)

Furthermore, Harbison and Myers classified management into three types, namely: (1) Patrimonial Management. There is when a company is owned by a family and important positions in the company hierarchy are controlled by members of the family. (2) Political Management. A form of management in which important and basic positions in the organization are held by those who have political relations based on loyalty to a certain political party. (3) Professional Management. Strategic and important positions are left to those who have provided evidence of their abilities, capacities, abilities, expertise or in other words on the basis of the services and results they provide to the company (Harbison and Myers: 1998).

Management strategic techniques and the application of clear individual functions make the company's management performance more enthusiastic and also survive from competition as well as healthy competition, because these individuals show proficiency and loyalty to the company so that the company's performance increases. This is because, in essence, management functions as Planning, Implementation and Evaluation. However, in the implementation of these basic functions, flexibility can be developed according to the needs of the organization. Dessler (Wiryopuro, 2001: 9) describes the basic functions of management are: (1) Planning. Includes goal setting, action, developing rules and procedures, developing plans and making predictions. (2) Organizing. Includes assignment, divisions, delegation of authority, coordinating work. (3) Staffing, including employee recruitment, training and development. (4) Leading, including giving orders, maintaining employee motivation and morale. (5) Controlling, determining standards, making improvements if necessary.

The Concept of Time Management

As long as humans live on this earth without using their time wisely, how much time is wasted? And if you want to be honest and calculate, how many hours have been wasted. Suppose that the age of a human being up to 60 years, and one has wasted 1 hour every day till 17 years of age when he was young, meaning he has wasted 15695 hours of time, or 1961 working days (1 work day = 8 hours) or 5 more years of work, the amount of time for so long, it will be very meaningful if it is filled and used with useful things (Anwari, 1984: 27). It is very wise to plan the use of time carefully to record what activities you want to do. By getting used to noting what you want to do, you train yourself to be even better. The following is a table of activities.

Table 2. List of Activities in Hours

Activity	In Hours
Rest/Sleeping	8 Hours
Eating	1 Hours
Take a bath/ Make a dressing	2 Hours
Working	8 Hours
Chaple Service	1 Hour
Conversation with families/friends	2 Hours
Reading Boooks	2 Hours

From the list of activities that can be recorded, it turns out that the remaining time from 24 hours a day is only 2 to 3 hours. That, too, if worship activities are carried out routinely 1 hour a day. From here it is time to change the paradigm of thinking how to use time properly and have a purpose and in the end not regret it.

People who know how to value time and know what to do, must have an effective life purpose. Effective is the ability to take care, organize one's life well, consider which things are important, and which are not important (Smith, 2002: 9). Because in the effective itself there is a responsibility that is able to achieve the target as the final target, not just a goal. In that effectiveness there is the power of the attitude of "Self Control" in high discipline in using time. Life itself is getting more organized and time is used more properly.

Time Management as a Performance for Increasing Work Effectiveness of Christian Leaders

A leader is someone who influences and determines the activities of others and acts to realize these activities to achieve goals. The leader has the ability to recruit, influence, instill trust, and develop responsibility in others to do a certain job to achieve certain goals (Hayforsd, 1993: 42-43). But in a Christian context, Plessis and Nkambule (2020: 8) call it "Servant leadership as part of spiritual formation". This leadership image serves for spiritual formation. These leaders are imprints of leaders like Moses, David, Paul and Jesus Christ.

Maxwell said that leadership is influence (Maxwell: 2001). John Robert Clinton said a leader is someone who has the capacity and responsibility given by God, who influences a group of followers towards God's plan for a group of followers towards God's plan for the group (Clinton: 2004). Thus, leadership is an art that specializes in articulating organizational insights and creating the conditions necessary to achieve these goals.

Orr said that a leader is someone who sets an example and has a compelling vision that transfers that vision through the influence of equipping, carrying out, training, building, challenging, motivating, empowering, energizing, training, facilitating, inspiring, developing, strengthening, encouraging, enabling another person or group of people (as a team) and trying to achieve the vision, plans, goals and objectives that have been set. (Orr: 1998). Thus, a leader is someone who has the capacity and responsibility given by God to influence a certain group of God's people towards God's plans for that group.

So, leadership is not just an art, but a matter of influence in which there is an element of reason or science. Because when leading what is needed is not only a beauty and power, but also a rational or scientific side. Both are very much needed in leadership.

Colquitt et al, (2009: 37) argues that performance management is the value of a set of employee behaviors that contribute positively or negatively to achieve organizational goals. Basically, performance has three dimensions, namely (a) task behavior, (b) moral behavior, and (c) challenging behavior.

John B. Minner (2010: 170) defines performance management as follows, performance is how a person is expected to function and behave in accordance with the tasks that have been assigned to him. Performance theory according to Schermerhorn et al, (2010: 76) is that to determine organizational and individual performance can be seen from 5 (five) influencing factors, namely; (a) Knowledge, (b) Skills, (c) Ability, (d) Attitude, and (e) Behavior. On the other hand, Schermerhorn et al, revealed the ability and skills as individual factors for each worker. The more competent the abilities and skills of each worker, the more likely it will affect the achievement of performance results.

Kritner and Kinicki (2008: 166) which states that Commitment to Organization is the degree to which an individual identifies himself with an organization and its goals. Kritner and Kinicki (2008: 166) which states that Commitment to Organization is the degree to which an individual identifies himself with an organization and its goals. Commitment to the Organization consists of three separate but interconnected components: (a). Affective commitment. (b). Normative commitment, and (c). Continuous commitment. Commitment to organization is the identification of lecturers who are divided into dimensions of affective commitment which includes the desire to continue working in the institution, make every effort to succeed the goals of the institution, be involved in every activity in the institution; The dimensions of normative commitment include the desire to fulfill obligations in the institution, the obligation to remain in the institution, while the sustainable dimension includes the desire to consistently carry out the same activities, awareness of the costs of leaving the institution.

Commitment to the Organization is an attitude that reflects the extent to which an individual knows and is tied to the organization. Someone who has a commitment will definitely be involved, namely trying their best and being loyal to the organization, namely remaining a member of the organization. Commitment to the organization is the identification of lecturers who are divided into dimensions of affective commitment which includes the desire to continue working in the institution, make every effort to succeed the goals of the institution, be involved in every activity in the institution; The dimensions of normative commitment include the desire to fulfill obligations in the institution, the obligation to remain in the institution, while the sustainable dimension includes the desire to consistently carry out the same activities, awareness of the costs of leaving the institution. Performance for management can increase commitment to the organization, if each task and job is in accordance with the right place and also according to their expertise. Management performance is a hope for both leaders and institutions, because high performance will increase leaders' commitment so that it will be very helpful in achieving organizational goals.

CONCLUSION

Time never stops and it keeps flowing unstoppable. Time is all events that occur in the life of every human being is a history and of course it is a part of every human being that cannot be forgotten because it becomes a memory and a record for humans themselves.

Time management is time management as effectively as possible for a person's life in accordance with his life goals. Effective is the ability to take care of him, organize his life properly, consider which things are important, and which are not important. In an effective process, it means that someone is able to manage himself in a highly disciplined manner in using time.

Wise is to obey the corridor. Fear God and his life is always in His guidance. Wisdom is only obtained by relating to God and reading His Word, because through the Word and practiced in daily life it will make people wise. Wisdom speaks of combining spirituality and living practices according to the will of God Jesus Christ as a source of wisdom. One must be right in the attitude of trying to find and do God's will. Corridor with God is the process of one's life from time to time only with God.

Wise time management as an exemplary pattern of Christian leaders in increasing the effectiveness of leaders' work using time as effectively as possible, praying, increasing prayer hours, doing work (planning, avoiding getting trapped in many activities, discipline, and priorities), increasing reading, interacting selectively, and being accountable time well.

REFERENCES

- Anwari, M.S. *Peranan Penatalayanan dalam Pengembangan Jemaat.* Malang: Gandum Mas, 1984.
- Barclay, William. *Galatia-Efesus.* Jakarta: BPK Gunung Mulia, 1983.
- Barth, Marie. C. *Tafsiran Mazmur 73-150.* Jakarta: BPK Gunung Mulia, 1999.
- Brown, Collin. *The New Internatinoal Dictionary of The New Testamment Theology Vol 3.* Michigan: Zondervan Publishing House Grand Rapids, 1999.
- Calvin, John. *Ephesians.* Michigan: Baker Book House, 1996.
- Colquit, Jason A., Wesson, *Organizational Behavior*, New York: McGraw-Hill.Irwin, 2009
- Colquitt. Jason A., Jeffery A. Lepine., and Michael J. Wesson., *Organizational Performance and Commitmen in theWorkplace*. New York: McGraw-Hill,2009
- Cook, Curtis W. dan Philip L. Hunsaker, *Management and Organizational* (Diterjemahkanoleh Diana Angelica) Jakarta: SalembaEmpat, 2006.
- Champoux, Joseph E. *Organizational Behavior-Essential Tenets.* ThomsonSouth-Western 2003
- De Janasz, Suzanne C., Karen O. Dowd, Dan Beth Z. Schneider, *Interpersonal Skills In Organizations* New York: McGraw-Hill International Edition, 2009
- Clinton, J. Robert. *Pembentukan Pemimpin Sejati*. Jakarta: Metanoia, 2004.
- Covey, S. R. *The 7 Habits of Highly Effective People*. New York: Free Press, 1989.
- Du Plessis, A.L. & Nkambule, C.M. (2020). “Servant leadership as part of spiritual formation of theological students in contextualisation of 21st century theological training”, *HTS Teologiese Studies/ Theological Studies* 76(2), a5959. https://doi.org/ 10.4102/hts. v76i2.5959.
- Earle, Ralph. *Word Meaning in The New Testament.* Michigan: Baker Book House Grand Rapids, 1983
- Hayford, Jack. *Memenangkan Masa Depan.* Yogyakarta: Andi, 1993.
- Harbison, F. Dan Myers, C. *Education, Manpower, and Economic Growth: Strategis of Human Resource Development*. New York: McGraw Hill, 1998.
- Hill, Andrew E. *Survei Perjanjian Lama.* Malang: Gandum Mas, 1996.

- Huang, Sewie Elia. "Doa Puasa di antara Kepemimpinan Penggembalaan, Roh Kudus, dan Pertumbuhan gereja". *Jurnal Excelsis Deo*, 4(1), 35-50. Doi: https://doi.org/10.51730/ed.v4i1.29.
- Ladd, George Eldon. *Teologi Perjanjian Baru Jilid I.* Bandung: Yayasan Kalam Hidup, 1999.
- Lakein, Alan. *Waktu dan Sukses.* Semarang: Dahara Prize, 1997.
- Lenski, R.CH. *Comentary on The New Testament.* Minnesota: Publisher Amerika Hendriksen, 1987.
- Linclon, Andrew T. *Word Biblical Comentary Ephesians.* Dallas: Word Books Publisher, 1990.
- Luwis, Render Bin. (2020). "Model Pendidikan Keteladanan Kepemimpinan: Tantangan Pengembangan Sumber Daya Manusia", *Jurnal Excelsior Pendidikan*, 2(1), 1-22. DOI: https://doi.org/10.51730/jep.v1i1.2.
- Maxwell, John C. *Developing The Leader Within You*. New York: Injoy, Inc., 2001.
- Octavianus, P. *Manajemen dan Kepemimpinan menurut Wahyu Allah.* Malang: Yayasan Persekutuan Pekabaran Injil Indonesia, 1986.
- Orr, Robert A. *The Essential for Effective Cristian Leadersip Development*. Washington D.C.: Leadership Essentials Press, 1998.
- Packer, J.I. *New Dictionary of The Theology.* Leicester: Intervarsity Press Downers Grove, 1988.
- Rush, Myron. *Manajemen menurut Pandangan Alkitab.* Malang: Gandum Mas, 2002.
- Ryrie, Carles. *Teologi Dasar 1.* Yogyakarta: Andi Offset, 1991.
- Sanders, Oswald. *Kepemimpinan Rohani.* Malang: Gandum Mas, 1986.
- Smith, Jane. *Time Manager Mengelola Waktu secara Efisien.* Jakarta: Gramedia, 2002.
- Stoot, John R.W. *Efesus.* Jakarta: Yayasan komunikasi Bina Kasih/OMF, 2003.
- Surakhmad, Winaryo. *Pengantar Penelitian Ilmiah.* Bandung: Tarsito, 1998.
- Sutedja, Junias Darma. *Diktat Pertumbuhan Gereja.* Surabaya: GPPS, t.th.
- Stenschke, C.W., 2020, Lifestyle and leadership according to Paul's statement of account before the Ephesian elders in Acts 20:17–35', *HTS Teologiese Studies/Theological Studies* 76(2), a5901. https://doi.org/ 10.4102/hts. v76i2.5901.
- Swindoll, Carles. *Bekerja Sama dalam Membangun.* Surabaya: Yakin.Tong, Stephen. *Waktu dan Hikmat.* Surabaya: Momentum, 1990.
- Tjahyadi, Sindung. (2008). "Manusia dan Historitasnya menurut Martin Heidegger", *Jurnal Filsafat*, 18(1). Https://media.neliti.com/media/publications/84925-ID-manusia-dan-historisitasnya-menurut-mart.pdf.
- Wang, Suryowati. "Manusia dan Dunia: Konsep Kristologi dengan Perspektif Reformed". *Jurnal Excelsis Deo*, 4(1), 61-72. DOI: https://doi.org/10.51730/ed.v4i1.31.
- Wicak. *Mengelola waktu dengan Bijak.* Bandung: Triexs Media, 2008.

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A NOVEL APPROACH IN THE DEVELOPMENT OF AN APPLICATION TO ENHANCE THE CONVENTIONAL ATTENDANCE SYSTEM USING OPENCV

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ABSTRACT
Computer vision technology has a module called Face detection that helps visualize and detect human faces in images and videos. It also detects other features like human eyes and smiles. It plays a vital role in the surveillance system. We developed a real-time facial, eye, and smile detection system using OpenCV and Python programming to manage student attendance records.

Keywords: Face detection, Face recognition, Haar Cascade classifier, OpenCV

INTRODUCTION
During Online classes, it is challenging for the teachers to track daily classroom attendance. The traditional way of calling each student's name and the teacher's need to record the student's attendance and enter them in the corresponding student portal is a time-consuming task. The proposed work aims to develop a system based on face recognition by OpenCV to manage student's attendance records.

The prime objective of this work is to facilitate hassel free interactions between humans and machines (computers). In biometrics research, face detection from image and video is a widespread technique. The human face is multidimensional, dynamic, and sophisticated, conveying a lot of information, including expression, feeling, etc. Haar cascades are already being trained with some input data using a machine learning-based approach, which is used in face detection. In this article, using a regular webcam, the device can use computer vision to detect faces, eyes, and smiles, and provide detection information. Human face recognition is one of the main things to detect digital images in the application of video surveillance cameras, attendance-based systems, database management approaches, etc. This paper focuses on developing an attendance system using OpenCV.

TECHNOLOGY USED
1.1 OpenCV
Computer vision is an area where computers gain knowledge from images and videos and learn to understand and interpret them and automate the task, simplify things find solutions similar to that of the human visual system identifies interpret things and comes to a conclusion. It is abbreviated as CV. Computer vision is linked to artificial intelligence to interrupt and analyze what is seen.

Computer vision has the most popular library called OpenCV. It is written in C, C++, and Python. OpenCV uses machine learning algorithms to find faces in images. We cannot find faces with simple patterns, so OpenCV uses complicated patterns and features that must match. Classifiers are used to break the enormous task into smaller tasks that can be solved easily.

1.2 Cascades
The theory may sound complicated, but it is quite easy. Open CV data uses a bunch of XML files called cascades used to detect objects. According to the work that has to be done, you

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initialize your code with cascade. Since face detection is used in many places, there are many built-in functions in OpenCV for detecting everything from face to legs.

System architecture

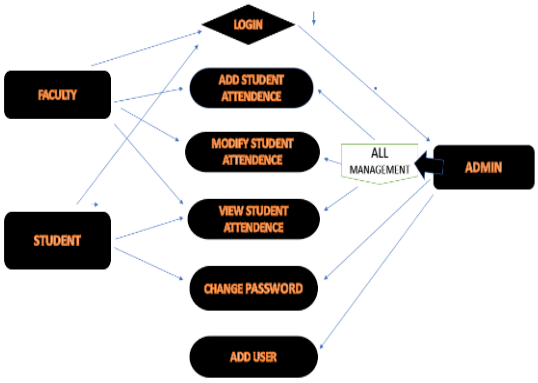

Fig 1 System architecture

Detection techniques

4.1 Face detection using a webcam

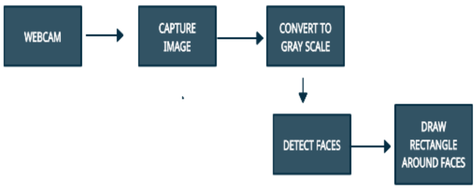

Fig 2 Face detection using a webcam

The first step is to load the Frontal face using the haar cascade classifier method from cv2 with the following command:

“face_cascade=cv2.CascadeClassifier

('haarcascade_frontalface_default.xml')”
Next, by using a webcam, we are capturing the video. We are using the video capture function of the cv2 module and loop runs if capturing has been initialized. After that, to read frames from the video, we are using the read function of the cv2 module.

“Capture = cv2.VideoCapture(0)

While True:

success, img = “Capture. Read() ”

We converted the RGB image into a grayscale image using the Function cvtColor defined in the module cv2. The function cvtcolor needs two mandatory parameters. "src" – Color space of the image to be changed, and "code" – Conversion code for color space. We have used cv2.COLOR_BGR2GRAY, as we need to convert the source BGR image into a grayscale image.

“ Gray=cv2.cvtColor

(img,cv2.COLOR_BGR2GRAY) ”

Then, at that point, we need to run the face finder on the grayscale picture with the accompanying line with Scale Factor set to 1.3 and MinNeighbors set to 20 .

“Faces=face_cascade.detectMultiScale(gray,1.3,20)”

Where the parameters are:

a) **Scale Factor**: Scale Factor is used to rescaling your input image to the size you want (i.e.) smaller to larger face vice-versa. The scale factor is used to build your scale pyramid. For example, the value of the scale factor is 1.04, and it means that we use a smaller step to change the size, i.e., reduce the size by 4%, in this way the possibility of a size that matches the model for detection is found

b) **MinNeighbors**: By using this Parameter, we can reduce false detected faces to get accurate face detection. For example, if the min neighbor value is 0, we get many false face detections by increasing the size to get precise detection. The quality of detected faces will be affected by using MinNeighbors. If the values are higher, we will get higher quality.

a) **MinSize**: Refers to the minimum possible object dimension. The object dimension is less significant than that is ignored.

b) **MaxSize:** Refers to the maximum possible object dimension. The object dimension is more significant than what is ignored.

We reiterate through the recognized faces and draw rectangles all over them for (i,j,k,l) in faces by using the command,

“cv2.rectangle (img, (i,j),(i+k,j+l),(0,0,225),2)”

4.2 Eye detection using a webcam

The first step is to load the eye using the haar cascade classifier method from cv2 with the following command:

“eye_cascade = cv2.CascadeClassifier

("haarcascase_eye.xml")”

Next, to capture video from the webcam, we use the video capture function of the cv2 module loop runs if capturing has been initialized. After that, to read frames from the video, we are using the read function of the cv2 module.

“Capture=cv2.VideoCapture(0)

While True:

success, img = Capture.read ()”

The Third Step is to convert an RGB video to a grayscale video using cvtColor defined as cv2 using two parameters, “src” and “code.”

We use cv2.COLOR_BGR2GRAY, as it is necessary to convert BGR video into a grayscale Video

“Gray=cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)”

Then, at that point, we need to run the face finder on the grayscale picture with the accompanying line with Scale Factor set to 1.3 and MinNeighbors set to 20.

"eyes=eye_cascade. detect Multiscale(eyegray,1.1,22)"

We iterate through the inner loop for outer loop, trace the eyes from video and draw rectangles around them by using ei,ej,ek,el in eyes:

"cv2.rectangle(eye, (ei,ej),(ei+ek,ej+el),(0,255,0),2)"

4.3 Smile detection using a webcam

Follow the similar steps till the conversion of grayscale in eye and face detection.

The next step is to run a face detector on the grayscale image using scale factor value=1.7 (default value) and min neighbor value 22.

"smile=smile cascade.detectMultiScale(smilegray,1.7,22)"

We iterate through the inner loop for outer loop, trace the smiles from video and draw rectangles around them by using ei,ej,ek,el in smiles:

"cv2.rectangle(smile,(si,sj),(si+sk,sj+sl),(225,0,0),2)"

RESULTS & DISCUSSIONS

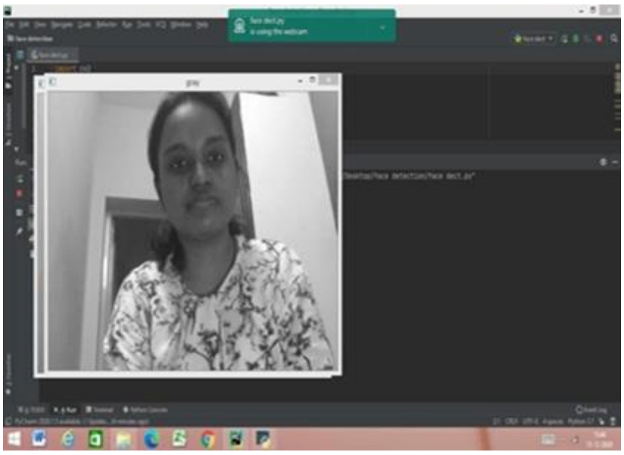

Fig 3 Grayscale image

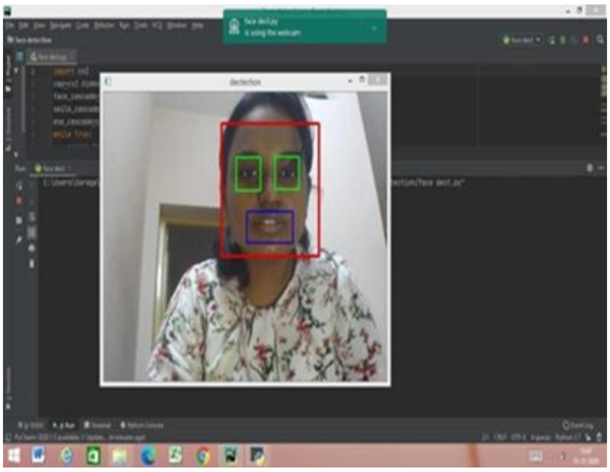

Fig 4 Face, eye & smile detection

CONCLUSION

In the last twenty years, Face detection has become more popular. Nowadays, for transactions, surveillance and any other task can be done by machines. They automatically verify the information and give responses as humans. For creating a face detector, we have used a library called OpenCV. In this paper, we have used the XML file "Haar frontal face" to train the face detector model. Additionally, we've expanded our model to include eyes and smiles, and when implemented to detect attendance, it's much more efficient than other prevailing systems

REFERENCES

- B. Immanuel Sumanth, Dr.C.K. Gomathy, *A MachineLearning Approach To Mark Attendance Using Haarcascade Classifier*, *International Journal For Research &Development In Technology*, *Volume11*, *Issue-3(Mar-19) ISSN (O) :2349-3585:* pp.240-245.
- Pertsau, A. Uvarov, "*Face detection algorithm using haar-like feature for GPU architecture*". 2013 IEEE 7th International Conference on Intelligent Data Acquisition and Advanced Computing Systems (IDAACS). Vol. 2, 2013
- D. Mary Prasanna, Ch. Ganapathy Reddy, *Development of Real-Time Face Recognition SystemUsing OpenCV*, *International Research Journal ofEngineering and Technology,* Volume: 04 Issue: 12 (Dec-2017), e-ISSN:2395-0056, pp.791-798.
- Dana H. Ballard; Christopher M. Brown (1982). Computer Vision. Prentice Hall. ISBN 978-0-13-165316-0.
- Emami, S., & Suciu, V. P. (2012). Facial Recognition using OpenCV. Journal of Mobile, Embedded and Distributed Systems, 4(1), 38-43.
- Face Detection and Recognition using OpenCV, Article, http://shervinemami.info/faceRecognition.html, Published by Shervin Emami, 2010
- http://en.wikipedia.org/wiki/OpenCV
- https://opencv.org/
- https://pythonprogramming.net/haar-cascadeobjectdetection-python-opencv-tutorial/
- Huang, T. (1996-11-19). Vandoni, Carlo, E (ed.). Computer Vision: Evolution and Promise (PDF). 19th CERN School of Computing. Geneva: CERN. pp. 21–25. doi:10.5170/CERN-1996-008.21. ISBN 978-9290830955.
- M.A. Turk and A.P. Pentland, "*Face Recognition UsingEigen faces"*, IEEE conf. on Computer Vision and pattern recognition, pp. 586-591, 1991.
- Milan Sonka; Vaclav Hlavac; Roger Boyle (2008). Image Processing, Analysis, and Machine Vision.Thomson. ISBN 978-0-495-08252-1.
- Viola, P., Jones, M.: Robust real-time face detection. IJCV (2004)

BUSINESS MATCHING MODEL

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ABSTRACT

One factor that encourages the investment climate to run in a positive trend is the ability of organizers to package these investment activities. Positive things that have emerged in line with the increasingly dynamic information technology-based (IT) industry in Indonesia are the increasing number of events with the theme of business matching, investor forums, business networking, and other similar events. This indicates that business players and investors are increasingly interested in IT-based industries. Business matching is the implementation of events that bring together buyers and UMKM producers to communicate about requests and supplies and matters related to them. It can be said that business matching is an activation of the info booth. Business matching is expected to generate real and direct trade. At this point of time, it can be said that the quality of events with the theme of business matching and investor forums is still far from expectations. If we attend events like this, it can be seen that the purpose of holding the event is still not in focus and it is almost certain that the startups featured have not gone through a strategic and well-managed selection process.

Keywords: Business Matching, Startup, Investment

1. INTRODUCTION

In the middle of 2000, Indonesia experienced an economic recession which caused the collapse of the national economy. Finance Minister Sri Mulyani Indrawati confirmed that the national economy was officially in recession in the third quarter of 2020. This follows the revision of projections made by the Ministry of Finance. The Ministry of Finance updated Indonesia's economic projections for 2020 as a whole to minus 1.7% to minus 0.6%. The realization of national economic growth in the second quarter of 2020 was minus 5.32%. A recession will occur if national economic growth returns to negative in the next quarter. A recession is a condition in which economic growth is minus for two consecutive quarters. Even the World Bank projects Indonesia's economy to be at 0%, IMF at minus 0.3%, OECD at minus 3.3%, ADB at minus 1% (Kurniadi, 2020).

The conditions at that time were the majorly of large-scale businesses in various sectors including industry, trade, and services experiencing a slump, even threatening the company's business activities in 2020. However, Micro, Small and Medium Enterprises (MSMEs) were able to survive and become economic recoverers in the midst of adversity due to the economic recession in various sectors of the economy. The MSME sector has proven to be able to withstand the onslaught of the economic recession in 2020.

The role of MSMEs in the Indonesian economy is very important in providing jobs and producing useful outputs for the community. The development of small industries contributes in various ways, namely absorbing labor and providing flexibility and innovation needs in the economy as a whole. For example, during the monetary crisis in 1998, MSMEs made a major contribution to the national economy, namely their contribution to Indonesia's Gross Domestic Product (GDP) in 2015 amounted to 61.41% with a labor absorption capacity of 96.71%. Until

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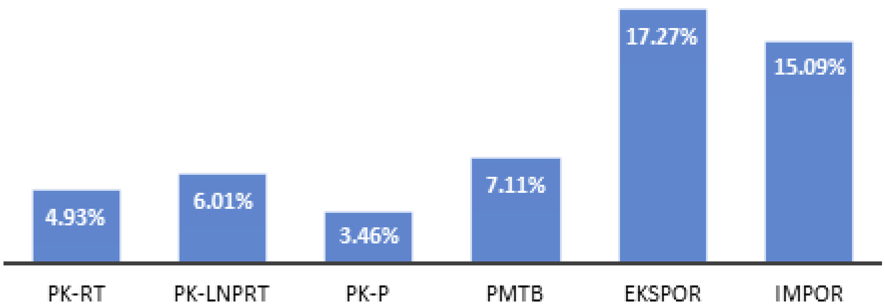
the third quarter of 2017, the Indonesian economy based on GDP at current prices reached IDR 3,502.3 trillion and at constant prices in 2010 reached IDR 2,551.5 trillion (BPS, 2017).

Indonesia's economy in the third quarter of 2017 compared to the third quarter of 2016 (y-on-y) grew 5.06 percent. Growth occurred in all components where the highest growth was achieved by the component of exports of goods and services of 17.27 percent, followed by the Gross Fixed Capital Formation (PMTB) component of 7.11 percent, the Consumption Expenditure Component of Non-Profit Institutions Serving Households (PK). -LNPRT) of 6.01 percent, the Household Consumption Expenditure Component (PK-RT) of 4.93 percent, and the Government Consumption Expenditure Component (PK-P) of 3.46 percent (BPS, 2017).

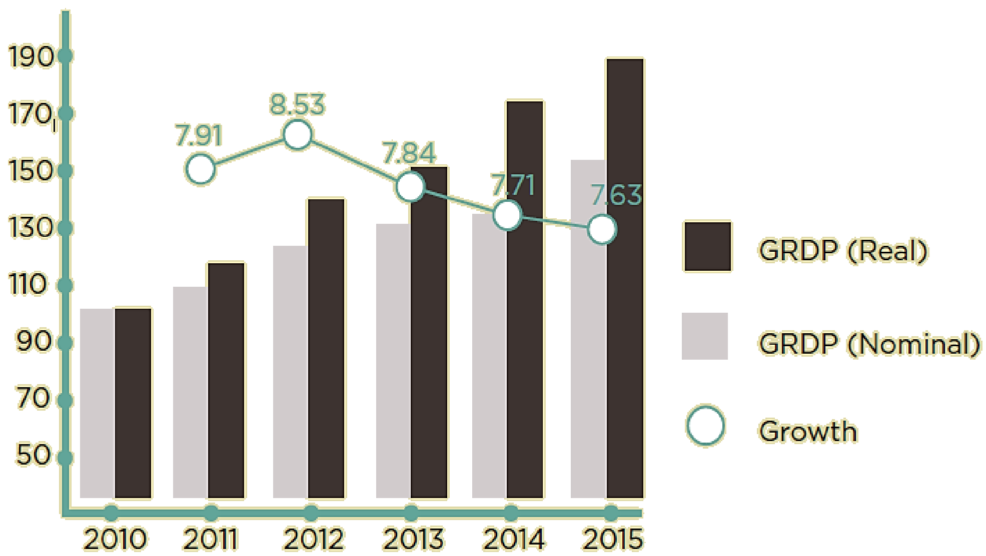
Figure 1. Growth of Expenditure GDP Components in Quarter III-2017



Source: Central Bureau of Statistics, 2017

Then with economic growth of 7.79% in 2017, Bandung is the city with the highest economic growth in West Java, this economic growth is also above the national economic growth which is at 5%.

Figure 2. Gross Regional Domestic Products (GRDP) Real 2015



Source: DPMPTSP Bandung City, 2017

Likewise with industrial growth in the city of Bandung, according to the BPS of Bandung City (2017), the city of Bandung has industrial potential, both large, medium, small and micro scale industries. From data from the Bandung City SME Cooperative Service in 2015 in Bandung City there were 10 large industries and 825 medium industrial units. Table 1 describes the potential of the industrial sector in Bandung City in 2015.

Table 1. Potential of Industrial Sector in Bandung City in 2015

No.	Criteria	Business unit	Labor
1	Big Industry	10	857
2	Medium Industry	825	23,321
3	Formal Small Industry	2,770	43,692
4	Non-Formal Small Industry	12,279	43,326

Source: SME Cooperative Office, 2015

Furthermore, in the MSME sector, the City of Bandung continues to show developments every year so that it becomes a sector that improves the economy. As depicted in Table 2.

Table 2. Number of MSMEs in Bandung City in 2010-2015

No.	Type of business	Year					
		2010	2011	2012	2013	2014	2015
1	Micro	3,649	3,827	3,921	4,115	4,301	4,527
2	Small	301	325	337	357	327	390
3	Intermediate	271	273	273	274	276	281
Total		**4221**	**4425**	**4531**	**4746**	**4904**	**5198**

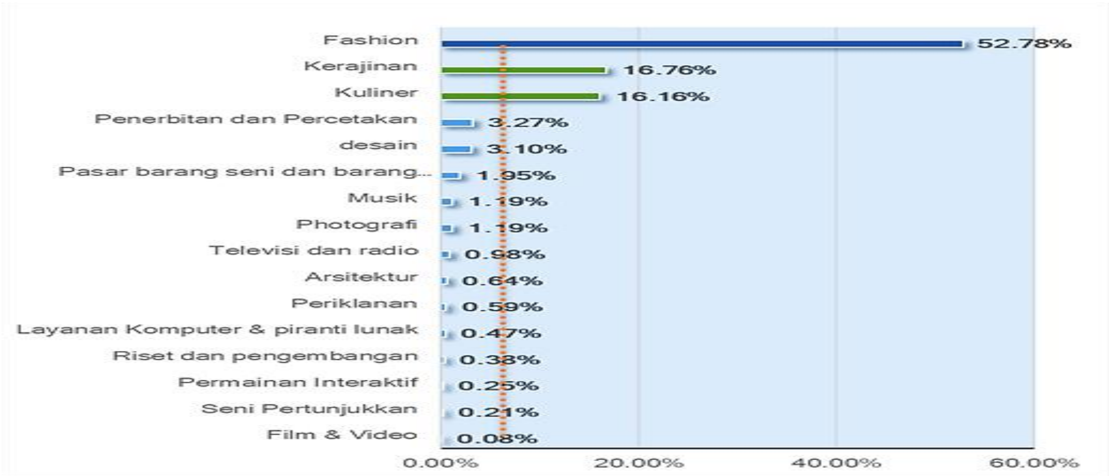
Source: SME Cooperative Office, 2015

This high growth shows that the city of Bandung is one of the cities with increasing MSME economic growth. Along with the increasing growth of MSMEs, there is an impetus to increase competitiveness through technological support. But on the other hand, technology demands a fundamental change in behavior patterns. Currently an employee is able to do his job by monitoring or monitoring from a computer, remotely. A programmer or writer does not even have an office to work everyday because they can work anywhere with technological devices, such as laptops, computers, and software that supports them.

Of course, this change will encourage people to build their own companies. So, start-ups become a business solution that can be worked on (Darmansyah, 2015). The development of startups in Indonesia is very fast. According to techno okezone, at least now there are 2500 local startups in Indonesia and Bandung which are known as creative cities, which have the potential to become areas that will be filled with the rapid growth of start-ups. (Darmansyah, 2015).

Along with economic growth in the industrial sector, MSMEs, and start-ups, the creative economy is currently developing in Indonesia. Creative economy was introduced by the Ministry of Trade, Ministry of Industry, and Ministry of Tourism through the Indonesia Design Power 2006-2010 program. Currently, the government has identified 16 sub-sectors in the creative industries, namely fashion, crafts, culinary, publishing and printing, design, art and antiques markets, music, photography, television and radio, architecture, advertising, computer services and software, research and development, interactive games, performing arts, film and video.

Figure 3. Number of business actors in the Creative Industry sector in Bandung City 2016



Source: Research Results, 2017

The number of business actors who took part in the creative industry survey in the city of Bandung were as many as 2357 people. The fashion sub-sector appears dominant with a total of 1244 people and a percentage of 52.78%. Fashion is a creative activity that involves a high level of imagination. Furthermore, the craft sector is in second place after the fashion sub sector. Based on the survey calculations, there were 395 handicraft business actors with a percentage rate of 16.76%. In third place is the culinary sub-sector with the number of culinary business actors recorded as many as 381 people with a percentage rate of 16.16%.

These three sectors increase the attractiveness of the city of Bandung for other business actors outside the city of Bandung, or even business actors in the city of Bandung itself. Especially for investors or investors. This is reasonable considering that the products from the three sub-sectors are the favorite targets of tourists visiting the city of Bandung. If the three sub-sectors above are added together (fashion, crafts, and culinary), it turns out that they are able to contribute a total of 85.70% of business actors from all sectors of the creative economy in Bandung.

Based on the data that has been shown above, Bandung City is an important city for economic activity in West Java and nationally as a growth center with a focus on the movement of economic growth in various sectors. However, there are several things that become problems that are often not carefully planned, such as;

a. The absence of accurate and detailed data regarding the overall economic picture covering industry, MSMEs, the Creative Economy and new businesses/businesses that are growing both in the field of technology (start-up) and non-technology.

b. The description in point a, is a reference for the preparation of business matching plans in the city of Bandung, and is the initial and basic data in determining the business matching planning in the city of Bandung.

The preparation of business matching models or plans for the City of Bandung is a manifestation of the vision of the City of Bandung, namely the realization of a superior, comfortable, and prosperous Bandung City. Prosperity for the people of Bandung City, including for business actors in the City of Bandung through strategic steps, one of which is business collaboration or what is known as business matching.

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Business matching and adequate supply of information related to business needs such as the need for raw materials, business partners, and the like, which facilitates the building of linkages between businesses that are increasingly needed in the era of global trade. Because the market has developed in a wider scope and also because of the limitations of the supply chain network which leads to market uncertainty, which is often referred to as a short supply chain. (Yeow, 2000).

The main purpose of business matching activities is to create business relationships between two or more parties, in order to build sustainable business strength and the life span of the company/business to be able to survive longer. The form of business matching can be in the form of an expo or a trade show. Expos are held so that companies from certain industries can showcase and demonstrate their products and services, and businesses are able to learn about competitors' activities and follow trends to find new opportunities (Aditya, 2014).

A number of trade fairs or expos that have been held in Bandung are usually open to the public, while others can only be attended by company representatives (members of the business community or business actors, or related MSME players, or creative economy players as well as company and industry owners). business actors such as creative economy players and MSMEs and are also usually attended by members of the press/journalists, so that trade fairs are grouped as general or trade only. Through the trade exhibition (expo) which is a manifestation of the business matching expo, the hope is that business actors have sensitivity to market tastes which are strongly influenced by lifestyle, economy, social and culture. (Eva, 2017).

2. LITERATURE REVIEW

2.1 Matching Concept

According to Moghaddam and Nof (2017) in their book Best Matching Theory & Applications, "Matching is an intrinsic process in any natural or artificial system that involves interaction, best matching is finding the best match and doing so in the best way is often associated with survival. The artificial system also deals with similar, industrial and business matching processes-matching bolts and nuts (selective assembly), suppliers, distributors, retailers and customers (enterprise network selective design), jobs and machines/computers (scheduling), etc".

Matching is the process of adjustment or matching. Business matching is a business collaboration with other businesses, including collaboration between suppliers, distributors, retailers, and customers. Through this collaboration, a business can establish linkages and dependencies with one another in the context of business development and have sustainable competitiveness. Matching (adj) is conformity according to complementary patterns, colors or designs. Matching (Ver) causes to relate in some important way, which will make the relationship harmonious in quality or strength. According to LJ Cox et al (2009), the best matches occur when the goals of the business/business/community actors are in accordance with the benefits provided by other businesses that establish business relationships.

2.2 Business Matching

Business matching is the process of matching or adjusting ideas, concepts, vision and mission, as well as business models according to values, culture and economic climate. Business concept adjustments are made between similar businesses and have the same goal. Business matching and adjustment in the business matching concept usually brings together entrepreneurs in a sharing discussion activity from entrepreneurs and start-ups with efforts to improve sustainable competitiveness (Moghaddam and Nof, 2017).

The development of new businesses requires a strategy to survive (survive) and good management. For novice entrepreneurs, it is necessary to explore more deeply what can be used to make a product or service better and of higher quality. In the business world, business matching is a strategy whose goal is to collaborate with several similar businesses in one community. This business matching is commonly done, so that a business is more advanced and has sustainable endurance.

Business collaboration can be very beneficial for business actors, for example businesses with online core businesses, collaborating with MSMEs with quality, unique and distinctive local products that have wider business opportunities through online marketing. In an area that has advanced with the use of digital technology, the government's official website of course has listed MSMEs with various types of businesses. Based on the MSME database, there will be many benefits from business matching collaboration. One of the benefits obtained from business actors with the matching concept is that MSMEs can reach a wider market. This is a business strategy that can make MSMEs able to compete.

2.3 Scope of Business Matching

Business matching includes meeting activities of business actors through fair trade/fair shows or fair expos. Fair trade (trade exhibition) is organized by relevant government/non-government agencies with the aim of establishing a business network capable of strengthening business-to-business relationships. Business matching brings together entrepreneurs, company leaders, MSME players, start-ups that are just growing, as well as financiers of capital either from the Government (public equity), banks or from the private sector (private equity). Business matching participants are delegates from agencies or companies from other countries. Through fair trade, it is expected to be able to create sustainable competitiveness, and increase macroeconomic growth which has an impact on people's welfare (Yeow, 2000).

The government and non-government such as the Chamber of Commerce and Industry (KADIN) usually only provide services as a forum for organizing expo activities. So as to facilitate the two parties of business actors to cooperate, if there is a cooperative relationship, the activity is called matching in establishing business engagements.

To play the role of the introducer as a trade facilitator, such as the Bandung City SME Cooperative Service and the Bandung City One Stop Integrated Service and Investment Service (DPMPTSP), one must be able to understand the scope of business relationships. Business relationships are a form of effort to connect stakeholders in a business meeting. At the business meeting, which should have been scheduled, will bring together and connect the business agents; Distributor; Supplier partnerships; Joint Marketing; Licensing; Contract Manufacturing; Original Equipment Manufacturer (OEM); private labels; Franchise; Joint research and development; Equity participation or investors; Joint ventures; Mergers and acquisitions (Yeow, 2000, p.5).

It should be underlined that this meeting is B2B in nature and takes place between two parties with industrial backgrounds business which match / the same. Usually, delegates will come in group formations to look for potential buyer(s) that match their business targets (Binar, 2017).

2.4 General Business Matching Procedure

According to Yeow (2000), there are several levels of business matching. Figure 4 provides a graphical representation of the business matching relationship to the needs of the required resource roles. Resources in this context are related agencies which are the facilitators for organizing the business matching program. In this study, the Department of Investment and Service One Stop Terpadu (DPMPTSP) of Bandung City, Bandung City Chamber of Commerce

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and Industry, as well as the Department of Industry and Trade, have an important role as organizers of trade fairs (fair trade), or trade expos as a form of business matching.

In Figure 4, Information services on trade and business opportunities are a form of service provided in the form of information on trade and business opportunities for business actors. At this level, the organizers of the business matching program are usually able to provide and implement it.

Joint ventures, business collaborations, merger sand acquisitions require a high level of legal, financial and technical expertise. At this level joint ventures, business collaborations, mergers and acquisitions are outside the scope of the role of the relevant agencies as organizers of the business matching program.

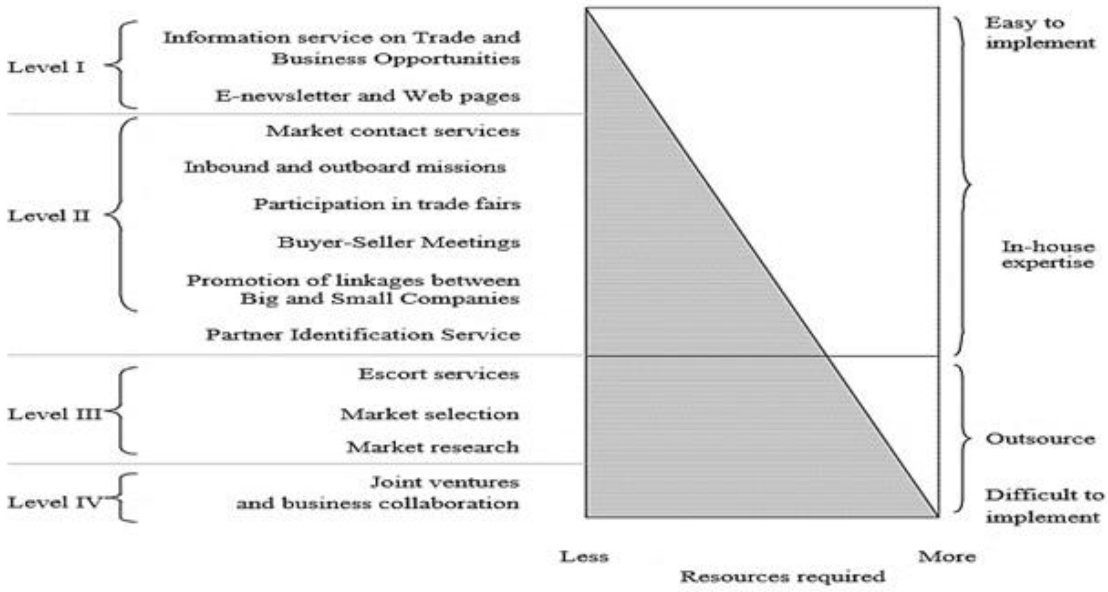

Figure 4. Types of Business Matching Programs with Required Resources

Source: (Yeow, 2000)

3. METHODOLOGY

3.1 Research location and time

This research was conducted in the city of Bandung, West Java. The work on the preparation of the business matching plan is planned to be completed within 90 (ninety) calendar days.

3.2 Method of collecting data

This research method uses a qualitative approach, namely research that can be interpreted as: study which does not count. The purpose of research with a qualitative approach is to gain understanding, develop concepts or theories, and describe complexly the object under study (Amirudin and Asikin, 2006; Hasan, 2012). Data collection techniques using the method of documentation. Documentation is a method of collecting and recording data on files or documents related to the object of research being discussed (Soekanto, 1986).

Supporting data and information related to business matching are needed to compile this study, especially in the form of secondary data published by the Central Statistics Agency (BPS), as an agency or agency that has the authority and credibility in presenting data and information needed in Indonesia. Most of the secondary data refers to BPS. Then the data and information sourced from the Office of Investment and One Stop Integrated Services (DPMPTSP) Bandung City, and Bandung City SME Cooperative Service, and Bandung City Central Statistics Agency.

Then data and information about business matching were obtained from literature studies sourced from online electronic library databases, e-books, trusted online journal databases, scientific open access journals, books to the results of conference proceedings. (Soekanto, 1986). Database sources include; Google Scholar, Scopus, Emerald Insight, Proquest, Elsevier, Science Direct, EBSCO host, Springer, Indonesian Library, and Garuda portal.

Search literature referring to Petersen et. al., (2009) and Kitchenham (2007), database searches using keywords;

"Business Matching" AND Trade

The literature search was carried out on the database mentioned above, and the search results from some of the literature that had been researched were selected manually according to the study being studied, so that the data obtained could be relevant to this study. Table 3 shows the results of the literature execution from the electronic database search:

Table 3. Results of literature searches on Business Matching

No	Databases	Search Date	Search String	Doc. Type	Detected	Inclusion	Exclusion	Percentage
1	Scopus	November 2017	("Business Matching" AND Trade)	Journal	3	1	2	33.33%
2	ProQuest Research Library	November 2017	("Business Matching" AND Trade)	Journal	6	1	5	17%
3	Science Direct	November 2017	("Business Matching" AND Trade)	Journal	24	4	20	16.67%
4	Springer	November 2017	("Business Matching" AND Trade)	Journal	2		2	0.00%
5	Emerald Insight	November 2017	("Business Matching" AND Trade)	Journal	4			0.00%
Total Search					**39**	**6**	**29**	**15.38%**

Source: Research Results (2017)

3.3 Data analysis method

In a qualitative approach, the data analysis method uses a deductive method, namely the method used in the discussion, departing from general knowledge and then to assessing an event that is specific. (Hadi, 1989). General knowledge in this research refers to literature review on business matching, fair trade, fair show/expo and related to investment and capital. Thus, after departing from general concepts that have been generalized, they are then interpreted with existing theories and reference sources. So, the end result is strategic business matching models to bring in investments that can be implemented in the city of Bandung.

4. RESEARCH RESULT

4.1 Population Growth Rate in Bandung

Table 4. Population and Population Growth Rate of Bandung City

Year	Total population	Population Growth Rate per Year
2011	2,429,176	0.71

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2012	2,444,617	0.64
2013	2,458,503	0.57
2014	2,470,802	0.50
2015	2,481,469	0.43
2016	2,490,622	0.37

Source: Research Results (2017)

Overview of Investment in Small, Medium and Large Industries in West Java in 2009-2012

Table 5. Number of Small Medium and Large Industrial Units in West Java

District/ City	Business unit	Labor	Investment	Business unit	Labor	Investment
	2009			2010		
Bandung	12,269	123.812	450,671.15	13,473	188,855	1,111,471,29
Sumedang	5,030	103.540	42,408,90	5,130	159,477	57,508.9
West Bandung	16	480	14,980,00	17	1,680	69.980
Bandung	10,701	72.431	69,253,40	10,820	121.120	147,980.4
Cimahi City	6,028	109,267	31,573.95	6,097	187,215	599,124,66
West Java	**198,478**	**2,280,375**	**6,040,433,20**	**203,060**	**4,216,671**	**130,681,582.73**

Source: Research Results (2017)

Table 6. Number of Small Medium and Large Industrial Units in West Java (continued)

District/ City	Business unit	Labor	Investment	Busines s unit	Labor	Investment
	2011			2012		
Bandung	13,483	189,850	1,121,566.29	13,483	189,850	1,121,566.29
Sumedang	5,130	159,477	4,960,586,9	5,130	159,477	4,960,586,90
West Bandung	52	2,251	5,764,877,6	52	2,251	5,764,877,60
Bandung	10,820	121.120	8,560,783.48	10,821	121.120	8,560,783.48
Cimahi City	6,112	187,215	3,068,699.06	6,112	187,215	3,068,699.06
West Java	**203,312**	**4,221,285**	**212,529,635.83**	**203,419**	**4,221,393**	**213,076,638,83**

Source: Research Results (2017)

4.2 Data on Export Realization of Main Commodities in Bandung City 2016

Table 7. Realization of Main Commodity Exports in Bandung City 2016

Commodity Type	Volume	Score
Electronic devices	-	-
Medical devices	6,047,293,20	11,115,811.87
Household appliance	-	-
Musical instrument	-	-
Laboratory Equipment	-	-
Furniture	194,492,10	3,220,246,77
Gondorukem / Turpentine	-	-
Rubber / Rubber Products	3,079,776,30	4,014,718,77
Leather / Leather Products	-	-
Marble / Ceramic	1,484,531,20	5,765,848,32
Rug / Carpet	148,333,759,72	20,295,301.81

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Commodity Type	Volume	Score
Drugs	1,857,581.09	14,946,826,50
Textiles / Textile Products	52,056,637.58	238,650,294,15
Tea		-
Apparel	88,948,255,78	200,806,592.33
Thread	30,382,571.63	58,486,839,80
Tricycle	186,978,60	5,593,068,89

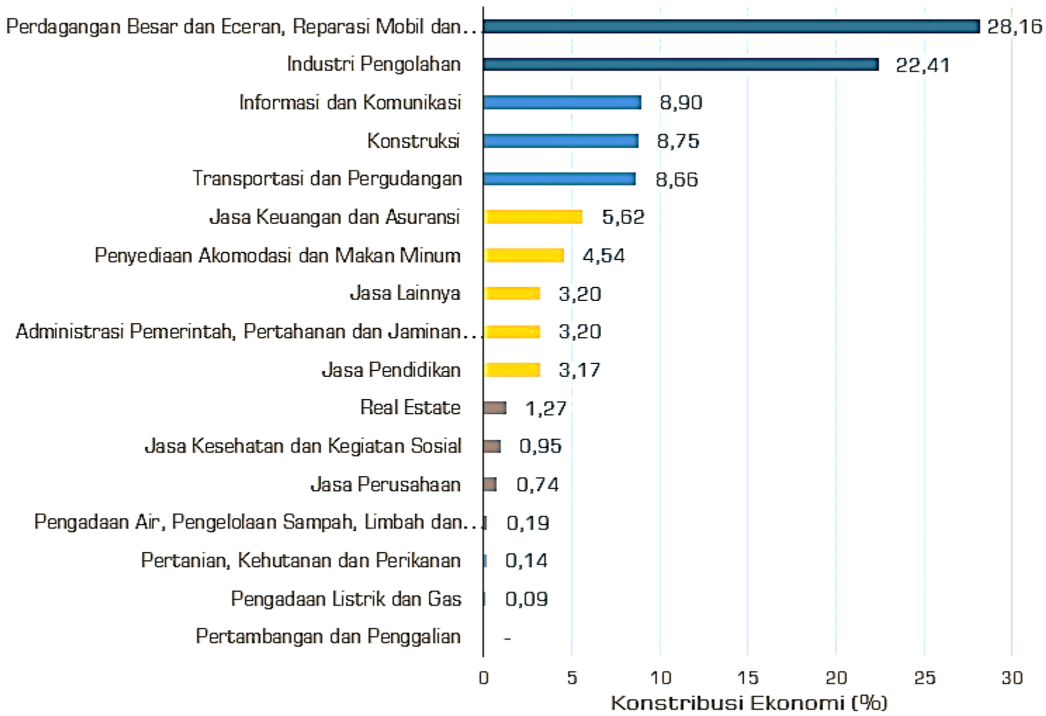
Source: Research Results, 2016

5. DISCUSSION

5.1 Overview of Investment in Bandung

The city of Bandung contributes to national economic growth. Sector role economy of the city of Bandung, is described by its contribution to the economy of West Java. As an urban area, the economic structure of Bandung City is dominated by the service sector. The complete economic structure of Bandung City in 2010-2016 can be seen as follows.

Figure 5. Economic Structure of Bandung City in 2010-2016



Source: Research Results, 2017

The Wholesale and Retail Trade, Car and Motorcycle Repairs sector became the most dominant sector in the City of Bandung, between 2010-2016, with an average contribution of 28.16%. The sector that gave the second largest contribution was the Manufacturing Sector which contributed 22.41%. These two sectors constitute half of the economic activity in the city of Bandung. The Information - Communications Sector, the Construction Sector and the Transport - Trade Sector, contributed together about 26%. The five sectors already cover about 76% of economic activity in the city of Bandung. An interesting economic structure in Bandung City is that among the various service sectors that dominate, there is still the Manufacturing Industry Sector as a real sector that still survives in the City of Bandung.

Through the economic structure in the city of Bandung which has such great potential for investors, business actors and the like, both from abroad and from within the country, investors should prioritize the city of Bandung as their target market. To support the realization of investment strategy activities in the city of Bandung, it can be realized through a face-to-face method, namely the business matching model.

5.2 The strategic role of Business Matching

Business matching is a program strategic to achieve sustainable competitiveness. We formulate 3 reasons why we have to go through business matching;

1. To expand the business network (networking). There are quite a number of domestic entrepreneurs who have difficulty getting the opportunity to expand their business due to limited acquaintances and experience.
2. To streamline time and costs. At trade shows (expo) business actors are able to save time and money in establishing business partnerships. Business actors can visit potential partners from various foreign business models, countries, and industries in just a few hours and without spending so much money. So far, the obstacle for business actors is the lack of information due to the wide scope of business globally.
3. To increase knowledge about business and trade trends that exist in the world globally. Because all business actors who are at the business matching exhibition (expo) display their products with various kinds of innovations and creative new ideas. So, this is an opportunity for other business actors to innovate through business matching as a comparative means.

5.3 Business Matching Models

There are many business matching exhibition activities held in Indonesia. Like the Chamber of Commerce and IndustryIndonesia (KADIN), IBDexpo Indonesia, Trade Expo Indonesia (TEI), Fortune PR, Business Matching-Megbuild Expo, Indonesia Maritime Expo, PT Omni eComm Expo-Cvent. The government also plays a role as organizer of business matching expos such as the Ministry of Trade, the Indonesian Ministry of Foreign Affairs, the Ministry of Cooperatives and SMEs, for the City of Bandung through the Bandung City Investment and One Stop Integrated Service (DPMPTsP) and the Bandung City SME Cooperatives Service.

Agency the government or related private parties such as Kadin, consulting companies that handle the implementation of business matching programs are expected to be able to bring together delegates and potential buyers from Bandung City. The challenge that is often faced is the ignorance of Indonesian entrepreneurs regarding business models such as business matching so that the consultant's high persuasive ability and willingness to direct socialization to the "market" is needed. In addition, good relations with associations will be very helpful to attract more potential buyers (Binar, 2017).

The business matching organizer aims to assist Industries, MSMEs, and creative economy business actors in forging strategic business partnerships and networks with large companies to spur the development of industries, MSMEs, and creative economy business actors which will ultimately contribute to the country's wealth.

The model used in the implementation of business matching is as follows:

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Figure 6. Business Matching Model

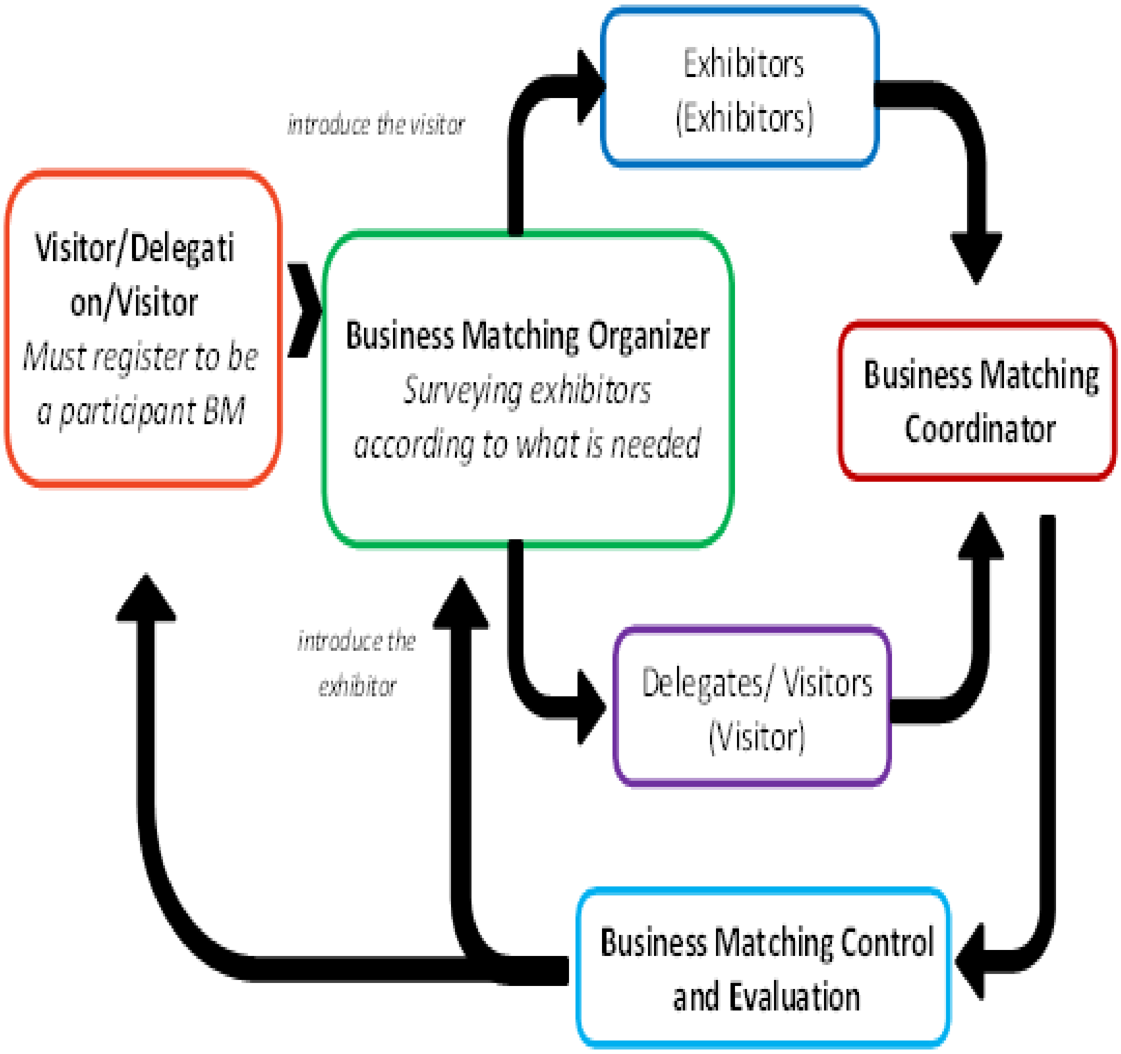
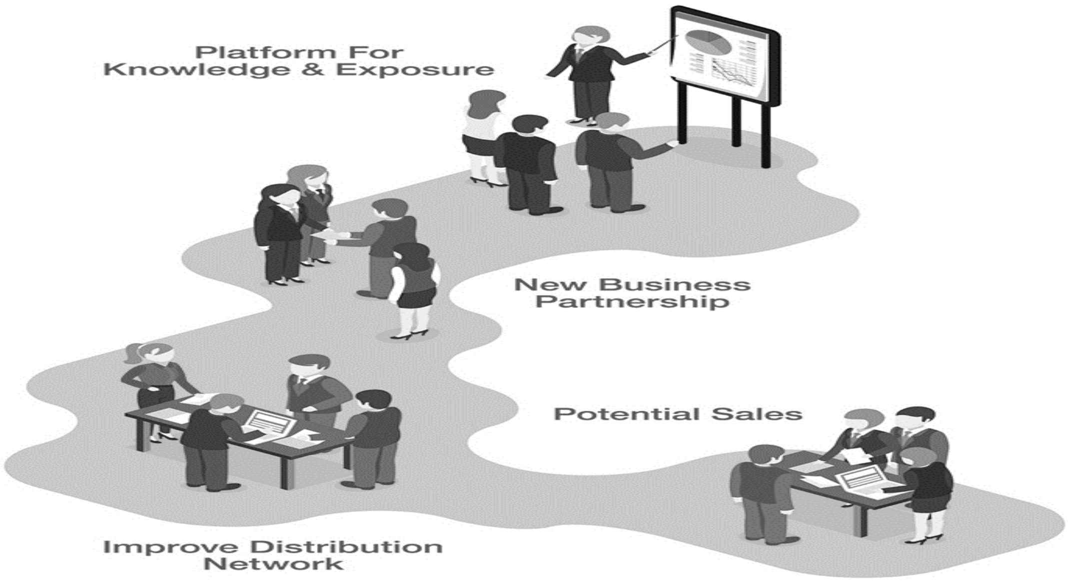


Figure 6 is a business matching model carried out by the Business Matching Planning Team of the One Stop Integrated Licensing and Investment Office (DPMPTSP) of the Bandung City Government. The business matching model seeks to match delegates (visitors) with exhibitors (exhibitors) who have what visitors need. In the end, the visitor meets the exhibitors who produce a match, so it is called matching.

As the organizers design a model to be applied to the business matching program, it is in line with the aims and objectives of the expo activity itself. At The 20th SME Annual Showcase & Conference 2017 (SMIDEX) exhibition organized by the collaboration between the Government of Malaysia and SMEcorp Malaysia on 15-17 November 2017. In a business matching trade exhibition (expo) that facilitates industries, SMEs, large companies even multinational companies to showcase and offer the latest products, services and technologies for the global market (SMIDEX, 2017) .

Figure 7. Business Matching Session on SMIDEX



Source: SME Corporation Malaysia (SME Corp. Malaysia), 2017

First, the organizers did the opening by providing useful information for the delegates or exhibitors. Furthermore, in business matching activities, there was a face-to-face meeting between two business actors. Finally, they form a new business partnership if the two match. Then after a business partnership is established, the investors/agents/larger business actors will improvise more by discussing technical business in detail that will involve many distribution networks. This is called direct discussion with business partners (suppliers, distributors, customers, etc.) before making a decision at a one-to-one meeting. After the series of models above, the last is the final transaction such as the signing of an MoU or work contract.

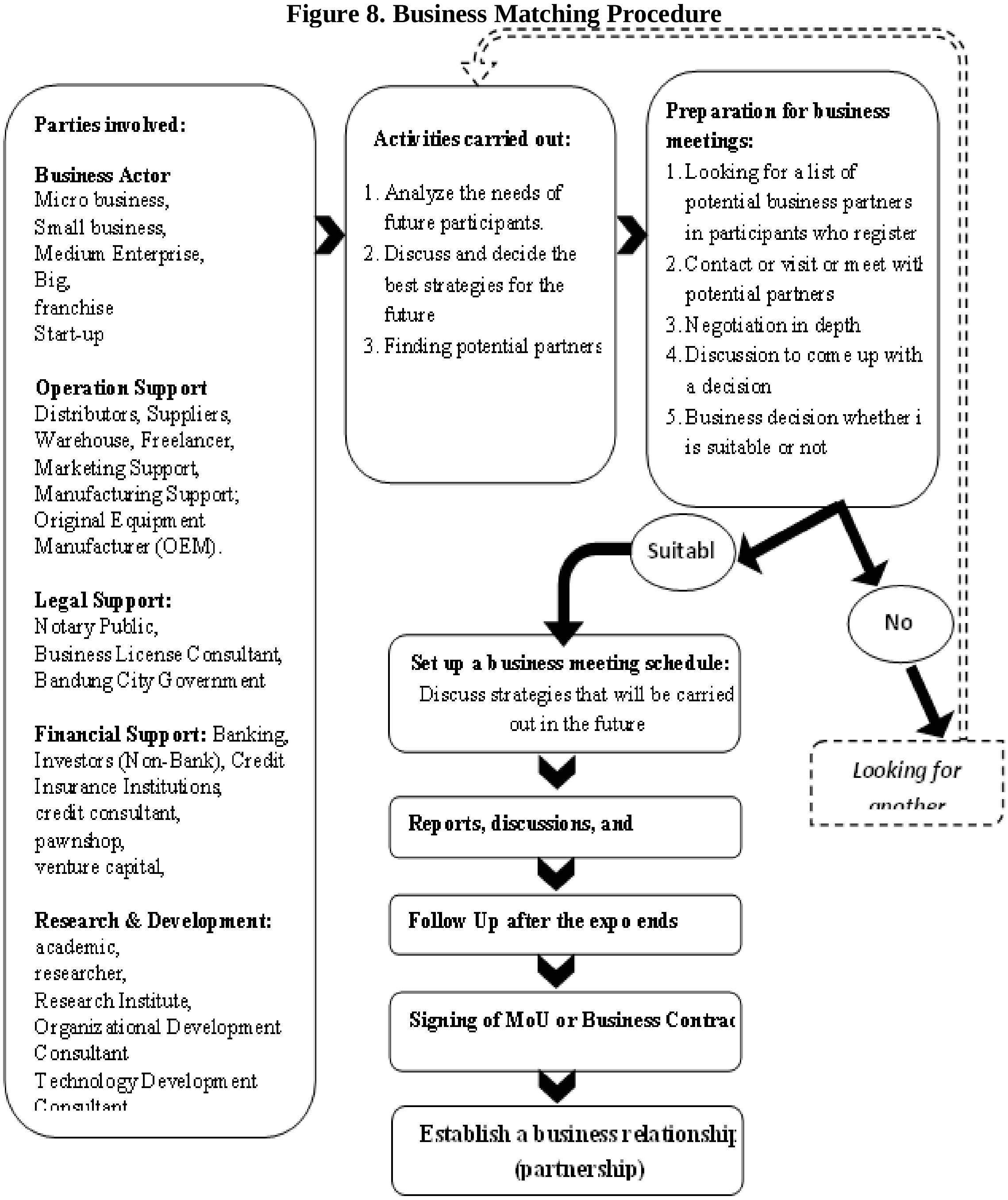
The series of business matching session activities above, provide a new perspective on how business matching sessions are conducted and run. Investors will be more interested if the business matching session is carried out as interactively as possible, as clearly and in detail as possible by displaying strategic data related to industries, MSMEs, and the creative economy in the area where the business matching exhibition is being held.

5.4 Business Matching Procedure

In general, the procedure for a formal business meeting usually begins with an introduction session or the process of exchanging business cards (personal business information) and continues with a product explanation, followed by a discussion to produce business decisions. According to Binar (2017) in order to be conducive and efficient, normally each meeting will be limited to 10 to 20 minutes in a private setting. The total number of business delegates attending from abroad is usually 7 to 10 delegates. Simultaneously, delegates from abroad hope to find partners who can market their products in Indonesia. If the discussion goes well, there will be a business partnership agreement through the signing of a Memorandum of Understanding (MOU) directly by both parties.

Through the role of the organizing institution, in particular, there are several business matching procedure stages. This point refers to Ho (2017) which was released on the old Exporthelp Asia. The stages of business matching are described in a graphic scheme which include:

Figure 8. Business Matching Procedure



Source: Yeow, 2000; Ho, 2017

The scheme above is a procedure that explains the stages of business matching activities at a trade show (expo) held by both the government and the private sector. It is emphasized that every activity that occurs in business matching must be documented and archived, because the information data on cooperation activities that occur affect growth economy in a region. In the city of Bandung, by looking at the rate of economic growth, it is very potential to formulate agendas for planning business matching activities.

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5.5 Business Matching Framework

No.	BUSINESS MATCHING PLAYERS	CONTRIBUTE TO BUSINESS MATCHING	SUCCESS TARGETS
1	Micro, Small, Medium, Large, Franchise, Start-up	Product offerings in the form of goods and services that will be developed and have the potential for collaboration, New product ideas or new product innovation ideas that have the potential for collaboration.	The number of variants of goods and services offered in business matching, Number of ideas.
2	Distributor	Product distribution network offerings, Capacity offer.	The number of MSMEs, large, franchises, and start-ups collaborating in distribution, Development of product distribution range, Increased product variants distributed, Increased distribution capacity.
3	Supplier	Supply quantity supply of product raw materials, Offering variants of supply of raw materials for products.	Fulfilling the need for quality raw material supply, Fulfill the quantity of product raw material supply needs.
4	Warehouse	Store goods for production or production results in a certain amount and time span, distribute to the intended location on request.	The quantity of goods distributed is met.
5	Freelancer	Cooperation offers in the form of a freelance work bond that is not bound by time.	Able to meet the deadlines of the work given by the client.
6	Marketing Support	Support and provide marketing services for goods and services to business actors.	Increasing the number of sales of goods and services, marketing to the right target market.
7	Manufacturing Support, Original Equipment Manufacturer (OEM)	Increase added value to a product and provide value to customers on an ongoing basis.	Increased product capacity, Improved quality of manufactured products, increased product variants Product innovation.
8	Notary Public, Business License Consultant,	As a provider of legal support for licensing and offering legal documents for a business.	Increasing the number of companies that take care of licensing, Increasing the number of products that meet national/international standards.
9	City government	As the executor of Business Matching activities, Provide licensing services.	An increase in the number of micro, small, and medium enterprises that are licensed.
10	Banking, Investors (Non-	Provide capital support in the form of;	An increase in the number of companies provided with capital

	Bank),Credit Insurance Institute, pawnshop	share, business credit/capital, etc	support, Increase in the number of loans disbursed.
11	Credit Consultant	help design the loan process, such as the required data, to the stage of disbursement of funds from several banks.	Increasing the number of businesses supported, Improved business performance to become bankable, achievement of credit loan targets.
12	Venture Capital	help access business development in the form of Venture Investors.	Increased investment in the form of financing in the form of equity participation in a private company as a business partner (investee company) for a certain period of time. Increase in the number of business partners
13	Academics, Researchers, Research Institute, Organizational Development Consultant, Technology Development Consultant	designing product innovations in research studies, offering better organizational and management development tailored to the needs of business actors. offers strategic innovation in the field of technology and information to support competitiveness.	An increase in the number of ideas and concepts or ideas, training of human resources or business actors in the context of increasing competitive ability, Increasing number of innovative products, Improving the quality of innovative products, Improvement of information technology applications in companies, An increasing number of companies are leveraging technology.

Source: Research Results (2017)

6. CONCLUSION

a. The dominant economic sectors in the city of Bandung are the wholesale and retail trade and manufacturing industries. The processing industry that was built in the past is getting less and less competitive. The trade sector tends to be flexible, following population growth and urban characteristics.

b. Structure economyin the city of Bandung which has enormous potential for business development and enables companies to compete in global and sustainable competition, for: Micro, Small, Medium, Large Enterprises, Franchise, Start-Up Distributors, Suppliers, Warehouses, Freelancers, Marketing Support, Manufacturing Support; Original Equipment Manufacturer (OEM), Notary, Business License Consultant, Government, Banking, Investor (Non-Bank), Credit Insurance Institution, Credit Colsultant, Pawnshop, Venture Capital, Academic, Researcher, Research Institute, Organization Development Consultant, Technology Development Consultant , either from abroad or from within the country.

c. To support the realization of investment activities in the city of Bandung, can be realized through Business Matching, which is a direct face-to-face method. Through the face-to-face method, it will accelerate business decision making through in-depth discussions. In the end, a business matching will produce an output in the form of an MoU or a business contract. Furthermore, it will form a collaboration in the form of business collaboration

REFERENCES

- Aditya, D. (2014). The Role of the Trade Exhibition and the Marketing Performance of the Wood Furniture Industry Center in Kalijambe District. eprints.ums.ac.id.
- Binar, Q. (2017). Targeting Business Opportunities Through Business Matching Meetings. Indonesian: theprtalk.com.
- BPS. (2017). Indonesia's Economic Growth Quarter III-2017, No. 101/11/Th. XX, 6 November 2017. Jakarta: The Central Bureau of Statistics of the Republic of Indonesia.
- Darmansyah, R. (2015). Bandung Technology Park. Bandung: Indonesian University of Education | repository.upi.edu | library.upi.edu.
- Eva. (2017, 11 14). Want to Target the International Market? Watch This! Retrieved from SWA Online: https://swa.co.id/swa/trends/management/mau-sasar-pasar-internasional-harga-hal-ini
- Hadi, DK (2009). Impact of the Global Financial Crisis for Indonesia. Jakarta: Chief Economist Assistant PT Recapital Advisors.
- Hadi, S. (1989). Research Method II. Jogjakarta: Andi Offset, cet. XIX.
- Ho, T. (2017, 11 15). Business matching service. Retrieved from EXPORTHELP ASIA: https://exporthelp.asia/en/business-services/for-foreign-company/business-matching
- Indonesia, B. (2017, September 5). Real Sector Development Program and MSMEs Through Cluster Patterns. Retrieved from Bank Indonesia: http://www.bi.go.id/id/umkm/klaster/pengembangan/Contents/Default.aspx
- Kurniadi, 2020. Community Business Matching Model: An Innovative Approach to Public Private Partnership Development. Depublish publisher. Yogyakarta
- PackAfrica. (2017, 11 15). Business Matching Program (BMP). Retrieved from PackAfrica. Org: http://www.packafrica.org/business-matching-program-bmp
- SMIDEX. (2017, 11 15). Business Matching Sessions. Retrieved from SME Corporation Malaysia (SME Corp. Malaysia) SMIDEX 2017: http://www.smidex.my/node/4
- Soekanto, S. (1986). Introduction to Legal Research. Jakarta: UI Press.
- Yeow, WC (2000). Setting Up a Business Matching Service Within a Chamber or Trade Association. ZDH Partnership Program, 1-58.

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WORK LIFE INTEGRATION OF IT EMPLOYEES DURING COVID PANDEMIC - AN EMPIRICAL ANALYSIS

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ABSTRACT
Organizations are expected to provide support especially, at the time of crisis to maintain the mental health of employees. During the COVID-19 Pandemic lockdown, most of the organizations made an overnight shift to online working or working from home. Some organizations were not ready for this change and some others did not plan for the contingencies with appropriate technical support. The study which has been conducted among 150 IT Employees narrowing the research on the Work Life Integration of IT Employees during Covid Pandemic - An Empirical Analysis. The researcher has taken three aspects such as Work Emotions, Stress due to COVID 19 and Employee Engagement and interrelated the statements with the help of correlation analysis. The study depicts that emotionally the sample respondents are satisfied with the work they handle and work emotions have not bothered the IT employees towards the work. It is concluded that irrespective of the work emotions and stress due to COVID 19, the IT employees were readily engaged in work by overcoming the hurdles.

Keywords: COVID 19, Emotions, IT Employees, Stress, Work Engagement

INTRODUCTION
Organizations are expected to provide support especially, at the time of crisis to maintain the mental health of employees. During the COVID-19 Pandemic lockdown, most of the organizations made an overnight shift to online working or working from home. Some organizations were not ready for this change and some others did not plan for the contingencies with appropriate technical support. Though stressful situations often arise in life and people deal with it in different ways. With COVID-19, everyone was facing the challenge of preventing oneself and their families from this deadly virus. Under stress, people usually kept thinking about the same thing over and over again. Past studies suggest that crisis affects individual work and psychological wellbeing to a large extent (Wright &Hobfull, 2004; Griffin & Clarke, 2011; Bakker &Demerouti, 2018 ;). Crisis can be defined as an emotionally stressful and disturbing event in person's life (Ünal-Karagüven, 2009). The outbreak of COVID-19 in the current time has led to a crisis situation and made a major switch in the regular working conditions worldwide correlated with high public uncertainty (Kanupriya, 2020). In addition to the stress associated with Covid-19 disease, media speculation has caused this psychological disturbance more severe. The current situation with lockdown and work from home (WFH) has become stressful for many of us. Past studies have found that high work load with unrealistic deadlines, work-family imbalance and job insecurity were the main stressors for employees (Krantz et al., 2005; Sullivan &Mainiero, 2008; Sahni, 2016). Work from home was once considered an effective strategy for providing more flexibility to employees (Greenhaus et al., 2003) and known for enhancing the work like balance, organizational commitment and overall job satisfaction (Manochehri& Pinkerton, 2003; Felstead&Henseke, 2017; Sahni, 2019), however, it is creating work life imbalance due to indefinite working hours and blurred boundaries between office work and personal life. The present study aimed to probe the interrelationship among

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work emotions, work engagement and stress due to covid among 150 IT employees in the major cities of Tamilnadu such as Coimbatore, Tirichy and Chennai.

Work Emotions

Emotions shape an individual's belief about the value of a job, a company, or a team. Emotions also affect behaviors at work. Research shows that individuals within your own inner circle are better able to recognize and understand your emotions (Elfenbein&Ambady, 2002). To create awesome emotional cultures, organizations need to understand which emotions are prevalent in the workplace and how they affect employees. Positive emotions aren't limited to only optimistic and hopeful feelings. There are a lot of negative emotions that can surface at work. Basic emotions like happiness and sadness are pretty straightforward and easy to understand. But many of the emotions, we experience in the workplace, are much more complex—especially moral emotions. There's a lot that can contribute to both negative and positive emotions at work. Experiencing negative emotions expressed by others may decrease feelings of connection. As employee engagement decreases, employees may become more sensitive to negative emotions. To help decrease the expression of negative emotions at work, one need to understand the reasons before those emotions boiled over. Each type of emotion is unique and requires a unique approach to handle it. The following table critically evaluates both the positive and negative emotions of IT employees in their work culture.

Table 1 Descriptive Statistics on Emotions in the Work place

	Mean	Std. Deviation	N	Cronbach's Alpha
Upset due to bad Wi-Fi connections	3.38	1.208	150	.722
Frustrated with the timing	2.98	1.132	150	
Depressed to work at home.	2.83	1.163	150	
Dissatisfied with the salary during covid.	2.89	1.303	150	
Proud to work in this company	4.07	.946	150	
Very comfortable with the work.	3.99	.916	150	
Satisfied at work completion	4.42	.678	150	
Relaxed at work.	3.48	.880	150	

Source: Primary Survey

The Descriptive Statistics on Emotions in the Work place states that the value of mean is high for the statements Satisfied at work completion (4.42) and very comfortable with work. (4.07) is comparatively low for the statements dissatisfied with the salary during covid (2.89) and depressed due to work at home (2.83). The standard deviation is high for the statement dissatisfied with the salary during covid and is low for the statement Satisfied at work completion (.678). The value of Cronbach's Alpha is 0.722 for the eight statements taken for analysis.

Table 2 Correlation Analysis on Emotions in the Work place

Statements		Upset due to bad Wi-Fi connections.	Frustrated with the timing	Depressed to work at home	Dissatisfied with the salary	Proud to work in the company.	Very comfortable with work	Satisfied at work completion	Relaxed at work.
Upset due to bad Wi-Fi connections.	r	1							
	Sig.								
Frustrated with the timing.	r	.344**	1						
	Sig.	.000							
Depressed to work at home.	r	.095	.288**	1					
	Sig.	.248	.000						
Dissatisfied with the salary during covid.	r	.190*	.276**	.173*	1				
	Sig.	.020	.001	.034					
Proud to work in the company.	r	.025	-.105	.108	-.124	1			
	Sig.	.764	.200	.188	.129				
Very comfortable with work.	r	.233**	.090	-.001	-.029	**.620****	1		
	Sig.	.004	.271	.989	.727	.000			
Satisfied at work completion	r	.099	.055	-.035	-.037	.343**	**.491****	1	
	Sig.	.229	.506	.673	.654	.000	.000		
Relaxed at work.	r	.099	-.064	-.030	-.110	.372**	**.420****	.323**	1
	Sig.	.229	.434	.719	.179	.000	.000	.000	
**. Correlation is significant at the 0.01 level (2-tailed).									
*. Correlation is significant at the 0.05 level (2-tailed).									

Source: Primary Survey

With regards to Emotions in the Work place, the relationship is significant between very comfortable with work and proud to work in the company, satisfied at work completion and very comfortable with work and also between relaxed at work and very comfortable with work. At times, emotions are more with regards to the bad Wi-Fi connections and with regards to work completion too. On the whole work emotion have not bothered the IT employees towards the work.

Stress due to COVID 19

In this pandemic scenario, some work-related and organizational factors could play a crucial role in exacerbating or moderating the effect on people's mental health. Therefore, in addition to the medical or economic implications, it is essential to analyze the psychological side of the pandemic and the factors related to mental health in the workplace. The various psychological problems that will arise once the acute coronavirus emergency phase has passed are not receiving the necessary attention. In this way, there is a risk of witnessing the presence of another "pandemic" around the world linked to the development of possible mental disorders. In

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a recent study, Gunnel and colleagues [2020] provided accurate predictions on how the effects on mental health of the pandemic could, in turn, have an important psychological impact on the whole population. Therefore, research data for the development of evidence-based approaches are essential to reduce the negative consequences of the epidemic on psychological health Gunnel and colleagues [2020]. The Descriptive statistics and the correlation analysis of Work Stress due to COVID 19 by the IT employees are described as below.

Table 3 Descriptive Statistics on Work Stress due to COVID 19

Statements	**Mean**	**Std. Deviation**	**Cronbach's Alpha**
I feel tense or worried about the effects that the corona virus might have.	3.63	1.185	.722
Sometimes I neglect my activities and also worried about work related activities.	3.24	1.127	
Production or service processes of the organization are affected for the next couple of years due to	3.57	1.143	
Corona virus put my work at risk.	3.26	1.298	
Covid is the reason for more absenteeism in my organization.	3.29	1.201	
New work culture introduced during is helpful	3.48	1.128	
Organization operations have been negatively affected by corona virus.	3.36	1.143	

Source: Primary Survey

There are seven statements considered to test Work Stress due to COVID 19. The mean is high for the statements I feel tense or worried about the effects that the corona virus might have (3.63) and production or service processes of the organization are affected for the next couple of years due to covid and is low for the statement Sometimes I neglect my activities and also worried about work related activities. The standard deviation is high for the statement I feel tense or worried about the effects that the corona virus might have and is low for the statement Covid is the reason for more absenteeism in my organization. The value of Cronbach's Alpha is 0.722 for the seven statements taken for analysis.

Table 4 Correlation Analysis onWork Stress due to COVID 19

Correlations								
		Tensed about the effects of corona virus	Worried about work related activities	Production or service processes are affected due to covid.	Corona virus put my work at risk.	Covid is the reason for more absenteeism	New work culture is helpful	Work may be negatively affected by corona virus
Tensed about the effects of corona virus	r	1						
	Sig.							
Worried about	r	.560**	1					

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work related activities.	Sig.	.000						
Production or service processes are affected due to covid.	r	**.640****	.570**	1				
	Sig.	.000	.000					
Corona virus put my work at risk.	r	**.618****	.531**	.591**	1			
	Sig.	.000	.000	.000				
Covid is the reason for more absenteeism	r	**.610****	.438**	.556**	**.730****	1		
	Sig.	.000	.000	.000	.000			
New work culture is helpful	r	.552**	.521**	.561**	.286**	.425**	1	
	Sig.	.000	.000	.000	.000	.000		
Operations maybe negatively affected by corona virus.	r	**.680****	.547**	**.725****	**.647****	**.646****	.500**	1
	Sig.	.000	.000	.000	.000	.000	.000	
**. Correlation is significant at the 0.01 level (2-tailed).								

Source: Primary Survey

From the correlation analysis, it is exhibited that the correlation is positive and significant between Operations may be negatively affected by corona virus and Production or service processes are affected due to covid (.725), Tensed about the effects of corona virus (.680), Corona virus put my work at risk (.647), and Covid is the reason for more absenteeism (.646), between Covid is the reason for more absenteeism and Tensed about the effects of corona virus (.610), and Corona virus put my work at risk (.730), between Corona virus put my work at risk and Tensed about the effects of corona virus (.618), and between Production or service processes are affected due to covid and Tensed about the effects of corona virus (.640). The conclusion derived from the analysis is that in general the sample respondents have more tension due to risk of work.

Employee Engagement

Employee engagement is a workplace approach resulting in the right conditions for all members of an organisation to give of their best each day, committed to their organisation's goals and values, motivated to contribute to organisational success, with an enhanced sense of their own well-being. Employee engagement is the strength of the mental and emotional connection employees feel toward their places of work. Employee engagement is based on trust, integrity, two ways commitment and communication between an organisation and its members. It is an approach that increases the chances of business success, contributing to organisational and individual performance, productivity and well-being. It can be measured. It varies from poor to great. It can be nurtured and dramatically increased; it can be lost and thrown away. The descriptive statistics and the correlation analysis of Work Engagement by the IT employees are described as below.

Table 5 Descriptive Statistics on Work Engagement

Statements	Mean	Std. Deviation	Cronbach's Alpha
At work, I feel full of energy.	3.66	.834	.947
In my job, I feel strong and vigorous	3.86	.666	
When I get up in the morning, I feel like going to work	3.52	.857	
I can continue working for very long periods at a time	3.39	1.073	

In my job, I am mentally very resilient	3.45	.782	
At, work I always persevere, even when things do not go well	3.61	.776	
I find the work that I do full of meaning and purpose	3.82	.786	
I am enthusiastic about my job	4.00	.751	
My job inspires me	4.14	.724	
I am proud of the work I do	4.18	.724	
I find my job challenging	3.90	.865	

Source: Primary Survey

From the descriptive analysis, it is noted that the mean is high for the statement, I am proud of the work I do (4.18), My job inspires me (4.14), and, I am enthusiastic about my job (4.00) and is comparatively low for the statement, I can continue working for very long periods at a time (3.39). The standard deviation is high for the statement I can continue working for very long periods at a time and is low for the statement in my job, I feel strong and vigorous. The value of Cronbach's Alpha is 0.947 for the eleven statements taken for analysis.

Table 6 Correlation Analysis on Work Engagement

		Full of energy	Strong and vigorous	Early to work	work for long periods	Mentally very resilient	persevere, even at worse	Meaningful and purposeful job	Enthusiastic in the job	The job inspires me	I am proud of the work	Challenging job
Full of energy at work	r	1										
	Sig.											
Strong and vigorous at work	r	.731**	1									
	Sig.	.000										
feel like going to work in the morning	r	.690**	.684**	1								
	Sig.	.000	.000									
Continue to work for long periods	r	.422**	.604**	.612**	1							
	Sig.	.000	.000	.000								
Mentally very resilient in the job	r	.482**	.579**	.514**	.540**	1						
	Sig.	.000	.000	.000	.000							
Always persevere, even when things do not go well	r	.503**	.638**	.522**	.619**	.689**	1					
	Sig.	.000	.000	.000	.000	.000						
The work that I do full of meaning and purpose	r	.569**	.696**	.589**	.536**	.574**	.672**	1				
	Sig.	.000	.000	.000	.000	.000	.000					
Enthusiastic about the job	r	.589**	**.742****	.682**	.585**	.523**	.682**	**.773****	1			
	Sig.	.000	.000	.000	.000	.000	.000	.000				
The job inspires me	r	.655**	**.725****	.623**	.600**	.483**	.603**	**.782****	**.847****	1		
	Sig.	.000	.000	.000	.000	.000	.000	.000	.000			
Proud of the work I do	r	.659**	**.759****	.634**	.577**	.529**	.611**	**.772****	**.821****	**.881****	1	
	Sig.	.000	.000	.000	.000	.000	.000	.000	.000	.000		

Challenging job	r	.540**	.591**	.488**	.422**	.503**	.550**	.581**	.684**	**.720****	**.749****	1
	Sig.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
**. Correlation is significant at the 0.01 level (2-tailed).												

Source: Primary Survey

With regard to Work Engagement, it is ascertained from the sample respondents that the correlations are high and positive in cases of Full of energy at work with Strong and vigorous at work (.731**), between Enthusiastic about the job and Strong and vigorous at work (.742**), and between Enthusiastic about the job and The work that I do full of meaning and purpose (.773**), among the job inspires me and Strong and vigorous at work (.725**), Strong and vigorous at work (.782**), and I am enthusiastic about my job (.847**), Proud of the work I do has positive and close relationship with Strong and vigorous at work (.759**), The work that I do full of meaning and purpose (.772**), Enthusiastic about my job (.821**), and The job inspires me (.881**), and the statement Challenging job has positive and close relationship with The job inspires me (.720**), and I am proud of the work I do (.749**). It is concluded from the analysis that the statements Proud of the work, Enthusiastic about the job, and the job inspiration have more relationship than others.

CONCLUSION

Organizational and employment aspects have a considerable impact on psychological health, especially in the context of a global pandemic. The workplace, therefore, represents an important target towards which efforts should be directed to manage mental health issues related to the COVID-19 pandemic. The study which has been conducted among 150 IT Employees narrowing the research on the Work Life Integration of IT Employees during Covid Pandemic - An Empirical Analysis. The researcher has taken three aspects such as Work Emotions, Stress due to COVID 19 and Employee Engagement and interrelated the statements with the help of correlation analysis. The study depicts that emotionally the sample respondents are satisfied with the work they handle and work emotions have not bothered the IT employees towards the work. It is apparent that the sample respondents have some tension due to the risk of COVID 19. With regards to the work engagement, the value of Cronbach's Alpha is 0.947 for the eleven statements taken for analysis and it is concluded from the analysis that the statements Proud of the work, Enthusiastic about the job, and the job inspiration have more relationship than others. Hence it is concluded that irrespective of the work emotions and stress due to COVID 19, the IT employees are readily engaged in work by overcoming the hurdles.

REFERENCES

1. Bakker, A. B., &Demerouti, E. (2018). Multiple levels in job demands-resources theory: Implications for employee well-being and performance. Handbook of well-being.
2. Felstead, A., &Henseke, G. (2017). Assessing the growth of remote working and its consequences for effort, well-being and work-life balance. New Technology, Work and Employment, 32(3), 195-212. CrossRef
3. Greenhaus, J. H., Collins, K. M., & Shaw, J. D. (2003). The relation between work–family balance and quality of life. Journal of vocational behavior, 63(3), 510-531. CrossRef
4. Griffin, M. A., & Clarke, S. (2011). Stress and well-being at work. CrossRef
5. Gunnell, D.; Appleby, L.; Arensman, E.; Hawton, K.; John, A.; Kapur, N.; Khan, M.; O'Connor, R.C.; Pirkis, J.; Caine, E.D.; et al. Suicide risk and prevention during the COVID-19 pandemic. Lancet Psychiatry 2020, 7, 468–471. doi: 10.1016/S2215-0366(20)30171-1. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

6. **Ilankumaran G and Mathi T (2021),** Teaching how to learn and learning how to teach in a Pandemic World, Co creating the post COVID 19 World, Editors Dr. Mohammed Al HaziaziDr.Amer Al HajriDr.Kabaly P Subramanian Dr. Subrahmanian Muthuraman General Supervision Dr. Moosa bin Abdullah Al Kindi, Arab Open University, Sultanate of Oman, ISBN: 978-99969-838-0-1, Chapter 14, pp: 211 - 222
7. Krantz, G., Berntsson, L., & Lundberg, U. (2005). Total workload, work stress and perceived symptoms in Swedish male and female white-collar employees. The European Journal of Public Health, 15(2), 209-214. CrossRef
8. Manochehri, G., & Pinkerton, T. (2003). Managing telecommuters: Opportunities and challenges. American Business Review, 21(1), 9.
9. Sahni, J. (2019). Role of Quality of Work Life in Determining Employee Engagement and Organizational Commitment in Telecom Industry. International Journal for Quality Research, 13(2). CrossRef
10. Sullivan, S. E., &Mainiero, L. (2008). Using the kaleidoscope career model to understand the changing patterns of women's careers: Designing HRD programs that attract and retain women. Advances in Developing Human Resources, 10(1), 32-49. CrossRef
11. Ünal-Karagüven, M. H. (2009). Psychological impact of an economic crisis: A Conservation of Resources approach. International Journal of Stress Management, 16(3), 177. CrossRef
12. Wright, T. A., &Hobfoll, S. E. (2004). Commitment, psychological well-being and job performance: An examination of conservation of resources (COR) theory and job burnout. Journal of Business & Management, 9(4). CrossRef

DEVELOPMENT AND IMPLEMENTATION IN PRODUCTION OF A TECHNOLOGY FOR OBTAINING COMPOSITE MATERIALS AND PRODUCTS BASED ON VARIOUS POLYMERS

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ANNOTATION

The wide base of tires based on a polyurethane composition is currently hindered by the high cost and scarcity of polyurethane. Therefore, an attempt was made to maximize the replacement of polyurethane with less scarce polyvinyl chloride (PVC). At the same time, it was taken into account that it is inferior in many physical and mechanical characteristics of PU, especially in thermal-oxidative stability and the associated aging resistance, which is very important for the production of molded tires. Therefore, this work presents materials on the study of PVC [1-5] associated with a decrease in oxidative degradation and its use in molded polymer composites.

The selection of the optimal ratio of components and the study of the properties of the composition based on PVC, UKPE and polymer plasticizer were carried out by the methods of physical and mechanical tests, thermomechanical studies, the gel fraction was determined in the Sokolyat apparatus with tetrahydrofuran (THF) for 6 hours. The time of 6 hours was taken on the assumption that the starting PVC is completely dissolved in tetrahydrofuran after 6 hours.

Key words: *tires, polyurethane, thermal stability, polyvinyl chloride, differential thermal analysis, solubility, destruction, petroleum antioxidant, chlorocarboxylated polyethylene, destruction, plasticization process. physical and mechanical indicators [6-8].*

INTRODUCTION

Problem and its relevance in order to determine the thermostable system and predict its behavior at high temperatures, the polyvinyl chloride composition was subjected to differential thermal analysis (DTA). As a stabilizing additive, we used an oil antioxidant, a heavy spilled resin, produced at an oil refinery.

Thermal analysis of the PVC composition was carried out on a gas-commutated MOM-type derivatographic, which allows the heating chamber to be purged with atmospheric air. The rate of temperature rise is 5ºC/min. The weight of the weighed portion of the tested polymer was 1–1.3 g. The HA stabilizer was introduced in the required concentration into the PVC solution, after which the solvent was evaporated at room temperature, followed by drying the samples to constant weight in a vacuum cabinet at a temperature of 60ºC.

The manufacture of rubber compounds of various formulations was carried out in a laboratory rubber mixer with a capacity of 2 liters in two stages. Physical and mechanical tests of the developed composition were carried out on two series of samples:

1.Compositions based on polyethylene (PE);

2.Compositions based on polyvinyl chloride (PVC);

Work was carried out towards the selection of structuring monomers and the study of their effect on the properties of polyvinyl chloride. As a result of the work carried out, the fundamental possibility of structuring PVC processed from the melt with unsaturated epoxy compounds in the presence of di-tert-butyl peroxide was shown in order to increase the strength and thermal stability of PVC materials [9-12].

Currently, there is no polymer that has the same ability to modify properties with plasticizers as PVC does. The effect of plasticization, as is known, manifests itself in a change in the physical and mechanical properties of the polymer: an increase in the modulus of elasticity, elasticity, etc.

EXPERIMENTAL AND DISCUSSION

Materials

To identify the optimal ratio of the components of the composites, compositions of various composites were prepared, which are shown in Table 1.

Thermochemical studies of the composite material showed that in the case of a composites prepared according to composition 6, in comparison with other compositions, it expands the processing temperature range, which is very important in the technological processes of forming a composite material in an article.

We have carried out physical and mechanical tests of the obtained samples of the composite material. The results are shown in Table 2.

The strength and the relative elongation of the composite material blades were determined on a tensile testing machine RMI-250 at a lower clamping speed of 50 m/s.

It is interesting to note that the highest results of mechanical strength correlate well with the optimal values of the gel fraction (Table 3).

From the analysis of the nature of the change in the gel fraction, it was found that with an increase in the concentration of the plasticizer, other things being equal, the degree of crosslinking decreases monotonically.

Guided by the task of obtaining a high-strength, thermostable and, at the same time, elastic polyvinyl chloride composite material, we limited ourselves to the introduction of 20 wt.h. emulsion polyvinyl chloride and 10 wt.h. polymer plasticizer. As can be seen from the tables, it is with such a quantity of them that increased physical and mechanical indicators are obtained.

A further increase in the content reduces the strength of the composite material.

Analysis of the data obtained showed that with a composition ratio of 6, the physical and mechanical characteristics and thermal stability noticeably increase.

Our task was to obtain a composite material with high strength while maintaining elasticity, which is best achieved with the introduction of a polymer plasticizer in combination with chlorocarboxylated polyethylene.

Analysis of the derivatives obtained shows a clear glass transition temperature Tc = 84°C for the initial PVC, while for the stabilized one there is no clearly pronounced picture of devitrification due to the plasticizing effect of ND. In the range 175-215°C, a peak of dehydrochlorination combined with oxidative processes is observed, while for the stabilized PVC composition, no thermo-oxidative exothermic peak is observed. In the region of 215-250°C, polymer crosslinking processes are developing. Thus, it can be concluded that the thermooxidative dehydrochlorination is suppressed by the oil antioxidant ND in the range of operating temperatures up to 220ºC.

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Table 1. Compositions of composite materials based on PVC, in mass.

Ingredients	Train numbers					
	1	2	3	4	5	6
polyvinyl chloride C-70	70 60 60 70 75	70 60 60 70 75	70 60 60 70 75	70 60 60 70 75	70 60 60 70 75	80 80 75 70 60
dioctyl phthalate	10 20 30 20 20	- - - - -	- - - - -	20 20 10 10 0,5	- - - - -	- - - - -
dibutyl phthalate	- - - - -	10 20 30 20 20	10 20 30 20 20	- - - - -	10 20 30 20 20	- - - - -
Chlorine polyethylene	20 20 10 10 0,5	20 20 10 10 0,5	- - - - -	- - - - -	- - - - -	- - - - -
Polymer plasticizer	- - - - -	- - - - -	20 20 10 10 0,5	- - - - -	- - - - -	5 10 0,5 10 10
Polyvinyl chloride EP-700-2S	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	15 10 20 20 30

Table 2. Results of testing composite materials.

Indicators	Train numbers					
	1	2	3	4	5	6
Tear resistance MPa	12 12 11,5 11,5 11,0	12,5 12,0 11,5 11,5 10,0	12,0 12,5 13,0 12,5 12,5	10,0 10,0 11,0 10,0 10,0	9,0 10,0 9,5 10,0 10,0	18,0 17,5 17,0 18,0 18,0
Tear resistance, kn/m	20 20 15 15 10	20 20 15 15 15	20 20 25 20 20	15 15 18 15 15	12 12 11 11,5 11,5	60 60 58 59 59

Relative extension, %	150 150 160 160 150	150 150 140 140 130	150 150 140 140 140	70 70 60 70 70	70 70 65 70 75	350 350 300 340 340
Rebound elasticity, at 25ºC	10,0 10,0 10,0 9,5 9,5	10,0 10,0 9,5 9,5 9,5	10,0 10,0 9,5 9,5 9,5	7,0 7,0 6,5 7,0 7,0	7,0 7,0 6,5 7,0 6,5	11,0 11,0 10,5 11,0 11,0
at 70ºC	40 40 40 35 40	40 40 40 35 35	40 40 35 35 35	20 20 19 20 20	20 20 19 20 20	30 30 29 28 28
Shore hardness A 3	35 35 30 30 30	35 35 30 30 30	30 30 35 30 30	25 25 28 25 25	20 20 18 20 20	70 70 68 70 70

Table 3. Material test results.

Indicators	Train numbers					
	1	2	3	4	5	6
TM-2 hardness	25 25 20 20 20	25 25 20 20 20	20 20 15 20 20	15 15 13 15 15	10 10 8 10 10	60 60 57 60 60
Brittleness temperature, ºC	-8 -8 -10 -10 -8	-8 -8 -10 -10 -8	-8 -8 -8 -5 -5	-3 -3 -3 -3 -3	-3 -3 -2 -3 -2	-35 -35 -25 -20 -35
Decomposition temperature, ºC	100 100 90 90 90	100 90 95 90 95	120 120 120 100 100	95 95 90 90 90	90 90 90 90 90	170 170 165 170 170
Specific weight of the material, g / cm	1,1 1,1 1,0 1,1 1,1	1,1 1,1 1,1 1,0 1,0	1,15 1,15 1,15 1,15 1,15	1,0 1,0 1,1 1,1 1,1	1,15 1,15 1,15 1,0 1,1	1,2 1,2 1,15 1,15 1,15
Retention of tear resistance after light aging for	15 15 10 10 10	15 10 10 10 10	15 15 15 10 10	10 10 10 9 9	8 7,8 7,5 7,0 7,0	58 55 55 50 50

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Preparation and study of compositions

As a result of preliminary study of composite materials that meet the standards (Table 4), it was decided to use for research a polymer composition consisting of polyethylene or polyvinyl chloride and chlorocarboxylated polyethylene (CCPE) introduced into them with elastomeric additives in the range of 6-12% [13-19].

Table .4. Physical and mechanical indicators (norms) materials for injection tires.

№ п/п	The name of indicators	Result
1.	Tensile strength at break, MPa	30,0-45,0
2.	Shore A hardness	90-80 ед
3.	Rebound elasticity, %	30
4.	Working temperature range, ºC	-20,60
5.	Efficiency, h/m	2000
6.	Durability under cyclic bending, cycles	$4x10^6$
7.	The tire material must restore its properties after the interaction of temperatures, ºC	-60
8.	The material must be highly resistant to abrasive wear and resistant to oil products.	

In addition to those indicated, the physicomechanical parameters of the samples made of polyurethane (PU) and rubber were carried out. A total of 2 samples were examined. The results of the physical and mechanical characteristics are shown in table 5.

Table .5. Physical and mechanical indicators of laboratory investigated

Elastic rebound %	Frost resistance, ºC	Heat resistance-bone according to Martin, ºC	Wear cm / cm^3	Wear resistance, cm / cm^3
30	-60	-	-	-
32	-30-50	90	0,000016	62500
15	-30	80-100	0,000027	-
26	-70	165	0,000005	200000
31-32	-70	165	0,000008	125000
34	-70	165	0,000011	90910
10	-60	170	0,000010	100000
36-37	-70	165	0,000008	125000
10	-40	180	0,000026	47619
15	-40	180	0,000026	38462
17	-40	180	0,000018	55556
15	-40	180	0,000024	41667

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№ by order	song names	Density kg / m^3	Hardness according to TM-2, conv. units	Tensile strength at break, MPa
1.	Требуемые параметры	-	80-90	30,0-45,0
2.	ПУ	100-190	71-72	-
3.	Резина	-	68	25,0-35,0
4.	ПЭ-1	918-930	95	22,0-30,0
5.	ПЭ-2	918-930	31-32	22,0-30,0
6.	ПЭ-3	918-930	22	22,0-30,0
7.	ПЭ-ПТФЭ	138	69-70	60,0
8.	ПЭ-4	918-930	90	22,0-30,0
9.	ПВХ	123-126	65-68	10,0-25,0
10.	ПВХ-1	123-126	82	10,0-25,0
11.	ПВХ-2	123-126	84	10,0-25,0
12.	ПВХ-3	123-126	78-80	10,0-25,0

PE-1 - original polyethylene; PE-2-polyethylene with the addition of HKPE 12%; PE-3-polyethylene with HKPE additive; PE-PTFE-polyethylene with PTFE additive; PE-4-polyethylene with 10% HKPE additive; PVC-1-polyvinyl chloride with the addition of HKPE 8%; PVC-polyvinyl chloride with the addition of HKPE 6%; PVC - polyvinyl chloride with the addition of HKPE 12%.

To carry out wear tests, polymer samples were made (pressed) in the form of cylinders with a diameter of 15 mm and a height of 10 mm. The test piece is fixed in a collet, which is located above the drum. The drum is driven into rotation by a drive. The test piece is lowered onto an abrasive cloth and moved over the surface of the cloth [13-12].

The grain diameter of the skin is dz = 80 microns. The length of one pass on the skin is L = 34 m.

The sample was weighed prior to testing. After the first pass through the surface of the skins, re-weighing was carried out. The average weight per pass was calculated from the difference in the weights of the pass on the skin and afterwards crosslinking and this leads to a decrease in the formation of a three-dimensional structure.

Physical and mechanical properties of plasticized PVC cross-linked with unsaturated epoxy compounds.

In order to determine the physical and mechanical properties of the plasticized structuring polyvinyl chloride during processing, a number of compositions were prepared with different contents of the plasticizer dibutyl sebacate of unsaturated epoxy compounds (glycidyl allyl ether), the initiator di-tert-butyl peroxide.

The above components were thoroughly mixed, subjected to a gelatinization process, contributing to the achievement of full compatibility of polyvinyl chloride with a plasticizer and other anhydrides.

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Gelatinization was carried out for 1 hour at 70°C. Rolling of the composition was carried out on micro-rollers with electric heating for 10 minutes at a temperature of 130-140°C. The film-forming process takes place without technological difficulties. The films formed are easily removed from the rollers. The resulting PVC films were molded by direct hot pressing at a temperature of 160-170ºC for 25-30 minutes and a specific load of 9.0-1% MPa, followed by water cooling. Samples in the form of blades with a working section width of 6 mm and a thickness of 1 mm were tested on a Hungarian pendulum tensile testing machine. The results of physical and mechanical tests are shown in tables .6 to .8.

Table 6. Change in effective viscosity of plasticized cross-linked PVC depending on the concentration of components

Components and properties of compositions	Mass ratio of components in compositions					
PVC	100	100	100	100	100	100
GAE	10	10	10	20	20	20
PL	10	20	30	10	20	30
PDTB	3	3	3	3	3	3
Effective viscosity at 160°C, poise						
$9{,}3 \cdot 10^5$ $8{,}8 \cdot 10^5$ $7{,}3 \cdot 10^5$ $5{,}2 \cdot 10^5$ $4{,}0 \cdot 10^5$						

For this purpose, films were tested with the same concentration of di-tert-butyl peroxide in the composition equal to 3 parts by weight. The study of the dynamometric properties shows that the strength of the tablets decreases with an increase in the content of the plasticizer. Films with the lowest concentration of plasticizer have the maximum strength. Moreover, an increase in the amount of structuring monomer also leads to a decrease in strength. Diglycidyl ether is an exception. Such an anomalous deviation in a generally understandable pattern can be attributed to the peculiarity of the nature of diglycidyl ether. An increase in the amount of plasticizer in a PVC film leads to an increase in elasticity, which is consistent with the generally accepted concepts of the theory of plasticization.

Table7. Physical and mechanical properties of plasticized crosslinked GAE polyvinyl chloride.

Components and properties of compositions	Mass ratio of components in compositions					
PVC	100	100	100	100	100	100
GAE	10	10	10	20	20	20
PL	10	20	30	10	20	30
PDTB	3	3	3	3	3	3

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Tensile strength when stretched, MPa	56,0	52,0	44,0	53,0	48,0	40,0
Resistance tear, kn/m	30	100	180	60	110	200
Flammability, sec	3	3	4	3	3	4
Hardness by TM-2, conventional units	58	54,0	58	62,0	60	54,0

When rolling plasticized systems containing chemically active components, the technological mode of obtaining PVC material based on this composition becomes very important.

It should be noted that the change in the rheological properties of the melt is influenced by the nature of the structuring monomer and its ether; as a crosslinking agent, there is a general increase in viscosity with respect to other modifiers.

The technological regime in this case predetermines the predominance of the process of physical plasticization or chemical structuring. The plasticization process, which takes 10 minutes at a temperature of 130-140ºC, contributes to the plasticization of polyvinyl chloride, as a result of which the well-known and proven processes of orientation and straightening of supramolecular formations of polymer "packs" occur.

Table .8. Physicomechanical parameters of plasticized crosslinked FGAE polyvinyl chloride

Components and properties of compositions	Mass ratio of components in compositions					
PVC	100	100	100	100	100	100
FGAE	10	10	10	20	20	20
PL	10	20	30	10	20	30
Tensile strength when stretched, MPa	50,0	47,0	39,0	48,0	41,0	35,0
Elongation at gap,	60	130	220	120	210	300
Flammability, sec	3	3	1	3	3	4

CONCLUSİONS

We have carried out a study of the influence of the above components on the physical and mechanical properties of modified polyvinyl chloride. Based on the analysis of the study of thermomechanical curves and the gelation process, physicomechanical tests were performed on PVC films obtained from the composition with the highest percentage of gel fraction, which, in our opinion, can provide the pursued goal - the production of elastic PVC films, which can be facilitated by the introduction plasticizer in the composition

The test results showed that the wear resistance of the composition based on polyvinyl chloride samples is 2-3 times lower than that of the composition based on polyethylene. The value of the wear resistance of polyurethane samples is between the values of the wear resistance of polyethylene and polyvinyl chloride compositions.

Samples PE-3 and PE-4 showed high hardness, then in decreasing order of hardness PE-1, PVC-2, PVC-3, PU, PE-PTFE rubber PVC and PE-2.

The tensile strength of a composition based on polyethylene ranges from 22.0-30.0 MPa, and a composition based on polyvinyl chloride 10.0-25.0 MPa.

REFERENCES

[1] Amirov F.A., Shikhaliyev K.S., Ahmadova U.T.: International Journal of Development Research, 2018,**8**, 21902.

[2] Shikaliyev K.S.: Monomers for the synthesis of polymers (TRAINING MANUAL) Lambet, Academic Publishing. Saorbrucken. 2017, 46.

[3] Shikaliyev K.S.: International Scientific and Practical Conference «WORLD SCIENCE» Dubai, UAE, 2017, **1**, 46.

[4] Shikhaliyev K.S.: The European science review, Vienna, 2017, №5-6, 89.

[5] Shikhaliyev K.S.: The European science review, Vienna, 2017, №3-4, 41.

[6] Forrest Martin: Progress in Rubber Plastics Recycling Technology, 2015, **31**, 219, https://doi.org/10.1177/147776061503100401

[7] D. Simonov – Yemelyanov, V.W. Kuznetsov. Principles of compositional materials creation. Text-book. M. MICT, 1987, 85p.

[8] Base of technology processing of plastic mass. Text-book for high schools/S.V. Vlasov, M. “Chemistry”, 2004, 600p.

[9] V.F. Vakhidov, O.M. KArimov, Z.E. Eyvazova. Technics of oil-gas production, Baku, Azerneshr, 2008, 440p.

[10] V.K. Krijanovsky, M.A. Kerber, V.V. Burlov. Production of products from polymer materials. Sankt-Petersburg, 2008, 450p.

[11]. Kerem Shixaliyev. Propeties of the Composition Based on modified Polyethylenes. International journal of Innovative Technology and Exploring Engineering. Volume-9 issue- / Januaru 2020.pp2484-2493 Pp / 2484-2293 ISSN-2278-3075, SCOPUS https://www.ijitee.org/download/volume-9-issue-7/

[12]. Kerem Shixaliyev. Modification of Polymer Wastes and Obtaining Com Composites Based on Them Annotation. International Journal of Innovative Technology and Exploring Engineering (IJITEE). Volume-9 Issue-5, March 2020 Pp.1072-1076. ISSN: 2278-3075, SCOPUS.Retrievai Number-E2156039520 | 2020 © BEIESP https://www.ijitee.org/instructions-for-authors/

[13] Amirov Fariz.Shixaliyev Kerem. Properties of Linear Low-Density Polyethylene. International Journal of Innovative Technology and Exploring Engineering (IJITEE). Volume-9 Issue-9, July 2020.pp. 348-352 ISSN: 2278-3075. SCOPUShttps: //www.ijitee.org/download/volume-9-issue-3/

[14]. Kerem Shixaliyev. Paint and Varnish Materials Based on Epoxy Novolac oliqomers Jour of Adv Research in Dynamical & Control Systems. Vol. 12, Special Issue-02, 2020.pp351-358

[15] Kerem ShixaliyexSefi.DETERMINATION OF COMPATIBILITY OF POLYMER SYSTEMS, SKEP, PU, KhKPE and CH EMICAL FEATURES OF THEIR MIXTURES. Jour of Adv Research in Dynamical & Control Systems. Vol. 12, Special Issue-02, 2020.pp359-370

[16] Ermilova EA, Sizova AA, Ilyicheva NN, Pleshakov DV // Study of thermodynamic compatibility of a three-component mixture of nitramines with a copolymer of methyl methacrylate and methacrylic acid technology / Chemical successes. .-2014 - №2.-p.65-67.

[17] Turaev ER, Beknazarov HS, Akhmedov UK, Dzhalilov AT// Interfacial interactions of three-phase polypropylene composite materials./Universum.Technical sciences/- 2018-№12.-p.57

[18] Shastin DA, Wolfson SI, Makarov TV // The impact of modification of triple ethylene propylene rubber on the physical and mechanical properties of rubber. /Vestnik of Kazan Technological University.-2010-№4.-p.5-7

[19. Шыхалиев К. Modification of bitumen with polyethylene and rubber waste. World science Warsaw Poland2018 -№1 (29) 2 С.28-30Zsglolal.poland @ gmail.com

THE EFFECT OF PROCEDURAL JUSTICE, TRUST AND ORGANIZATION COMMITMENT ON ORGANIZATIONAL CITIZENSHIP BEHAVIOR OF PRIVATE SENIOR HIGH SCHOOL TEACHER IN BEKASI DISTRICT

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ABSTRACT

The objective of this research was to study the effect of justice, trust, and organizational commitment on the organizational citizenship behavior of teachers in Bekasi. The research was conducted by using a survey method with path analysis applied on testing the hypothesis. The target population size of this research is 703 of teachers. The research sample was 255 teachers using the proportional random sampling technique. Based on this research of data obtained the following conclusions: (1) procedural justice has a positive direct effect on organization behavior citizenship of teacher's, (2) trust has a positive direct effect on organization citizenship behavior of teacher's, (3) organization commitment has a positive direct effect to organizational citizenship behavior of teacher's, (4) the procedural justice has a positive direct effect to organization commitment, (5) trust have a positive direct effect to organizational commitment. The conclusion is that the teacher's organizational citizenship behavior is affected by procedural justice, trust, and the teacher's organizational commitment.

Keywords: Organization Behavior Citizenship, Prosedural justice, Trust, and Organization Commitment

I. INTRODUCTION

National education must be able to ensure equitable distribution of educational opportunities, quality improvement, and the relevance and efficiency of education management. Increasing the relevance of education is intended to produce graduates who are in accordance with the demands of the needs. Increasing the efficiency of education management is carried out by reforming education management in a planned, directed and sustainable manner. Improving the quality of education in schools requires professional and systematic education in achieving its goals. The effectiveness of educational activities in a school is influenced by many variables such as the professional competence of school principals, school principal decision making, work climate and work environment, teacher performance and so on. These variables need continuous attention in accordance with the mandate of Law Number 20 of 2003 concerning the National Education System and its implementation guidelines listed in Government Regulation Number 19 of 2005 concerning National Education Standards and then followed by the enactment of the teacher and lecturer law. Then the profession of the principal as a professional position becomes increasingly clear. Efforts to improve the quality of human resources are an important thing in achieving national development goals. This should be realized because human resources have the role of planning and implementing development. Thus, development goals will only be realized if supported by qualified human resources. The definition of organizational citizenship behavior is expressed by Lutans as, organizational citizenship behavior is an individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization (Lutans, 2008). From this definition, it can be interpreted that organizational citizenship behavior is the behavior of individuals in organizations outside of their work. In addition, this behavior is not behavior that is detrimental to the organization, on the contrary, it encourages the effectiveness of organizational functions.

When schools do not have teachers who demonstrate organizational citizenship behavior, their progress will be slower. You can imagine if the teacher only wants to teach the content of the material without wanting to do more so that students can deepen this knowledge. Teachers will also complain more often than work for the educational success for which they are responsible. Of course, schools expect teachers to be motivated to work beyond the minimum expectations of their assignments. The success or failure of the school depends on the teachers in the school environment who are committed to the values and goals of the school and are willing to do everything and contribute to the school. The problem of organizational citizenship behavior is very unique, because this behavior actually "deviates" from the employee's job description, but if it is done, it can help in organizational effectiveness. The increase in organizational citizenship behavior is presumed to be the influence of employees' views on organizational justice, trust, and organizational commitment. Based on the above background, it is deemed necessary to conduct research with the aim of knowing the effect of procedural justice, trust, and organizational commitment on the performance of private high school teachers in Bekasi District.

II. LITERATURE REVIEW

a. Organizational Citizenship Behavior

Organizational citizenship behaviors are the extra things people do beyond their job. OCBs are the extras people do to go the extra mile in their work. A person who is a good organizational citizen does things that although not required of them help others (Schermerhorn, 2010). Organizational citizenship behaviors that extend beyond the employee's normal duties, they help others without selfish intent, are actively involved in organizational activities, avoid unnecessary conflicts, perform tasks beyond normal role requirements, and gracefully (McShane, Glinow 2008). In general, organization citizenship behavior refers to behaviors that are not actually written as job descriptions or are not jobs that he does in order to receive wages. For example, helping colleagues who are absent, behave politely with others, or behaviors where employees are not formally rewarded. OCB refers to behaviors that are not part of employees' formal job descriptions (e.g., helping a coworker who has been absent; being curteous to others), or behaviors which employees are not formally rewarded (Steve Jex, 2008). Organization citizenship behavior carried out by employees in an organization takes different forms. OCBs consist of employee behaviors that are beyond the call of duty. Examples include, such gestures as constructive statements about the department, expression of personal interest in the work of others, suggestions for improvement, training new people, respect for the spirit as well as the letter of housekeeping rules, care for organization property and punctuality and attendance well beyond standard or enforceable levels (Kreitner, Kinicki, 2010). Organizational citizenship behavior is discretionary behavior (e.g., helping others) that benefits the organization and its goals and wants to stay with the organization (Phillips, 2012). Organizational citizenship behavior exceeds formal job duties but is often necessary for the organization's survival, including its image and acceptance. Examples of organizational citizenship behavior include helping coworkers solve problems, making constructive suggestions, volunteering to perform community service work (Slocum, 2007). OCB as "individual behavior that is discretionary, not directly or explicity recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization. The personality foundation for these OCBs reflects the employee's predispositional traits to be cooperative, helpful, caring, and conscientious (Luthans, 2011).

Organizational Citizenship Behavior is discretionary behavior that is not part of an employee's formal job requirements, but that nevertheless promotes the effective functioning of the organization (Robbins & Judge, 2009). Organizational citizenship is often marked by its spontaneity, its voluntary nature, its constructive impact on result, its unexpected helpfulnes to others, and the fact that it is optional (Newstorm, 2007). These behaviors benefit the larger organization by supporting and defending the company, working to improve its operations, and being especially loyal to it (Colquitt, Lepine, Wesson, 2011). From the various descriptions above, it can be synthesized that organization citizenship behavior is an action taken by employees outside of their formal duties voluntarily with indicators: (1) helping colleagues; (2) polite in work; (3) be patient; (4) cares about the interests of the organization; (5) cooperate for the betterment of the organization.

b. Prosedural Justice

Procedural justice is the degree to which the rules and procedures specified by policies are properly followed in all cases to which they are applied (Schermerhorn, 2012). Procedural justice is already at the stage of implementing the agreed rules. Procedural justice used to generate the outcome (e.g., what rules were followed, whether people had the opportunity to express opinions and influence the outcome, etc). For example, let's continue the example of your applying for a job at the same time as your friend but your friend getting the position (Phillips, 2012). Procedural justice is the reasonableness of a procedure used to produce the goals of an organization in running its organization. For example, the opinion rule, people have the opportunity to express opinions and influence the results. Procedural justice refers to the ways in which managerial decisions are made and reward policies are implemented. The aspect of implementing procedural justice is emphasized in this understanding. The perceived fairness of rules and how decisions are made is referred to as procedural justice. Procedural justice holds that employees are going to be more motivated to perform at a high level when they perceive as fair the procedures used to make decisions about the distribution of outcomes (Slocum, 2007). The perceived fairness of rules and how decisions are made is referred to as procedural justice. Procedural justice states that an employee will be more motivated to work better when they think there is justice that is used to make decisions about the division of tasks. Procedural justice is a concerned with the fairness of the procedure used to make a decision. For example, a pay raise may be based on a sales representative selling more units of (Luthans, 2011). For example, a raise might be based on selling more. This will motivate an employee to work better than before, but on the other hand, if an injustice occurs, the employee will feel disadvantaged by an unfair decision.

Procedural justice which is the perceived fairness of the process used to determine the distribution of rewards. Two key elements of procedural justice are process control and explanations. Process control is the opportunity to present one's point of view about desired outcomes to decision makers. Explanations are clear reasons for the outcome that management gives to a person (Robbins, 2009). Procedural justice refers to the perceived equity or fairness of the organization's processes and procedures used to make resource and allocation decisions. That is employees are concerned with the fairness of decision making in all areas of work, including decisions related to compensation, performance appraisal, training, and work group assignments (Ivancevich, 2008). When people see procedural fairness, they are more likely to support decisions and decision makers. Based on the conceptual description above, it can be synthesized that procedural justice is the reasonableness of the treatment of a rule or procedure

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used in carrying out work to produce organizational goals with indicators: (1) rule enforcement; (2) freedom of opinion; (3) accurate information; (4) care about decisions; (5) reasonableness of decision making; (6) equal distribution of tasks.

c. Trust

Trust can be interpreted as one party's optimistic expectation of the other's behavior, when that party has to make decisions on how to act. Trust is defined as one party's optimistic expectation of the behavior of another, when the other must make a decision about how to act (Andre, 2008). Trust is formed if there is reciprocity, including between the organization and its employees. Conversely, employees will only trust their place of work when the goals of the organization are in line with them. Trust refreshes to positive expectations one person has toward another person in situations involving risk. A high level of trust occurs when others affect you in situations where you are at risk but you believe they will not harm you (McShane & Glinow, 2010). Trust refers to the positive expectations one person has for another in situations that involve risk. A high level of trust occurs when another person influences someone in a situation where that person is at risk but believes that they will not harm the employee. By trust, we are referring to a person's degree of confidence in the words and actions of another (Greenberg, 2012). Trust is defined as the willingness to be vulnerable to an authority based on positive expectations about the authority's actions and intentions (Colquitt et al, 2011).

Trust is a positive expectation by another in other words, actions, or decisions- act opportunistically (Robbins & Judge, 2009). This positive expectation will form and develop over time. Of course, it can be hard to trust someone you just met. However, the longer you know someone and your relationship develops, you will have more confidence in one's ability to form positive expectations. Meanwhile, opportunistic cannot be separated from the risk and vulnerability in the relationship with trust. Trust naturally provides room for disappointment or use. This means by giving trust to other people or organizations, there is a risk of being disappointed or taken advantage of. Trust is multifaceted concept that captures one's faith or belief in the integrity or reliability of another person or thing. Simply, trust means confidence. When you trust people, you have confidence in them-in their integrity and in their abilities (De Janasz et al, 2009). To trust others, means trusting that person, especially in terms of integrity and abilities. Trust is the expectation that another person will not act take advantage of us regardless of our ability to monitor or control them. Trust has been called "the social glue that holds things together" and is critical to long-term relationships (Phillips, 2012). Trust is important in maintaining relationships with everyone. A leader expects all employees to be trusted as part of the organization. On the other hand, employees also expect the leadership to be trusted in carrying out their duties as a manager or as a leader. Mutual trust will facilitate the achievement of organizational goals. This can be interpreted that trust is a psychological condition consisting of the intention to accept vulnerability based on positive expectations of the intentions or actions of others. Based on the description above, it can be synthesized that trust is a person's belief in the intentions and actions of an authority with the following indicators: (1) belief in others; (2) think positively of others; (3) give hope to others.

d. Organization Commitment

Organizational commitment is defined as the desire on the part of an employee to remain a member of the organization (Colquitt, 2011). Organizational commitment affects whether an employee stays or leaves to pursue another job. Organizational commitment will influence an employee to stay or not in an organization. Organizational commitment reflects the extent to which an individual identifies with an organization and is committed to its goals (Kreitner & Kinicki, 2010). This illustrates that the high level of commitment of employees has a strong desire and willingness to achieve organizational goals while remaining committed to the organization. Organizational commitment is a condition in which employees are very interested in the values and goals of their organization. Based on this definition, organizational commitment includes elements of loyalty to the organization, involvement in work, and identification of the values and goals of the organization. Organizational commitment or employee loyalty, is the degree to which an employee identifies with the organization and wants to continue actively participating in it. Like a strong magnetic force attracting one metallic object to another, it is a measure of the employee's willingness to remain with a organisation in the future (Newstrom, 2007). Organizational commitment is very important for an employee for the progress of an organization. Organizational commitment is a bond between individuals and organizations that focuses on the relative strength of the identification of individuals with involvement in a particular organization. Organizational commitment reflects the degree to which an employee identifies with the organization and its goals and wants to stay with the organization (Phillips, 2012). The identification of problems carried out by an employee will determine how strong the employee will last or stay in an organization.

Organizational commitment is the desire to work hard for the organization, and the desire to stay in the organization. As an attitude, organizational commitment is most often defined as (1) a strong desire to remain a member of a particular organization; (2) a willingness to exert high levels of effort on behavior of the organization, and (3) a definite belief in, and acceptance of, the values and goals of the organization (Luthans, 2011). Organizational commitment a state in which an employee identifies with a particular organization and its goals and wishes to maintain membership in the organization. There are three separate dimensions to organizational commitment: (1) affective commitment: An affective commitment means he has an emotional attachment to the organization and belief in its values (2) continuance commitment: A continuance commitment is the perceived economic value of remaining with an organization compared to leaving it (3) Normative commitment: A normative commitment is an obligation to remain with the organization for moral or ethical reasons (Robbins, 2009). Commitment to an organization involves three attitudes: (1) a sense identification with the organization's goals, (2) a feeling of involvement in organizational duties, and (3) a feeling of loyalty to the organization (Ivancevich et al, 2008). In addition, organizational commitment means something more than just passive loyalty to the organization, in other words, organizational commitment implies an active relationship between employees and the company or organization. Employees, who show high commitment, have a desire to give more energy and responsibility to support the welfare and success of the organization where they work. Based on the definition of the concept above, it can be synthesized that organizational commitment is the strong desire of an employee for an organization in relation to loyalty and willingness to remain a member of the organization and strive to achieve organizational goals with indicators: (1) affective commitment; (2) sustainability commitment; (3) normative commitment.

III. METHOD

This quantitative research uses a survey method through a path analysis approach. The instrument used for all variables was a questionnaire. Before being used in the study, the instrument was tested to test the validation and reliability of each item of the instrument so that it could be used in the study. The study was conducted on 255 private high school teachers in Bekasi District. The number of teachers as many as 255 teachers was taken as a sample using the Slovin formula. A sample of 255 teachers was obtained using a simple randomized method from the population and scattered in Bekasi Regency. The data in this study were concluded using a questionnaire-shaped instrument which included a questionnaire of procedural justice, trust, and organizational commitment, which had gone through the empirical validation stage

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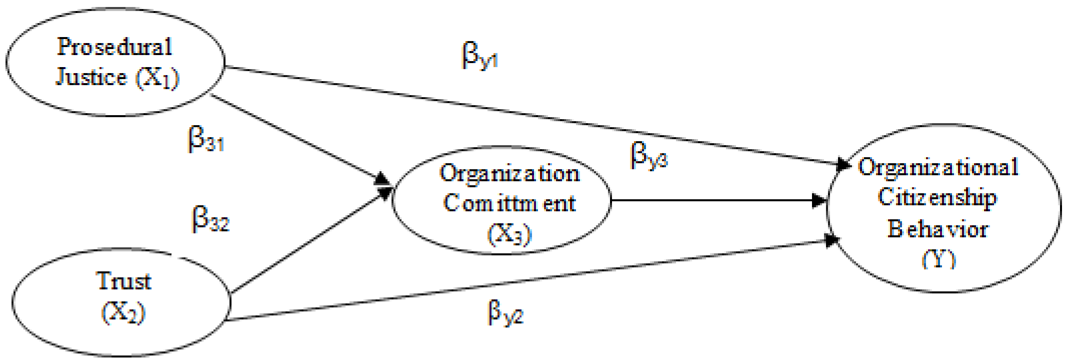
through instrument testing. The relationship between each variable in this study is presented in the form of a constellation as follows:



IV. RESULT AND DISCUSSION

Before the path analysis was carried out, the researcher determined the regression equation between variables: (1) $\hat{Y} = 49.678 + 0.649\ X_1$, (2) $\hat{Y} = 44.350 + 0.683\ X_2$, (3) $\hat{Y} = 61.448 + 0.541\ X_3$, (4) $\hat{X}_3 = 63.699 + 0.497\ X_1$, (5) $\hat{X}_3 = 32.976 + 0.739\ X_2$. In order for regression analysis to be carried out, then requirement testing is imperative. Data analysis to test the research hypothesis was carried out by statistical analysis or path analysis. Before testing the hypothesis, a prerequisite analysis test is carried out which includes the following: (1) normality test for estimation errors, and (2) significance test and regression linearity. The normality test of estimated errors uses the Liliefors test. The test criteria is if $L_{count} < L_{table}$ at $\alpha = 0.05$ then the regression equation is normally distributed. Based on the results of the calculation of the normality test for the estimate of Y on X_1, Y for X_2, Y on X_3, X_3 on X_1, and X_3 on X_2, all of them show that $L_{count} < L_{table}$ so that all regression equations are normally distributed.

Table 1: Normality Test Results

Estimated Error	L_{count}	L_{table}	Normality Test
Y on X_1	0,051	0,055	Normal Distribution
Y on X_2	0,042	0,055	Normal Distribution
Y on X_3	0,031	0,055	Normal Distribution
X_3 on X_1	0,048	0,055	Normal Distribution
X_3 on X_2	0,053	0,055	Normal Distribution

The significance test was carried out by calculating ANOVA with the testing criteria if $F_{count} > F_{table}$ at $\alpha = 0.05$ then the regression coefficient between variables was significant. Based on the results of the calculation of the significance test, everything shows that $F_{count} > F_{table}$, so the regression coefficient between all variables is very significant. To test the linearity of the simple regression equation with the criteria that if $F_{count} < F_{table,}$ the relationship between variables is linear. Based on the results of the linearity test calculations, everything shows that $F_{count} < F_{table}$, so all relationships between variables are linear.

Table 2: Simple Regression Significance Test Results and Regression Linearity Tests

Reg	Equality	Significance Test		Linearity Test		Conclusion
		F_{count}	F_{table} $\alpha = 0,05$	F_{count}	F_{table} $\alpha = 0,05$	

Y on X_1	$\hat{Y} = 49{,}678 + 0{,}649\ X_1$	107,698	$3{,}878^{ns}$	1,723	$1{,}733^{**}$	Very significant/ Linear regression
Y on X_2	$\hat{Y} = 44{,}350 + 0{,}683\ X_2$	141,763	$3{,}878^{ns}$	0,612	$1{,}733^{**}$	Very significant/ Linear regression
Y on X_3	$\hat{Y} = 61{,}448 + 0{,}541\ X_1$	92,944	$3{,}878^{ns}$	1,063	$1{,}686^{**}$	Very significant/ Linear regression
X_3 on X_1	$\hat{X}_3 = 63{,}699 + 0{,}497\ X_1$	59,559	$3{,}878^{ns}$	0,998	$1{,}733^{**}$	Very significant/ Linear regression
X_3 on X_2	$\hat{X}_3 = 32{,}976 + 0{,}739\ X_1$	213,548	$3{,}878^{ns}$	1,141	$1{,}733^{**}$	Very significant/ Linear regression

After testing test estimation error normality test, significance test and linearity regression, a path analysis is performed to test the research hypothesis. The following table explains the results of the calculation and testing of the path coefficient with t table = 1.651 for $\alpha = 0.05$ with the criteria if $t_{count} > t_{table}$ then the path coefficient test results show that the path is very well shaped and can explain the influence between variables.

Table 3. Calculation Results and Path Coefficient Testing

Path	Correlation Coefficient	Path Coefficient	T_{count}
X_1 to Y	$r_{1y} = 0{,}546$	$p_{y1} = 0{,}341$	6,592
X_2 to Y	$r_{2y} = 0{,}599$	$p_{y2} = 0{,}386$	6,116
X_3 to Y	$r_{3y} = 0{,}518$	$p_{y3} = 0{,}108$	1,694
X_1 to X_3	$r_{31} = 0{,}437$	$p_{31} = 0{,}191$	3,866
X_2 to X_3	$r_{32} = 0{,}677$	$p_{32} = 0{,}598$	12,102

Thus, it can be concluded that the path between the procedural justice on organizational citizenship behavior, trust in organizational citizenship behavior, and organizational commitment to organizational citizenship behavior, procedural justice to organizational commitment, and trust in organizational commitment, the path coefficient is significant because the value of t_{count} > of t_{table}. The path coefficient test result in this study indicate that the path is in very well shaped and can explain the effect of procedural justice, trust, and organizational commitment to the organizational citizenship behavior of private high school teachers in Bekasi District. So that it can explain the influence of exogenous variables with the endogenous variables analyzed.

a. Procedural Justice and Organizational Citizenship Behavior

Hypothesis testing shows the effect of procedural justice on organizational citizenship behavior with a correlation coefficient of 0.546 and a path coefficient of 0.341. The results of the significance test obtained $t_{count} = 6{,}592 > t_{table} = 1.651$. These results indicate a significant path coefficient. In this study, the results of testing the first hypothesis indicate that H_o is rejected. This means that procedural justice has a significant influence on organizational citizenship behavior. The positive value of the path coefficient indicates that procedural justice has a positive effect on organizational citizenship behavior. And the results of further testing with the t-test confirm that the positive direct effect of work design on organizational citizenship behavior is very significant. Procedural justice will affect the increase of organizational citizenship behavior in teachers.

The results of this study are in accordance with Jex's opinion, namely "if employees perceive that the organization is treating them fairly or justly, then they are likely to reciprocate the organization by engaging in OCB" (Jex, 2008). As previously stated, organizational justice consists of three forms, namely distributive justice, procedural justice and interactional justice. These three forms of justice are related to organizational citizenship behavior. Procedural justice is a very important factor in improving the Organization Citizenship Behavior of teachers. Thus, it is hoped that teachers will have enforcement of the rules that apply in schools. A teacher who is willing to obey his duties, obeying the rules that apply in school will increase his Organization Citizenship Behavior. Thus, good procedural justice results in an increase in the Organization Citizenship Behavior for private high school teachers in Bekasi Regency.

b. Trust and Organizational Citizenship Behavior

Hypothesis testing shows the effect of trust on organizational citizenship behavior with a correlation coefficient of 0.599 and a path coefficient of 0.386. The results of the significance test obtained t_{count} = 6,116 > t_{table} = 1.651. These results indicate a significant path coefficient. In this study, the results of testing the second hypothesis indicate that H_o is rejected. The results showed that trust has an effect on organizational citizenship behavior, it can be interpreted that high trust will lead to an increase in organizational citizenship behavior for private high school teachers in Bekasi District. Based on this empirical evidence, it is said that this finding shows that trust is one of the variables that has a direct effect on the organizational citizenship behavior variable.

Trust will affect the increase of organizational citizenship behavior in teachers. Specifically, trust between an employee and a manager and a management style that encourages development of leadership skills among employees have been found to encourage the expression of OCB (Ivancevich, (2008). The teacher, who has confidence in management, will create communication that is effective in doing their job. An attitude of mutual trust will be formed. Thus, the principal or school does not need to spend too much time monitoring teachers. Furthermore, teachers who have high confidence will voluntarily show organizational behavior which can certainly help successfully the school in achieving its goals.

c. Organization Commitment and Organization Citizenship Behavior

Hypothesis testing shows the effect of organization commitment on organizational citizenship behavior with a correlation coefficient of 0.518 and a path coefficient of 0.108. The results of the significance test obtained t_{count} = 1,694 > t_{table} = 1.651. These results indicate a significant path coefficient. In this study, the results of testing the third hypothesis indicate that H_o is rejected. Thus, it is concluded that there is a positive direct effect of organizational commitment to organizational citizenship behavior. The results showed that organizational commitment has an effect on organizational citizenship behavior, it can be interpreted that an increase in organizational commitment felt by teachers will lead to an increase in organizational citizenship behavior for private high school teachers in Bekasi District. Based on this empirical evidence, it is said that these findings indicate that organizational commitment is one of the variables that has a direct effect on the organizational citizenship behavior variable.

Organizational commitment will affect the increase of Organizational Citizenship Behavior in teachers. The results of this test show that organizational commitment has a positive direct effect on Organization Citizenship Behavior. The results of this study are in line with McShane's opinion, Organizational commitment also improves customer satisfaction because long-tenured employees have better knowledge of work practices, and clients like to do business with the same employees. Employees with high affective commitment also have higher work motivation and organization citizenship, as well as somewhat higher job performance (McShane, 2010). Thus, organizational commitment resulted in an increase in the level of Organization Citizenship Behavior for private high school teachers in Bekasi District.

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d. Procedural Justice and Organization Commitment

Hypothesis testing shows the effect of procedural justice on organizational commitment with a correlation coefficient of 0.437 and a path coefficient of 0.191. The results of the significance test obtained t_{count} = 3,866 > t_{table} = 1.651. These results indicate a significant path coefficient. In this study, the results of testing the fourth hypothesis indicate that H_o is rejected. Thus, it is concluded that there is a positive direct effect of procedural justice on organizational commitment. Procedural justice will influence on the organizational commitment of the teacher. The results showed that procedural justice had an effect on organizational commitment, it could be interpreted that the procedural justice that teachers had, would lead to an increase in the level of organizational commitment of private high school teachers in Bekasi District.

Based on this empirical evidence, the findings indicate procedural justice is one of the variables that has a direct effect on the organizational commitment. The results of this study are supported by McShane's opinion as, "procedural justice is as important as distributive justice, and it influences organizational commitment, trust and various withdrawal and aggressive behaviors (McShane, 2010).

e. Trust and Organization Commitment

Hypothesis testing shows the effect of trust on organizational commitment with a correlation coefficient of 0.677 and a path coefficient of 0.598. The results of the significance test obtained t_{count} = 3,866 > t_{table} = 1.651. These results indicate a significant path coefficient. In this study, the results of testing the fifth hypothesis indicate that H_o is rejected. Thus, it is concluded that there is a positive direct effect of trust on organizational commitment. The results showed that trust has an effect on organizational commitment, which means that good trust will lead to an increase in the level of organizational commitment of private high school teachers in Bekasi District. Based on this empirical evidence, it is said that this finding shows that trust is one of the variables that has a direct effect on the organizational commitment. Trust will have an effect on increasing organizational commitment to teachers.

This result is in accordance with the opinion of Eran Vigoda-Gadot and Amos, "along with organizational politics, organizational support and organizational trust have each been shown, either directly or indirectly, to influence commitment (Eran Vigoda-Gadot & Amos Drory, 2006). Thus, good trust results in an increase in the level of commitment of the private high school teacher organizations in Bekasi District.

V. CONCLUSION

Based on the results of calculations and hypothesis testing and discussion of research results that have been stated through research conducted on private high school teachers in Bekasi Regency, the research conclusions are as follows: (1) procedural justice has a positive direct effect on the Organizational Citizenship Behavior of teachers; (2) trust has a positive direct effect on teachers' Organizational Citizenship Behavior; (3) organizational commitment has a positive direct effect on the Organizational Citizenship Behavior of teachers; (4) procedural justice has a positive direct effect on teacher organizational commitment; (5) trust has a positive direct effect on teacher organizational commitment. Teachers' organizational citizenship behavior problem is a problem that should get serious attention. The more procedural justice in schools and the strength of good trust, and the higher the level of organizational commitment, the more organizational citizenship behavior of private high school teachers in Bekasi District will increase. Therefore, it is necessary to make efforts to increase procedural justice, increase trust, and increase organizational commitment by paying attention to the indicators that give the most significant influence on other indicators.

VI. ETHICAL CLEARANCE

Ethical clearance for this study was gained from Educational Management Postgraduate Program of Universitas Negeri Jakarta, Indonesia.

VII. RESOURCES OF FUNDINGS

Self-funded.

VII. CONFLICT OF INTEREST

Nil.

REFERENCES

- Andre, Rae. *Organizational Behavior: An Introduction to Your Life in Organizations*, New Jersey: Pearson International Edition, 2008
- Colquitt, LePine, Wesson, *Organizational Behavior, Improving Performance and Commitment in the Workplace, Second Edition*, New York: McGraw-Hill: 2011
- Eran Vigoda-Gadot and Amos Drory. *Handbook of Organizational Politics,* Massachusetts: Edward Elgar Publishing. Inc. 2006
- Gerald Greenberg, *Managing Behavior in Organizations,* New Jersey: Pearson, 2012
- Ivancevich, Konopaske, Matteson, *Organizational Behavior and Management, Eighth Edition,* New York: McGraw-Hill Irwin, 2008
- Kreitner, Kinicki, *Organizational Behavior,* New York: McGraw-Hill, 2010
- Luthans, Fred. *Organizational Behavior, Eleventh Edition,* New York, McGraw-Hill, 2008
- McShane, Von Glinow, *Organizational Behavior, Fourth Edition,* New York, Mc Graw-Hill: 2008
- Newstrom, John W. *Organizational Behavior: Human Behavior at Work,* New York: International Edition; McGraw-Hill/Irwin, 2007
- Schermerhorn. Jhon. R, James G. Hunt, Richard Osborn, Mary Uhl Bien, *Organizational Behavior,* United States of America: Jhon Wiley & Sons, 2011
- Steve, M. Jex, Thomas W. Britt, *Organizational Psychology, A Scientist Practitioner Approach, Second Edition,* New Jersey, Jhon Wiley & Sons, Inc: 2008
- Stephen P. Robbins, Timothy A. Judge, *Organizational Behavior,* New Jersey: Pearson, 2009
- Suzanne C. De janasz, Karen O. Dowd, Ph.D., Beth Z. Scheineider, MBA., *Interpersonal Skills in Organizations*, New York: McGraw-Hill, 2009
- Slocum, Jhon, W. Jr, Don Hellriegel, *Fundamentals of Organizational Behavior,* USA: Thomson Shout Western, 2007
- Phillips, Gully, *Organizational Behavior, Toos for Success,* United State of America, South-Western Cengage Learning: 2012

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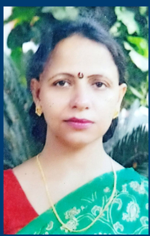

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ABOUT THE BOOK

COVID-19 pandemic has significantly disrupted every aspect of human life. As the COVID-19 spread across the globe, alarm bells are sounding in the education sector. The Covid-19 pandemic has forced research and academic institutions to shut down temporarily and is causing havoc in the education system. The issue of the COVID-19 and its impact on research and higher education is an emergent focus of debate worldwide. Closing universities and cancelling research activities have become a COVID-19 reality in many countries of the world, leading to enormous anxiety and uncertainty. The purpose of this edited book is to investigate the impact of COVID-19 on multidisciplinary research and higher education. Efforts have been made by this edited volume to identify and investigate the challenges that presently our research and higher education systems are facing due to COVID-19 disruption. The opportunities have been explored for the future of global research and higher education in the post-COVID-19 world.

This edited book has provided a critical reflection on the opportunities and challenges for internationalization and will focus on how research and higher education systems across the globe learnt from each other to address new challenges of COVID-19. This book will serve as an opportunity for multidisciplinary researchers, teachers, educators, research scholars and practitioners to reconsider and imagine the work of comparative and international higher education on our campuses. This book will respond to the emergent necessitate for new insights and perspectives to get better research and higher education policy and practice in the era of COVID-19. By keeping this view in mind, we have decided to go for this edited book titled "**Multidisciplinary Researches during Covid Era**"

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