Online ISSN : 0975-4172
Print ISSN : 0975-4350

Global Journal

of Computer Science and Technology: H

Information & Technology

Highlights

- Angle Modulated Signals
- Character Education Development
- Cybercrime Activities
- Students' in Tertiary Institutions

Discovering Thoughts, Inventing Future

VOLUME 15 ISSUE 3 VERSION 1.0

Global Journal of Computer Science and Technology: H
Information & Technology

Global Journal of Computer Science and Technology: H
Information & Technology

Volume 15 Issue 3 (Ver. 1.0)

Open Association of Research Society

Incorporation No.: 0423089
License No.: 42125/022010/1186
Registration No.: 430374
Import-Export Code: 1109007027
Employer Identification Number (EIN):
USA Tax ID: 98-0673427

Global Journals Inc.

*(A Delaware USA Incorporation with "Good Standing"; **Reg. Number: 0423089**)*

Sponsors: *Open Association of Research Society*
Open Scientific Standards

Publisher's Headquarters office

Global Journals Headquarters
301st Edgewater Place Suite, 100 Edgewater Dr.-Pl,
Wakefield MASSACHUSETTS, Pin: 01880,
United States of America
USA Toll Free: +001-888-839-7392
USA Toll Free Fax: +001-888-839-7392

Offset Typesetting

Global Journals Incorporated
2nd, Lansdowne, Lansdowne Rd., Croydon-Surrey,
Pin: CR9 2ER, United Kingdom

Packaging & Continental Dispatching

Global Journals
E-3130 Sudama Nagar, Near Gopur Square,
Indore, M.P., Pin:452009, India

Find a correspondence nodal officer near you

To find nodal officer of your country, please email us at *local@globaljournals.org*

eContacts

Press Inquiries: *press@globaljournals.org*
Investor Inquiries: *investors@globaljournals.org*
Technical Support: *technology@globaljournals.org*
Media & Releases: *media@globaljournals.org*

Pricing (Including by Air Parcel Charges):

For Authors:
22 USD (B/W) & 50 USD (Color)
Yearly Subscription (Personal & Institutional):
200 USD (B/W) & 250 USD (Color)

Integrated Editorial Board
(Computer Science, Engineering, Medical, Management, Natural Science, Social Science)

Dr. Bart Lambrecht
Director of Research in Accounting and FinanceProfessor of Finance
Lancaster University Management School
BA (Antwerp); MPhil, MA, PhD (Cambridge)

Dr. Carlos García Pont
Associate Professor of Marketing
IESE Business School, University of Navarra
Doctor of Philosophy (Management), Massachusetts Institute of Technology (MIT)
Master in Business Administration, IESE, University of Navarra
Degree in Industrial Engineering, Universitat Politècnica de Catalunya

Dr. Fotini Labropulu
Mathematics - Luther College
University of ReginaPh.D., M.Sc. in Mathematics
B.A. (Honors) in Mathematics
University of Windso

Dr. Lynn Lim
Reader in Business and Marketing
Roehampton University, London
BCom, PGDip, MBA (Distinction), PhD, FHEA

Dr. Mihaly Mezei
ASSOCIATE PROFESSOR
Department of Structural and Chemical Biology, Mount Sinai School of Medical Center
Ph.D., Etvs Lornd University
Postdoctoral Training,
New York University

Dr. Söhnke M. Bartram
Department of Accounting and FinanceLancaster University Management SchoolPh.D. (WHU Koblenz)
MBA/BBA (University of Saarbrücken)

Dr. Miguel Angel Ariño
Professor of Decision Sciences
IESE Business School
Barcelona, Spain (Universidad de Navarra)
CEIBS (China Europe International Business School).
Beijing, Shanghai and Shenzhen
Ph.D. in Mathematics
University of Barcelona
BA in Mathematics (Licenciatura)
University of Barcelona

Philip G. Moscoso
Technology and Operations Management
IESE Business School, University of Navarra
Ph.D in Industrial Engineering and Management, ETH Zurich
M.Sc. in Chemical Engineering, ETH Zurich

Dr. Sanjay Dixit, M.D.
Director, EP Laboratories, Philadelphia VA Medical Center
Cardiovascular Medicine - Cardiac Arrhythmia
Univ of Penn School of Medicine

Dr. Han-Xiang Deng
MD., Ph.D
Associate Professor and Research
Department Division of Neuromuscular Medicine
Davee Department of Neurology and Clinical NeuroscienceNorthwestern University
Feinberg School of Medicine

Dr. Pina C. Sanelli
Associate Professor of Public Health
Weill Cornell Medical College
Associate Attending Radiologist
NewYork-Presbyterian Hospital
MRI, MRA, CT, and CTA
Neuroradiology and Diagnostic Radiology
M.D., State University of New York at Buffalo,School of Medicine and Biomedical Sciences

Dr. Roberto Sanchez
Associate Professor
Department of Structural and Chemical Biology
Mount Sinai School of Medicine
Ph.D., The Rockefeller University

Dr. Wen-Yih Sun
Professor of Earth and Atmospheric SciencesPurdue University Director
National Center for Typhoon and Flooding Research, Taiwan
University Chair Professor
Department of Atmospheric Sciences, National Central University, Chung-Li, TaiwanUniversity Chair Professor
Institute of Environmental Engineering, National Chiao Tung University, Hsin-chu, Taiwan.Ph.D., MS The University of Chicago, Geophysical Sciences
BS National Taiwan University, Atmospheric Sciences
Associate Professor of Radiology

Dr. Michael R. Rudnick
M.D., FACP
Associate Professor of Medicine
Chief, Renal Electrolyte and Hypertension Division (PMC)
Penn Medicine, University of Pennsylvania
Presbyterian Medical Center, Philadelphia
Nephrology and Internal Medicine
Certified by the American Board of Internal Medicine

Dr. Bassey Benjamin Esu
B.Sc. Marketing; MBA Marketing; Ph.D Marketing
Lecturer, Department of Marketing, University of Calabar
Tourism Consultant, Cross River State Tourism Development Department
Co-ordinator , Sustainable Tourism Initiative, Calabar, Nigeria

Dr. Aziz M. Barbar, Ph.D.
IEEE Senior Member
Chairperson, Department of Computer Science
AUST - American University of Science & Technology
Alfred Naccash Avenue – Ashrafieh

Contents of the Issue

Global Journal of Computer Science and Technology: H Information & Technology
Volume 15 Issue 3 Version 1.0 Year 2015
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 0975-4172 & Print ISSN: 0975-4350

The Extent of Involvement in Cybercrime Activities among Students' in Tertiary Institutions in Enugu State of Nigeria

By Odo, Chinasa R & Odo, A. I.
Enugu State College of Education Technical Enugu, Nigeria

Abstract- The researcher investigated the extent of involvement in Cybercrime activities among students' in tertiary institutions in Enugu state of Nigeria using cross sectional survey design. Questionnaires were used for data collection. A sample of 175 students was drawn from a population of 18,340 final year students in higher institutions in Enugu State using cluster sampling procedure. The instrument contains 12 items with 4 point scale of Most-times, Sometimes, Seldom and Never. The findings showed that students of higher institutions in Enugu state are involved in cybercrime. It also showed that students' involvement in cybercrime is dependent on gender and Institution type. The implication of the finding for knowledge and development is that the present level of students' involvement in cybercrime has a negative effect on the value of education and by extension, has lead to the setback in economic development of the State. It was recommended that government should empower the law enforcement agencies to checkmate and deal with perpetrators of cybercrime.

Keywords: *cybercrime, phishing, stalking, tertiary-institution.*

GJCST-H Classification: *K.4.1*

Strictly as per the compliance and regulations of:

The Extent of Involvement in Cybercrime Activities among Students' in Tertiary Institutions in Enugu State of Nigeria

Odo, Chinasa R[α] & Odo, A. I.[σ]

Abstract- The researcher investigated the extent of involvement in Cybercrime activities among students' in tertiary institutions in Enugu state of Nigeria using cross sectional survey design. Questionnaires were used for data collection. A sample of 175 students was drawn from a population of 18,340 final year students in higher institutions in Enugu State using cluster sampling procedure. The instrument contains 12 items with 4 point scale of Most-times, Sometimes, Seldom and Never. The findings showed that students of higher institutions in Enugu state are involved in cybercrime. It also showed that students' involvement in cybercrime is dependent on gender and Institution type. The implication of the finding for knowledge and development is that the present level of students' involvement in cybercrime has a negative effect on the value of education and by extension, has lead to the setback in economic development of the State. It was recommended that government should empower the law enforcement agencies to checkmate and deal with perpetrators of cybercrime.

Keywords: *cybercrime, phishing, stalking, tertiary-institution.*

I. Introduction

The technological advancement in cyber space has made computer an integral component in national development. Criminal activities within the cyberspace are now on a global scale. Olaide and Adewole (2004) noted that most of the criminal activities in Nigeria are carried out by the youth. Therefore, it has become imperative to assess the extent of students' involvement in this type of criminal activity. However, if the youths are given the required academic training, the knowledge received will be channeled towards the development of the country. As noted by the National policy on education (2005), that no nation can rise above the quality of its education system.

Tertiary education in Nigeria comprises of undergraduate, and post graduate, and vocational training. Usually, an individual needs to be admitted into a college, polytechnic or university to receive tertiary education. It is the most specialized form of education where an individual takes a particular course of study. On completion of the course, the individual receives an academic degree, diploma or certificate that will help such an individual to be a better human being. The apparent gap between what is acquired in school and the reality of the workspace has been largely attributed to poor learning condition. No wonder education in Nigeria is for those who cannot afford functional education overseas. The breakdown in the quality of education, has led youths to unusual behaviours and the reason why students engage themselves in Cybercrimes.

Cybercrime refers to any form of crime committed by any individual through the use of a computer and network (Mattew, 2010). Debarati and Jaishankar (2011) define cybercrimes as offences that are committed against individuals or groups of individuals with a criminal motive to intentionally harm the reputation of the victim or cause physical or mental harm to the victim directly or indirectly, using modern telecommunication networks such as Internet (Chat rooms, emails, notice boards and groups), and mobile phones (SMS/MMS). Computer related harassment as defined in the U.S. computer statutes is a situation where an individual use a computer or computer network to communicate indecent language, or make any suggestion or proposal of that nature, or threaten any illegal or immoral act. Several techniques used by cyber criminals have been identified – phishing, stalking, etc.

Markus and Steven (2007) defined phishing as a form of social engineering in which an attacker, also known as a phisher, attempts to fraudulently retrieve legitimate users' confidential or sensitive credentials by mimicking electronic communications from a trustworthy or public organization in an automated fashion. Also, Wikipedia (2014) noted that phishing is the attempt to acquire sensitive information such as usernames, passwords, and credit card details (and sometimes, indirectly, money) by masquerading as a trustworthy entity in an electronic communication. Communications purporting to be from popular social web sites, auction sites, banks, online payment processors or IT administrators are commonly used to lure unsuspecting public. Phishing is typically carried out by email spoofing or instant messaging, and it often directs users to enter details at a fake website whose look and feel are almost

Author α : Department of Computer Science, Enugu State College of Education (Technical) Enugu, Nigeria. e-mail: nasamail4u@yahoo.com
Author σ : Department of Computer Engineering, Enugu State University of Science and Technology, Enugu Nigeria.
e-mail: ikechukwu.odo@esut.edu.ng

identical to the legitimate one. Another form of cybercrime is stalking.

Stalking occurs when one person repeatedly intrudes on another to such an extent that the recipient fears for his or her safety (Mullen, Pathé & Purcell 2009). This involves any form of harassment or threatening of an individual, whether physically or through the use of electronics (unsolicited phone calls, SMS/MMS). Virtually any unwanted contact between two persons that directly or indirectly communicate a threat or place the victim in fear can be considered stalking. Some stalkers develop an obsession for another person with whom they have no personal relationship. When the victim does not respond as the stalker hopes, the stalker may attempt to force the victim to comply by use of threats and intimidation. When threats and intimidation fail, some stalkers turn to violence. Purcell, Pathé & Mullen (2004) explained that stalking occurs if multiple unwanted intrusions persist for a period of two weeks or more.

Since higher institutions are of different types, it is important to know if the type of institution determines students involvement in cybercrime since each institution possesses a unique or peculiar cooperate culture. In Enugu state, there are three major higher institutions (Colleges of education, Polytechnics and Universities). These institutions have different systems of administration and policies. It is also vital to know if gender could be responsible for students' involvement in cybercrime activities. Gender is a biological make up which differentiates individual's responsibility and functions.

a) Statement of the Problem

The Nigerian education system has experienced decades of strike actions at all levels. It is difficult to find an individual that had completed an educational programme without experiencing long strike action. The struggle by the academics to attract the attention of the government to the problems of poor infrastructure, lack or inadequate remuneration for staff has resulted to incessant strikes. One of the direct consequences of poor infrastructure is the inability of the institutions to house their students within the campus. Students now leave outside the school campus unsupervised thereby exposing them to different type of ugly behaviors and peering with bad gangs.

b) Purpose of the Study

The main purpose of this study is to determine the extent of involvement in cybercrime activities among students of tertiary institutions in Enugu state. Specifically, the study tends to determine:

1. The extent at which students involve in stalking.
2. The extent at which students involve in phishing
3. The influence of gender on students' involvement in cybercrime.
4. The influence of institution type on students' engagement in cybercrime.

c) Research Questions

The following research questions guided the study

1. To what extent are students involved in stalking?
2. To what extent are students involved in phishing?
3. What is influence of gender on students' involvement in cybercrime?
4. What is the influence of institution type on students' involvement in cybercrime?

d) Research Hypotheses

The following hypotheses were formulated

HO1: Institution type has no significant influence on student involvement in cybercrime.

HO2: There is no significant difference between male and female students of higher institutions on their involvement in cybercrime activities.

e) Significance of the Study

This study would be of immense benefit to the education system in Enugu state. This comprises of the Ministry of education, the management of tertiary institutions, students and the general public.

The ministry of education, through the findings of this research, would be able to formulate policies and programmes to ensure functional and effective education.

Management of institutions would also find this research interesting because it would enable them design academic activities that would engage students until they finish their academic programmes.

Students would find this work interesting because it would help them understand the consequences of engaging in cybercrime.

The society at large would be more aware of danger of youth involvement in cybercrimes and make adequate effort to impart good moral to their children.

II. Methods

The study adopted cross sectional survey design with a population size of 18,340 students cutting across final year students of colleges of education, polytechnic and universities in Enugu state (i.e. those admitted in the year 2012, 2011, 2011 respectively). The cluster sampling procedure was adopted to draw a sample of 175 students. Each of the five institutions in Enugu state, University of Nigeria, Nsukka (UNN), Enugu State University of Science and Technology (ESUT), Institute of Management and Technology (IMT), Federal College of Education (Eha-Amufu) and Enugu State College of Education Technical (ESCET) that make up the area of study was regarded as a cluster. Eboh (2009) indicated that cluster sampling is suitable for use where the focus of interest is the occurrence of individual events within a particular carefully specified locality. Sampling was done by drawing 35 students

from each cluster using the simple random sampling technique of balloting.

The instrument for data collection was a 12-item questionnaire made up of two sections, A & B. Section A elicited information on the demographic variables of the students while, section B contained 10 item statements with a 4 opinion responses of Most times (MT) Sometimes (ST) Seldom (SD) and Never (NE). Also, section B contained statements that addressed two dimensions of cybercrime (stalking and phishing). Content and face validity of the instrument were established through the judgment of three experts. Reliability of the instrument was done using Split-half method. Twenty copies of the instrument were administered on twenty students in higher institutions in Anambra state. The correlation coefficient of the two sets of scores yielded 0.87 using Cronbach Alpha statistic.

Data analysis was done using mean and standard deviation. The four response options of MT, ST, S and N were weighted 4, 3, 2 and 1 respectively, and coded into the Special Package for Social Sciences (SPSS). A criterion mean of 2.50 was established. Mean responses of 2.50 and above were regarded as high extent while mean responses below 2.50 were regarded as low extent. The t-test and one way ANOVA statistic were employed in verifying the null hypotheses, at 0.05 level of significance.

III. Results

Table 1 : Mean Ratings of the Responses on the Extent at which Students are Involved in Cybercrime Activities N = 175

SN	Items	Mean	SD	Interpretation
3	Use social networking sites and technology to track people	3.17	0.85	High extent
4	Constantly placing unwanted calls to people	3.22	0.86	High extent
5	Send unwanted text messages and email to people	3.37	0.80	High extent
6	Use social networking sites to blackmail people	3.50	0.63	High extent
7	Upload female picture without their consent	2.03	0.94	Low extent
8	Hack into people's personal and sensitive information in internet	3.53	0.56	High extent
9	Use cell phone to bridge into people's privacy	3.14	0.84	High extent
10	Spread computer virus via internet	1.34	0.48	Low extent
11	Use internet to dupe people	3.51	0.69	High extent
12	Use internet to do illegal business	3.39	0.80	High extent
	Grand mean	**3.02**	**0.74**	**High extent**

TABLE one contains the result of the responses on the extent at which students engage in cybercrime activities in higher institutions. The table indicated that students in higher institution do not spread computer virus via the internet or upload female picture without their consent. However, the table shows a high rate of students' involvement in cybercrime with grand mean of 3.02.

Table 2 : Mean Ratings on the Responses on the extent at which students are involved in cybercrime activities based on gender N = 175

SN	Items	Male = 103			Female = 72		
		Mean	SD	Interpretation	Mean	SD	Interpretation
3	Use social networking sites and technology to track people	3.73	0.45	High extent	2.38	0.62	Low extent
4	Constantly placing unwanted calls to people	3.78	0.42	High extent	2.43	0.69	Low extent
5	Send unwanted text messages and email to people	3.92	0.27	High extent	2.57	0.60	High extent
6	Use social networking sites to blackmail people	3.95	0.22	High extent	2.86	0.45	High extent
7	Upload female picture without their consent	2.68	0.65	High extent	1.10	0.30	Low extent
8	Hack into people's personal and sensitive information in internet	3.93	0.25	High extent	2.96	0.31	High extent
9	Use cell phone to bridge into people's privacy	3.73	0.45	High extent	2.31	0.46	Low extent
10	Spread computer virus via internet	1.58	0.50	Low extent	1.00	0.00	Low extent
11	Use internet to dupe people	4.00	0.00	High extent	2.82	0.59	High extent
12	Use internet to do illegal business	3.94	0.24	High extent	2.61	0.66	High extent
	Grand mean	**3.52**	**0.34**	**High extent**	**2.30**	**0.47**	**Low extent**

In the overall TABLE two, the responds shows that male students engage more in cybercrime activities than female with the grand mean of 3.52 for male and 2.30 for female. However, both male and female students do not spread computer virus via internet.

Table 3 : Mean Ratings on the Responses on the Extent at which Students are Involved in Cybercrime Activities based on Institution type N = 175

Items	College of Education = 70			Polytechnics = 35			Universities = 70		
	Mean	SD	Interpretation	Mean	SD	Interpretation	Mean	SD	Interpretation
3	2.36	0.62	Low extent	3.14	0.36	High extent	4.00	0.00	High extent
4	2.41	0.69	Low extent	3.29	0.46	High extent	4.00	0.00	High extent
5	2.54	0.58	High extent	3.74	0.44	High extent	4.00	0.00	High extent
6	2.83	0.42	High extent	3.86	0.36	High extent	4.00	0.00	High extent
7	1.07	0.26	Low extent	2.00	0.00	Low extent	3.00	0.54	High extent
8	2.93	0.26	High extent	3.80	0.41	High extent	4.00	0.00	High extent
9	2.29	0.46	Low extent	3.14	0.36	High extent	4.00	0.00	High extent
10	1.00	0.00	Low extent	1.00	0.00	Low extent	1.86	0.35	Low extent
11	2.79	0.56	High extent	4.00	0.00	High extent	4.00	0.00	High extent
12	2.57	0.63	High extent	3.83	0.38	High extent	4.00	0.00	High extent
Grand mean	2.28	0.45	Low extent	3.18	0.28	High extent	3.69	0.09	High extent

In the overall TABLE three, the responds shows that students in the university and polytechnic engage more in cybercrime activities than those in college of education with the mean rating of 3.69 for university, 3.18 for polytechnic and 2.28 for college of education. Meanwhile, item 10 shows low extent for college of education, polytechnic and university.

Table 4 : Summary of the T-Test Analysis Verifying the Difference Between Male and Female students on their Mean Response on the Extent of their Involvement in Cybercrime activities in Higher Institutions in Enugu State

Gender	N	Mean	SD	Df	t-cal	t-crit	P	Decision
Male	103	3.52	0.34					
				173	18.60	1.96	.05	Reject
Female	72	2.30	0.47					

TABLE 4 the mean ratings of male and female students have been compared using the t-test statistics. The data show that t-cal (18.60) > t-critical table value (1.96), therefore the Ho1 is rejected. Gender has influence on students' involvement in cybercrime activities at .05 level of significance. Male students' involvement in cybercrime activities is more than that of female.

Table 5 : Summary of the ANOVA Statistic Verifying the Difference on Mean Responses of Students Regarding their involvement in Cybercrime activities According to their Institution type

Source	Df	Sum of squares	Mean square	f-cal	f-tab	P	Decision
Between Group	2	76.56	38.28				
				303.27	3.18	.05	Reject
Within Group	172	23.27	0.13				

In TABLE 5, one way ANOVA was applied in analyzing Ho2. The data as contained in Table 5 show that f-cal (303.27) > f-tab (3.18) at .05 level of significance, therefore, therefore Ho2 is rejected. The students' involvement in cybercrime activities is dependent on institution type.

IV. Summary of Findings

1. Students of high institutions in Enugu state are involved in cybercrime activities.
2. Students' involvement in cybercrime activities is dependent on gender. Male students engage more in cybercrime than female students.
3. Also, institution type determines the extent of cyber criminalities engage in by students.

V. Discussion

The study generated information on cybercrime involvement among students' in tertiary institutions in Enugu state. The finding pertaining to research questions 1 and 2 revealed that students engage themselves in cybercrime activities. This finding is not unexpected considering the several breaks within an academic programme occasioned by union strikes. The finding is in line with Odumesi (2014) who observed that cyber criminal activities are common among youths.

The finding pertaining to hypothesis one (Ho1) revealed that student involvement in cybercrime is dependent on gender. Male students engage more in cybercrime than female students. This finding is not unexpected since women are mostly victims, and consistent with the findings of the Association for Progressive Communication (2014), which observed that women are the primary victims of cybercrime, while men are the primary harassers. Encyclopedia (2002) also noted that men have greater involvement in committing crime than women.

The finding pertaining to hypothesis two (Ho2) revealed that students' involvement in cybercrime is dependent on the institution type. This may be attributed to the fact that each institution has its own culture and runs a different kind of academic programme. The finding is in agreement with that of Okeshola and Abimbola (2013) who observed that various forms of cyber criminal activities are being perpetrated in Nigeria tertiary institutions, and this is denting and drilling holes in the economy of the nation.

VI. Implications of the Study on Education and Economy

The situation in most tertiary institutions in Enugu is alarming and cybercrime is just another dimension to it. The youths are the leaders of tomorrow and should be given proper education to be able to channel the energy towards more profitable ventures. Unfortunately, as the study revealed, the system charged with this responsibility has not delivered the goods. More people live in fear of harassment from different sources. This has very serious negative implications on the education of the youth and the economy in genera.

VII. Recommendations

Government should set up a mechanism to track and investigate the menace of cyber criminals within and outside the institutions. After all, majority of undergraduates live within the larger society and it is more difficult to monitor the development of these students. There should be a more proactive approach towards the provision of comfortable accommodation for all the students to guarantee effective training.

Workshops should be organized for the students from time to time on the trends of cyber criminals. By so doing, such crimes could easily be noticed and reported before they escalate to a larger proportion. The academic programme should be such that students are seriously engaged throughout. This can only be achieved through effective collaboration between the management and the labour unions.

References Références Referencias

1. Association for Progressive Communication. Gender centered this month: cybercrime and women. (2014) Retrieved March 26 2015 from http://www.apc.org/en/node/6722
2. Eboh, E. Social and Economic Research: Principles and Methods. 1st edn (2009) African Institute of Enugu . Applied Economics.
3. Encyclopedia. Gender and crime. (2002) Retrieved February 28 2015 from http://www.encyclopedia.com/doc/1G2-3403000129.html.
4. Laughren, J. Cyberstalking Awareness and Education (2000). Retrieved June 13 2014 from http://www.acs.ucalgary.ca/dabrent/380/webproj/jessica.html.
5. Markus, J. and Steven, M. Phishing and countermeasures: understanding the increasing problem of electronic identity theft. (2007) John Wiley & Sons, Inc., New Jersey
6. Matthews, B. Computer Crimes: Cybercrime Information, Facts and Resources. (2010) Retrieved March 23, 2015 from http://www.thefreeresource.com/computer-crimes-cybercrimeinformation-facts-and-resources.
7. Mullen P.E, Pathé M and Purcell R Stalkers and their victims. (2009) Cambridge University Press London.
8. Odumesi, J.O A socio-technological analysis of cybercrime and cyber security in Nigeria. International Journal of Sociology and Anthropology (2014) 6(3), 116-125.
9. Okeshola F.B & Abimbola K.A. The nature, causes and consequences of cybercrime in tertiary institutions in Zaria-Kaduna state of Nigeria. American International Journal of Contemporary Research (2013) 3 (9), 98-114.
10. Olaide and Adewole. Cyber Crime Embarrassing for Victims. (2004) Retrieved September 2014 from h ttp//www.heraldsun.com.au
11. Purcell R, Pathé M & Mullen PE. Stalking: defining and prosecuting a new category of offending. International Journal of Law and Psychiatry (2004a) 2(7), 157–69
12. Purcell R, Pathé M & Mullen PE. Editorial: When do repeated intrusions become stalking Journal of Forensic Psychiatry and Psychology (2004b) 15 (4): 571–834

This page is intentionally left blank

Global Journal of Computer Science and Technology: H Information & Technology
Volume 15 Issue 3 Version 1.0 Year 2015
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 0975-4172 & Print ISSN: 0975-4350

A Novel Classifier for Digital Angle Modulated Signals

By Venkata Krishna Rao M
Vidya Jyothi Institute of Technology, Hyderabad , India

Abstract- The identification of the modulation type of an arbitrary noisy signal is necessary in various applications including signal confirmation, interference identification, spectrum management, electronic support systems in warfare, electronic counter-counter measures etc. In this paper a novel classification scheme based on the variance of instantaneous frequency is proposed to discriminate between noisy M-ary Phase Shift Keyed (MPSK) and M-ary Frequency Shift Keyed (MFSK) signals. In the proposed method, the received signal is passed through a pair of band pass filters and the ratio of variances of instantaneous frequency of the filter outputs is used as a decision statistic. Analytic expressions are developed for the decision statistic. These expressions show that a high degree of discrimination is possible between PSK and FSK signals even at a carrier-to-noise ratio (CNR) of 0 dB. Simulation studies have been carried out and the theoretical predictions are validated.

Keywords: MPSK, MFSK, modulation classification, variance ratio, instantaneous frequency, digital angle modulation.

GJCST-H Classification: H.5.5, C.2.1

Strictly as per the compliance and regulations of:

A Novel Classifier for Digital Angle Modulated Signals

Venkata Krishna Rao M

Abstract- The identification of the modulation type of an arbitrary noisy signal is necessary in various applications including signal confirmation, interference identification, spectrum management, electronic support systems in warfare, electronic counter-counter measures etc. In this paper a novel classification scheme based on the variance of instantaneous frequency is proposed to discriminate between noisy M-ary Phase Shift Keyed (MPSK) and M-ary Frequency Shift Keyed (MFSK) signals. In the proposed method, the received signal is passed through a pair of band pass filters and the ratio of variances of instantaneous frequency of the filter outputs is used as a decision statistic. Analytic expressions are developed for the decision statistic. These expressions show that a high degree of discrimination is possible between PSK and FSK signals even at a carrier-to-noise ratio (CNR) of 0 dB. Simulation studies have been carried out and the theoretical predictions are validated.

Keywords: MPSK, MFSK, modulation classification, variance ratio, instantaneous frequency, digital angle modulation.

I. Introduction

The ability to identify the modulation type of an arbitrary noisy signal is desirable for different reasons like signal confirmation, spectrum management [1], electronic support measures (ESM), electronic counter measures (ECM) in warfare [2], selection of appropriate demodulator in intelligent modems and military threat analysis [3]. In defense applications, the analysis of hostile transmissions is important both for extracting secret messages from communication signals and for implementing counter measures. In spectrum monitoring application, unauthorized transmissions are continuously intercepted and analyzed in a given area and frequency band, to detect the unauthorized ones or deviations in the authorized transmissions and finally deciding on the corrective steps. In either of the above cases and in similar applications, the characteristics of the intercepted signals must be determined and before that the modulation type is to be estimated.

A simple communication signal classifier comprises a bank of demodulators, each designed for only one type of modulation of the received signal [4]. An operator examining the demodulators' outputs could identify the type of modulation of the received signal.

Author: Vidya Jyothi Institute of Technology, Hyderabad , India.
e-mail: mvk_rao@hotmail.com

The obvious disadvantages of manual mode can be alleviated by the machine-based modulation classification techniques. More over such automatic classification techniques are to be invariably used in real time systems in modern warfare, surveillance and in situations where the signals are available only for short durations. Liedtke [5] and Jondral [6] used pattern recognition techniques for Classification of modulated signals which require large amounts of data to train the classifier. Dominguez et.al. [7] and Hagiwara et.al. [8] used histograms of instantaneous envelope and modulation indices respectively for classification purpose. However, none of these have the necessary analytical support. Further, the required carrier-to noise ratio (CNR) for correct classification is greater than 15 dB. In a recent paper [9], an autoregressive (AR) model applied on the instantaneous frequency has been proposed for the classification of PSK and FSK signals. However, this technique requires a CNR of 15dB or more, and is also limited to binary PSK and binary FSK (i.e. M=2) only. In another recent paper [10], higher order cumulants and moments (up to eighth order) were proposed as features in combination with a support vector machine (SVM) classifier to classify MPSK signals for M=2, 4, 8 along with quadrature amplitude modulated (QAM) signals at as low as CNR of 3 dB. The genetic algorithm (GA) was used here for the optimal design of the classifier. However, the FSK signals were not considered and the computation complexity is very high. In [11] modulation classification based on wavelet and fractional fourier transform was proposed but the technique is limited to 2PSK and 2FSK only.

In this paper, a simple but powerful technique for distinguishing between the digital angle modulated signals, that is between MPSK and MFSK signals is proposed. The method is based on the variance ratio of instantaneous frequency of the received signal passed through a pair of concentric band pass filters. The center frequencies of the filters are automatically determined from the short time fourier transform (STFT) analysis. The analytical expressions for the variance of instantaneous frequency of both MPSK and MFSK signals are derived. The expression for the variance ratio of filter outputs is also analytically obtained and is used as the decision statistic. Extensive simulations to validate the proposed method are carried out and the results are in close agreement with the theoretical predictions.

The paper is organized as follows. In section II, derivation of analytical expressions of variances is presented. In section III, the expression for the proposed decision statistic is derived. The algorithm for the proposed novel classifier is presented in section IV. In section V, details of simulations and the results are presented. Finally concluding remarks and scope of future work are presented in Section VI.

II. Instantaneous Frequency of MFSK and MPSK Signals

In this section, analytical expressions for instantaneous frequency of a noisy sine wave derived by Rice [12] are adapted to obtain expressions for the statistics of instantaneous frequency of PSK and FSK signals.

Consider a noisy sine wave given by

$$s(t) = \mathrm{A}\cos 2\pi f_c\ t + n(t) \tag{1}$$

where *n(t)* is a zero mean band pass white noise with one sided power spectral density η . The instantaneous phase $\emptyset_i(t)$, the instantaneous angular frequency $\omega_i(t)$ and the instantaneous linear frequency $f_i(t)$ of *s(t)* is given by

$$\emptyset_i(t) = \tan^{-1}\frac{\hat{s}(t)}{s(t)};\ \omega_i(t) = \frac{d\emptyset_i(t)}{dt};$$

$$f_i(t) = \frac{1}{2\pi}\frac{d\emptyset_i(t)}{dt} \tag{2}$$

where $\hat{s}(t)$ is the Hilbert transform of the signal s(t). Rice [12] showed that the probability density function of angular frequency $\omega_i(t)$ is given by

$$p(\omega_i) = \frac{1}{2}\sqrt{\frac{\sigma_n}{\sigma_{n'}}}\,(1+z^2)^{-\frac{3}{2}}\,e^{-\gamma+\frac{y}{2}}$$

$$\left[(1+y)I_0\left(\frac{y}{2}\right) + yI_0\left(\frac{y}{2}\right)\right] \tag{3}$$

where

$$z^2 = \frac{\sigma_n}{\sigma_{n'}}\,{\omega_i}^2;\quad \gamma = \frac{A^2}{2\eta B}\quad and\quad y = \frac{\gamma}{1+z^2} \tag{4}$$

and I_0 and I_1 are Bessel functions of first the kind, B is the bandwidth of an ideal band pass filter, ${\sigma_n}^2$ and ${\sigma_{n'}}^2$ the variances of the noise and its time derivative respectively and finally γ is the carrier-to-noise ratio (CNR). At high and moderate CNRs, this density approaches gaussian function with a mean of $2\pi f_c$ and variance given by

$${\sigma_{\omega_i}}^2 = \frac{\pi^2\eta B^2}{3A^2} \tag{5}$$

which can be obtained in terms of CNR as

$${\sigma_{\omega_i}}^2 = \frac{\pi^2 B^2}{6\gamma} \tag{6}$$

It is easy to see that the mean and variance of instantaneous linear frequency can be respectively written as

$$\mu_{f_i} = f_c \tag{7}$$

$${\sigma_{f_i}}^2 = \frac{B^2}{24\gamma} \tag{8}$$

In MFSK systems, the frequency of the carrier is allowed to take one of M possible values, the transmitted waveform corresponding to any one of the M symbols is given by

$$s_k(t) = Acos(2\pi f_k t) = Acos\{2\pi(f_c + if_d)t$$

$$i = \pm1, \pm2, \ldots, \pm(M-1) \tag{9}$$

The instantaneous frequency is constant within a given symbol but its value changes from symbol to symbol. But, in general, the instantaneous phase is continuous across the symbols as in case of continuous phase frequency shift keying (CPFSK). Within a given symbol the FSK signal is same as the single tone signal with a carrier frequency corresponding to that symbol. If the signal is contaminated by additive gaussian noise, the instantaneous frequency of the carrier within this symbol interval has gaussian density with variance given by eq.(8). Thus the probability density function of the instantaneous frequency of an MFSK signal becomes multimodal as given by

$$p_{xMFSK}(f_i) = \frac{1}{M}\sum_{k=1}^{M} N\left(\mu_k(M), \sigma_k(M)\right) \tag{10}$$

where

$$\mu_k(M) = f_c + (2k-1-M)\frac{f_d}{2}\ and\ {\sigma_k}^2 = \frac{B^2}{24\gamma} \tag{11}$$

One may note that the noisy MFSK signal can be treated as a signal formed by interleaving the random vectors $S_k(t)\ i = 1,2,\ldots,M-1$of individual symbols. Expressions for the mean and variance of such a random vector are derived from the mean and variance of the component random vectors in Appendix A. From the results of the Appendix A, we get

$$\mu_{f_{i(M)}} = f_c \tag{12}$$

$${\sigma_{f_i}}^2(M) = \frac{1}{M}\sum_{k=1}^{M}{\sigma_k}^2(M) + \frac{1}{M}\sum_{k=1}^{M}{\mu_k}^2(M)$$

$$-\frac{1}{M^2}\sum_{k=1}^{M}\sum_{l=1}^{M}\mu_k(M)\mu_l(M) \tag{13}$$

For a given f_d and γ eq.(13) is a monotonic increasing function of M, the number of frequency states.

In M-ary PSK systems, the phase of carrier is allowed to take one of M possible values. However, the instantaneous frequency of this waveform is constant except at the phase transitions where it is theoretically infinite. If the signal is discrete in time, the instantaneous frequency at the phase transitions can not take infinite value but it does attain a very large value. In the presence of additive gaussian noise the instantaneous linear frequency assumes gaussian density with a mean and variance given by eq.(7) and eq.(8) respectively. Note that substituting M=1 (for a sine wave signal) in eq.(12) and eq.(13), and using eq.(11) we get the eq.(8).

In the section to follow, we derive a decision statistic based on variance of instantaneous frequency MPSK and MFSK signals.

III. Discrimination Between MPSK and MFSK Signals

Consider the eq. (12) which gives the variance of instantaneous frequency $\sigma_{f_i}{}^2(M)$ of a noisy MFSK signal. From this equation, we note that the variance is a function of the CNR (γ), frequency deviation f_d and the number of frequency states M. As explained earlier, the variance $\sigma_{f_i}{}^2(M)$ is a monotonic function of M and hence $\sigma_{f_i}{}^2(M1) < \sigma_{f_i}{}^2(M)$ for $M>1$.

From the eq.(6), we note that the variance of instantaneous frequency of MPSK signals is a function of CNR (γ). To illustrate the nature of dependence of variances of f_i for both MPSK and MFSK, a plot of $\sigma_{f_i}{}^2(M)$ as a function of γ for a bit rate r_b=250bps and a frequency deviation f_d=500Hz and is shown in Fig 1a. From this plot we note that the variances $\sigma_{f_i}{}^2(M)$ are quite different for MPSK and MFSK signals and it is possible to discriminate these two types of modulations. However, since these variances change as a function of CNR and in a real world scenario we have no apriori knowledge of the available CNR, it is preferable that the decision statistic be independent of CNR. In what follows a technique to eliminate this dependence is presented.

Consider a pair of concentric band pass filters having bandwidths B_1 and B_2 ($B_2 = K B_1$; K being a real number greater than unity). Let the received signal be passed through these filters. The variance of instantaneous frequency of a MPSK signal at the output of these filters can be obtained from eq.(8) as

$$\left(\sigma_{f_i}{}^2\right)_1^{PSK} = \frac{B_1{}^2}{24\gamma_1}; \quad \left(\sigma_{f_i}{}^2\right)_2^{PSK} = \frac{B_2{}^2}{6\gamma_2} \tag{14}$$

where γ_1 and γ_2 are the CNRs at the output of the filters of bandwidths B_1 and B_2 respectively. We note that $\gamma_1 = \gamma_2/K$, if $B_2 = KB_1$. Thus the variance expressions reduce to

$$\left(\sigma_{f_i}{}^2\right)^{PSK} = \frac{B_1{}^2}{24\gamma_1}; \quad \left(\sigma_{f_i}{}^2\right)_2^{PSK} = \frac{K^3 B_1{}^2}{24\gamma_1} \tag{15}$$

The above equation suggests that by forming a ratio of variances, we get a parameter that becomes independent of γ for MPSK signal, which is given by

$$R_{PSK} = \frac{\left(\sigma_{f_i}{}^2\right)^{PSK}}{\left(\sigma_{f_i}{}^2\right)^{PSK}} = K^3 \tag{16}$$

An additional advantage is that the ratio can be set by choosing an appropriate value of K.

Now, let us consider the ratio of variances for the case of MFSK signals. Using eq.(13) for the $\sigma_{f_i}{}^2(M)$ of FSK at two different bandwidths and after some algebraic manipulation, we obtain the ratio as

$$R_{FSK} = \frac{K^3 + \beta}{\beta + 1} \tag{17}$$

where

$$\beta = \frac{2\, f_d{}^2\, (M^2 - 1)\gamma_1}{B_1{}^2} \tag{18}$$

which obviously has a dependence on CNR(γ) and the frequency deviation f_d. The bandwidth B_1 must be selected in such a way that signal components of the received signal are not lost or highly attenuated and at the same time keeping the noise entering the filter as low as possible. One of the ways for choosing appropriate B_1 is to identify the significant portion of the spectrum by any one of the spectral estimation methods and choose B_1 so as to pass the significant portions. From the power spectra of MFSK signals [13] it is easy to arrive at the required bandwidth of the filter B_1 as

$$B_1 = (M + 2) f_d \tag{19}$$

Substituting eq.(19) in eq.(18) we get

$$R_{FSK} = \frac{2\,(M^2 - 1)\gamma_1}{(M + 2)^2} \tag{20}$$

Thus, for appropriately chosen filter bandwidth, R_{FSK} is independent of f_d. To illustrate the behavior of R_{FSK}, both R_{FSK} and R_{PSK} are plotted as a function of γ and M, for K=1.5 and f_d =500Hz in Fig 1b. From these plots we note that one can set a threshold of T_H (here it is 3)

on the decision static to discriminate between MPSK and MFSK signals up to a CNR as low as 0dB.

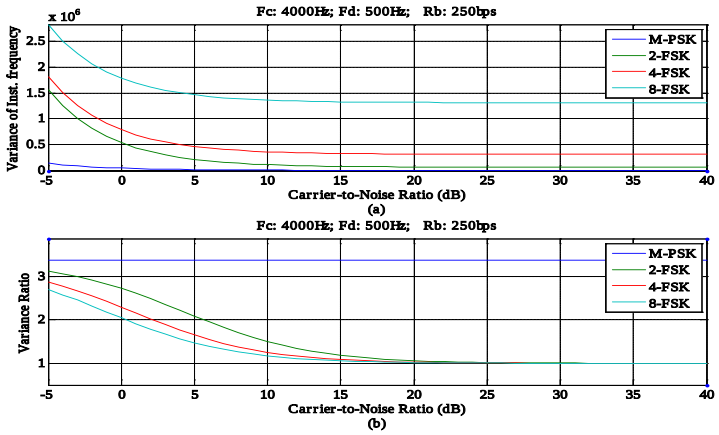

Figure 1: Theoretical Curves for (a). Variance of Instantaneous Frequency (MPSK & MFSK) (b). Variance Ratio of Instantaneous Frequency (MPSK & MFSK). Possible threshold could be 3 for classifying the MPSK and MPSK signals.

IV. Proposed Novel Classifier

Though the analytical expressions for the variance Ration *R* are very promising for classification of digital angle modulated signals, some practical issues hamper the effectiveness of the classifier at the low CNRs. As mentioned earlier, the instantaneous frequency of MPSK signal will have spikes at phase transitions. The variance expressions derived earlier do not take this in to account. Thus, while implementing the proposed method, these spikes have to be suppressed. For the elimination of spikes in the instantaneous frequency, an impulse elimination filter which does not effect the flat portion of the instantaneous frequency is to be used. One of the simplest methods used for such purposes is the median filter. A median filter [14] of a size N_w samples can suppress all the spikes having width of less than or equal to N_w.

Thus the proposed algorithm for discriminating MPSK and MFSK modulated signals can be stated as follows.

Step1: Compute the averaged short time fourier transform (STFT) of the given noisy modulated signal *s(t)*.

Step 2 : Using threshold and peak detection algorithm identify the spectral band of signal activity.

Step3 : Estimate the approximate centroid and bandwidth of the above identified signal band. Call them as $\widehat{f_c}$ and $\widehat{B_1}$

Step 4 : Design a band pass filter centered at $\widehat{f_c}$ and having a bandwidth $\widehat{B_1}$.

Step 5 : Design a second band pass filter centered at $\widehat{f_c}$ and having a bandwidth $\widehat{B_2}$.

Step 6 : Pass the noisy modulated signal *s(t)* through the two band pass filters separately. Let the output signals be $y_1(t)$ and $y_2(t)$ respectively.

Step 7 : Compute the analytical envelopes of the outputs of both the band pass filters.

Step8 : Compute the instantaneous frequencies of both analytical envelopes.

Step9 : Remove the spikes in the instantaneous frequencies using a median filter of size N_w.

Step 10 : Estimate the variances $(\widehat{\sigma_{f_i}}^2)_1$ and $(\widehat{\sigma_{f_i}}^2)_2$ of the median filtered instantaneous frequencies.

Step11 : Compute the variance ratio $(\widehat{\sigma_{f_i}}^2)_2/(\widehat{\sigma_{f_i}}^2)_1$.

Step12 : Classify the signal as MPSK signal, if the variance ratio is greater than a threshold T_H, else classify it as MFSK signal.

V. Simulation and Results

To ascertain the theoretical predictions of the earlier sections, extensive computer simulations for discriminating between MPSK and MFSK signals were carried out. In these simulations, a random symbol sequence of length 128 with equal probability is taken as the message data. First $M \times 128$ random bits are generated and then each set of M bits is converted into a symbol, thus making a total of 128 symbols. Thus for M=2, each bit is taken a symbol, while for M=3, each set of 3 bits makes a symbol. A bit rate (r_b) of 250 bps, a carrier frequency (f_c) of 4000Hz are used for generating MPSK or MFSK signals. A frequency deviation (f_d) of 500Hz is used in case of the MFSK signal. A sampling frequency (f_s) of 22 KHz is used in all simulations.

The MPSK signals were generated using

$$s(t) = A\cos(\omega_c t + \varphi_0 + \varphi_k) \qquad (21)$$

where $\varphi_k = \frac{2\pi i}{M}$; $i = 0,1,\ldots,M-1$ and the continuous phase MFSK signals were obtained from

$$s(t) = A\cos\left(2\pi\left(f_c + (2k-1-M)\frac{f_d}{2}\right)t + \varphi_0\right) \quad (22)$$

The initial phase $\varphi_0$is set to be zero for simplicity. A zero mean white gaussian noise (WGN) of variance $(\sigma_w{}^2)$ were added to form the noisy versions of these signals. The variance $\sigma_w{}^2$ of the noise is chosen so as to give the required Carrier-to-Noise Ratio (γ). Simulations are carried out for γ of 30dB, 20dB, 10dB, 5dB, 3dB and 0dB.

The proposed novel classifying algorithm is applied on the noisy signals. First the signal activity band of the noisy signal is identified by the STFT analysis done by a customized matlab function *mySTFTanalysis()*. The band width of the signal is maximum for 8FSK signal and is found to be 2250Hz approximately which is nine times the bit rate, for the frequency deviation of 500Hz. For PSK signal bandwidth is almost constant and is around 500Hz, which is close to the theoretical value of $2r_b$. The estimated spectral centroid $\hat{f}_c$ is around 4000Hz, close to theoretical value of f_c. The spectral centroid estimation is done by an algorithm described in [16]. The bandwidth including the first side lobe is found to be equal to the symbol rate i.e. 250Hz, 125Hz and 166Hz corresponding to M=2,3 and 4 respectively.

The noisy signal is filtered using a pair of concentric band pass filters centered on $\hat{f}_c$ and having bandwidths B_1. These filters are implemented as 6-th order type I chebyshev filters with a pass band ripple (δ) of 40dB or maximally flat butterworth filters. The ratio of bandwidths K is set at 1.5.

An analytical envelope $s(t) + j\,\hat{s}(t)$ computed for the output of each band pass filter. The hilbert transform $\hat{s}(t)$ is obtained by using a customized matlab function *myHilbert()*. Then, instantaneous frequency is estimated using the eq.(2) and median filtered to eliminate the spikes at the phase transitions that occur at the symbol boundaries. The size of the median filter is set as 5 samples. The variances of the median filtered instantaneous frequencies $\left(\widehat{\sigma_{f_i}}^2\right)_1$and $\left(\widehat{\sigma_{f_i}}^2\right)_2$were computed as the unbiased sample variances. From these the estimate of the variance ratio $\hat{R}$ is obtained.

The noisy PSK and FSK signals are simulated as several realizations of random message bits and an additive gaussian noise. Here 128 random realizations of each modulated signals are carried out. Thus for M=2,3,4 (3 cases), for CNR=30dB, 20dB, 10dB, 5dB, 3dB and 0dB (6 cases), for PSK and FSK modulations (2 cases) and for 128 realizations (128 cases), a total of $3 \times 6 \times 2 \times 128 = 4608$ noisy modulated signals are generated.

In what follows, the results of the simulations are presented in detail from Fig.2 through Fig 11. Fig.2 and Fig.3 give the averaged short time fourier transform (STFT) of noisy MPSK and MFSK signals respectively. From these spectrum plots, the band of signal activity can be determined in each case. Here, the band containing the main lobe and one side lobe on either side of main lobe is considered as the bandwidth of the MPSK/MFSK signals. Thus from Fig 2a, the bandwidth of 2PSK is found to be 1000Hz. This value is determined automatically by peak detection and threshold process applied on the spectrum. Similarly it is found to be 500Hz and 330Hz for 4PSK and 8PSK signals respectively from Fig 2b and 2c Similar the bandwidths 3000Hz and 5000Hz for M=2,4 and 8 respectively from for MFSK signals are estimated to be 2000Hz, Fig 3. These values are set to B_1 of the first band pass filter and signal is processed. At the output of the filter the analytical envelope and the instantaneous frequency is found in each case. The instantaneous frequency is passed through a median filter of size 15. Figs 4, 5 and 6 give the instantaneous frequency at the band pass filter output, its histogram, instantaneous frequency at the median filter output and its histogram for 2PSK, 4PSK and 8PSK signals respectively. It may be observed that the zero values frequently appearing in the instantaneous frequency are actually the artifacts. The spike at the 0 in the histogram of the instantaneous frequency corresponds to these artifacts. In computations and in plotting, these artifacts are avoided by replacing them with *NaN*. Matlab does not show these points in the instantaneous frequency plots and hence the gaps in the plots. The instantaneous frequency and corresponding histograms for MFSK signals are shown in Figs 7, 8 and 9 for M=2,4 and 8 respectively. Please note that in these figures each frequency state appears as a Gaussian shaped hump in the composite histogram. The variance or spread of these Gaussian shaped humps reduces after median filtering clearly bringing out the M frequency states in the histogram even at low CNRs.

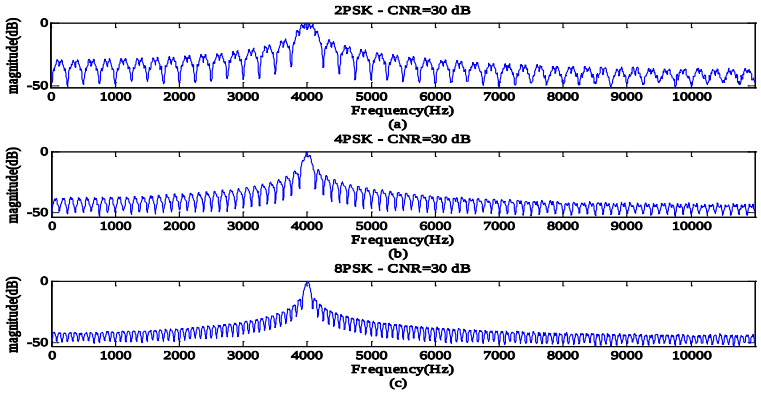

Figure 2 : The averaged short time fourier transform (STFT) of noisy (a).2PSK signal (b). 4PSK signal (c). 8PSK signal (CNR=30dB)

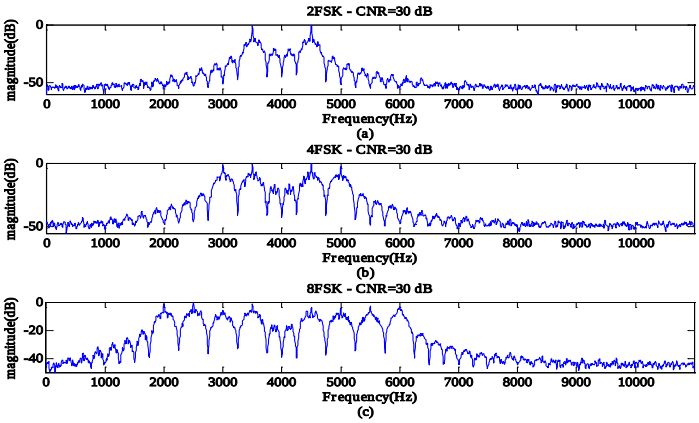

Figure 3 : The averaged short time fourier transform (STFT) of noisy (a). 2 FSK signal (b). 4FSK signal (c). 8FSK signal (CNR=30dB)

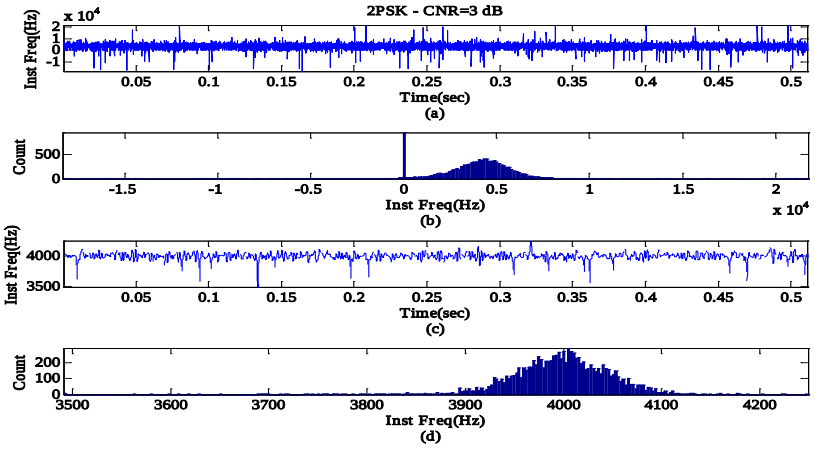

Figure 4 : (a). The Instantaneous Frequency of noisy 2PSK signal *s(t)* (b). Histogram of Instantaneous Frequency (c). The Instantaneous Frequency of First Band Pass Filter (B_1=*1000 Hz*) Output after median filtering (d). Histogram of median filtered Instantaneous Frequency (CNR=3dB)

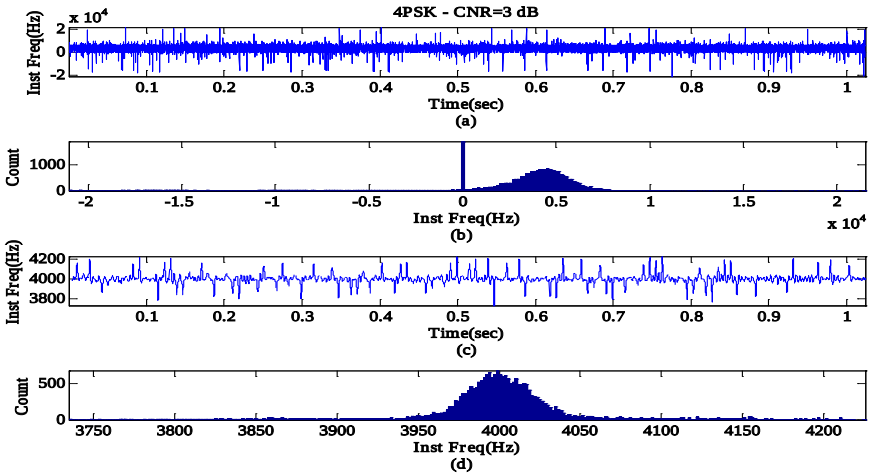

Fig. 4 5. (a). The Instantaneous Frequency of noisy 4PSK signal *s(t)* (b). Histogram of Instantaneous Frequency (c). The Instantaneous Frequency of First Band Pass Filter (B_1=*500Hz*) Output after median filtering (d). Histogram of median filtered Instantaneous Frequency (CNR=3dB)

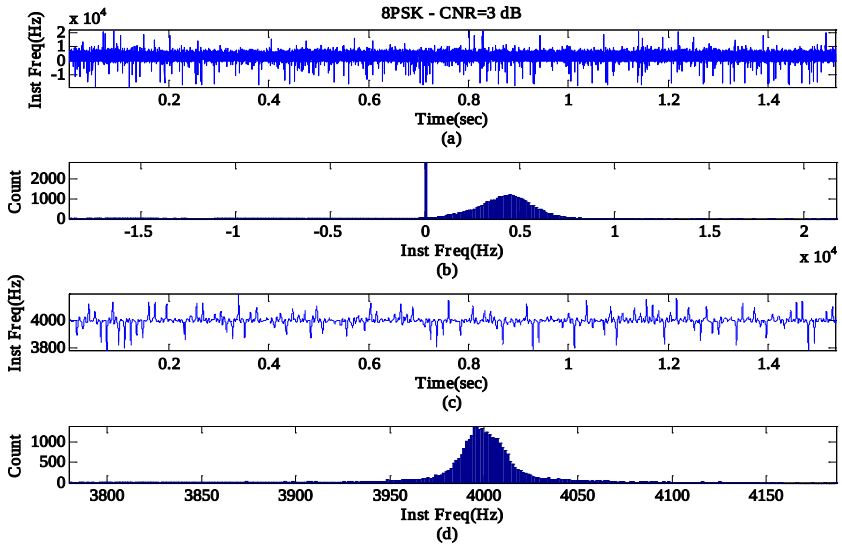

Figure 6 : (a). The Instantaneous Frequency of noisy 8PSK signal *s(t)* (b). Histogram of Instantaneous Frequency (c). The Instantaneous Frequency of First Band Pass Filter (B_1=*330Hz*) Output after median filtering (d). Histogram of median filtered Instantaneous Frequency (CNR=3dB)

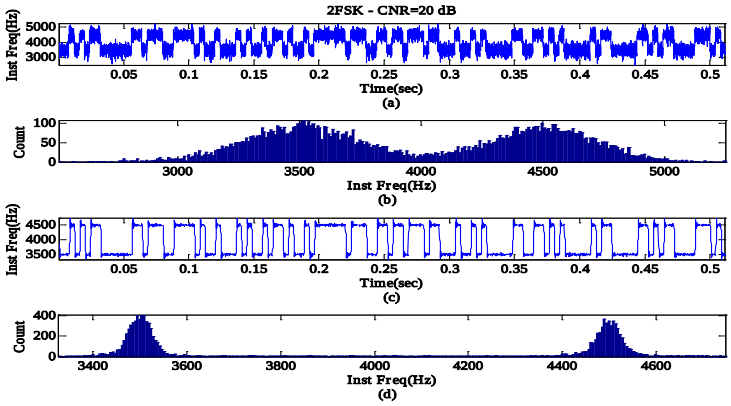

Figure 7 : (a). The Instantaneous Frequency of noisy 2FSK signal *s(t)* (b). Histogram of Instantaneous Frequency (c). The Instantaneous Frequency of First Band Pass Filter Output after median filtering (d). Histogram of median filtered Instantaneous Frequency (CNR=20 dB)

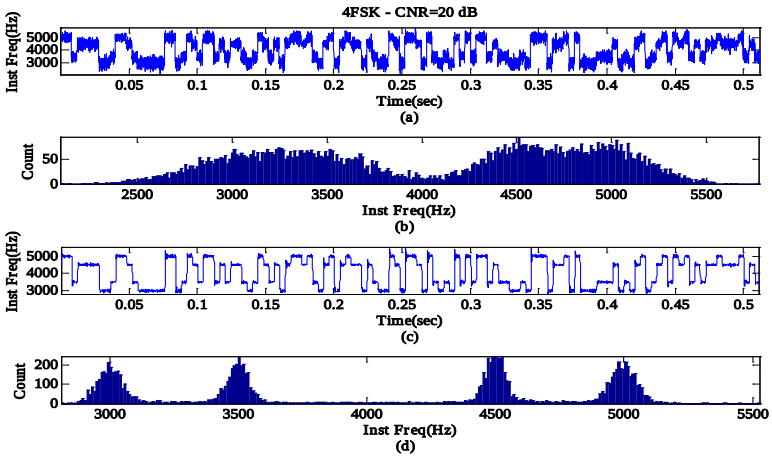

Figure 8 : (a). The Instantaneous Frequency of noisy 4FSK signal *s(t)* (b). Histogram of Instantaneous Frequency (c). The Instantaneous Frequency of First Band Pass Filter Output after median filtering (d). Histogram of median filtered Instantaneous Frequency (CNR=20dB)

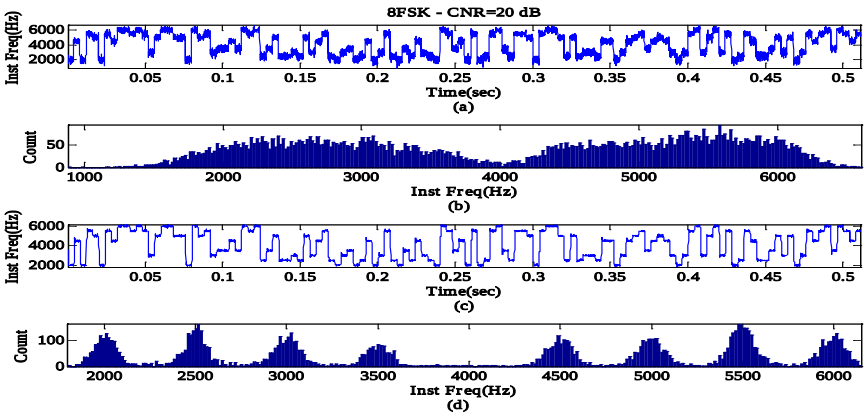

Figure 9 : (a). The Instantaneous Frequency of noisy 8FSK signal *s(t)* (b). Histogram of Instantaneous Frequency (c). The Instantaneous Frequency of First Band Pass Filter Output after median filtering (d). Histogram of median filtered Instantaneous Frequency (CNR=20dB)

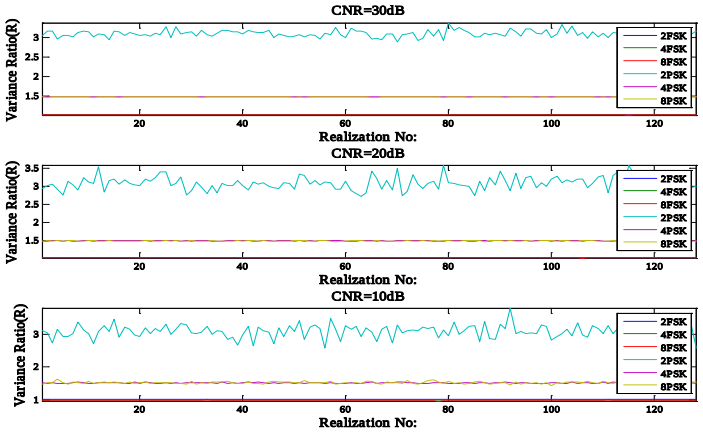

Figure 10 : (a). Variance ratio (R) of Instantaneous Frequencies at the output of two filters for different CNRs- top plot for 30dB, middle plot for 20dB and bottom plot for 10dB

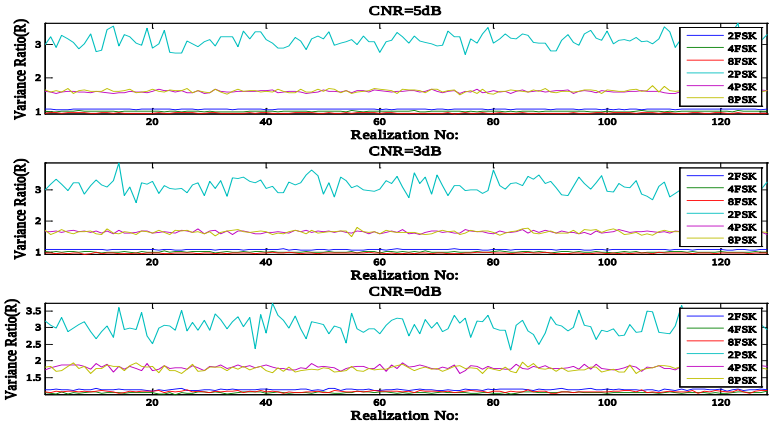

Figure 11 : Variance ratio (R)of Instantaneous Frequencies at the output of two filters for different CNRs- top plot for 5dB, middle plot for 3dB and bottom plot for 0dB

Finally the variance ratios for different cases of PSK and FSK signals are presented in Figs 10 and 11 respectively. In each figure the variance ratio vector is plotted for 128 random realizations of the nosy signal. In Fig 10, the variance ratio for 2PSK signal (cyan curve) wanders around 3 which is very close to the theoretically derived value $K^3=1.5^3 =3.375$. For 4PSK and 8PSK signals his value is 1.5 in stead of 3. The value of 3 can be obtained in these cases too by properly selecting the bandwidth B_1. However, this is not going to be a limitation for our FSK/PSK signal classification problem, since a threshold T_H of 1.4 would serve the purpose even at 0dB. With this threshold value Monte Carlo simulations were carried out for these signals and the misclassification error is found to be minimal as shown in table 1. The impressive performance of the proposed technique even at such a low CNR is attributed to the implicit CNR improvement offered by the band pass filters.

Table 1: Misclassification Error (%)

CNR/ Modulation	30dB	20dB	5dB	3dB	0dB
2/4/8PSK	0	0	0	0	2
2/4/8FSK	0	0	0	0	0

The discrepancies in the variances and the variance ratios observed between the theoretical value R and estimated value $\hat{R}$ in all cases, which are attributed to the following:

1. The expression for the variance of the instantaneous frequency assumes an ideal band pass filter whose response is different from that of the 6-th order chebyshev or butterworth filters used in the simulations. (No notable difference is observed in the results by changing the filter type: chebyshev or butterworth. This is expected because we are finding the variance ratios and the trend in variance is the same in both numerator and denominator.)

2. The effect of spikes in the instantaneous frequency that occur at the symbol boundaries are not considered in the theoretical derivations.
3. The analytical derivations does not include the effect of median filter used in the simulations to eliminate the spikes in the instantaneous frequency.

One more important point is that the values of r_b, f_c and f_d used in the simulations are on lower side and closer to the values found in some ITU V series data modems [15]. These values are considered only for reducing the computational requirements. This, however, is not a limitation of the theory and the proposed algorithm developed in earlier sections.

VI. Conclusions and Future Work

In this paper a novel classification scheme based on the variance of instantaneous frequency to discriminate between noisy M-ary Phase Shift keyed (MPSK) and M-ary Frequency shift keyed (MFSK) signals is proposed. In the proposed method, the received signal is passed through the pair of band pass filters and the ratio of variances of instantaneous frequency of the filter outputs is used as decision statistic. Analytical expressions are developed for the decision statistic. These expressions show that the discrimination between PSK and FSK is possible even at a carrier-to-noise ratio (CNR) of 0dB. The satisfactory performance of the proposed technique even at such a low CNR is attributed to the implicit CNR improvement at the output of the band pass filters. Simulation results validate the theoretical predictions made and the analytical expressions derived. The effect of changing the filter bandwidths and the median filter size on the decision static and the classification within PSK or FSK group (M=2 or 4 or 8) can be considered as the extension of this work.

VII. Appendix A

Consider a set of independent random vectors $\{X_i;\ i= 1,2, \ldots , M\}$ with respective means $\{\mu_i\}$ and standard deviations $\{\sigma_i\}$. Let Y be a random vector formed from {Xi} such that

$$Y = [X_1, X_2, \ldots, X_M] \qquad (A.1)$$

The mean of Y is

$$\mu_y = E\{Y\} = \frac{1}{M}[E\{X_1\} + E\{X_2\} + \cdots . + E\{X_M\}]$$

$$= \frac{1}{M}[\mu_1 + \mu_2 + \cdots . + \mu_M] = \frac{1}{M}\sum_{i=1}^{M}\mu_i \qquad (A.2)$$

The Variance of Y is

$$\sigma_Y^2 = E\left\{\left(Y - \mu_y\right)^2\right\}$$

$$= E\left\{\left[\left(X_1 - \mu_y\right)^2 + \left(X_2 - \mu_y\right)^2 \ldots + \left(X_M - \mu_y\right)^2\right]\right\}$$

Expressing in terms of expectations of individual elements of the vector and substituting for μ_y, we obtain

$$\sigma_Y^2 = \frac{1}{M}\sum_{i=1}^{M} E\left\{\left(X_i - \frac{1}{M}\sum_{i=1}^{M}\mu_i\right)^2\right\} \qquad (A.3)$$

Let us add and subtract μ_i to the term in the bracket to get

$$\sigma_Y^2 = \frac{1}{M}\sum_{i=1}^{M} E\left\{\left((X_i - \mu_i) + \mu_i - \frac{1}{M}\sum_{i=1}^{M}\mu_i\right)^2\right\} \qquad (A.4)$$

By expanding the square term and using the properties of the Expectation operator, we obtain the variance expression as

$$\sigma_Y^2 = \frac{1}{M}\sum_{i=1}^{M}\sigma_i^2 + \frac{1}{M}\sum_{i=1}^{M}\mu_i^2 - \frac{1}{M}\sum_{i=1}^{M}\sum_{j}^{M}\mu_i\mu_j \qquad (A.5)$$

References Références Referencias

1. Partha Pratim Bhattacharya, "Smart Radio Spectrum Management for Cognitive Radio", International Journal of Distributed and Parallel Systems (IJDPS) Vol.2, No.4, July 2011, pp.12-24.
2. A. Sai Raghu, T. Srikanth, Dr. Ch. Sumanth Kumar," Modulation Classification of LPI Radar using Higher Order Statistics(HOS), International Journal of Engineering Research & Technology, Vol. 3, Issue 4, April – 2014, pp.2330-2334.
3. Jackie E. Hipp, "Modulation based on statistical moments", IEEE MILCOM-86 Conference, October 1986, pp.20.2.1-20.2.6,
4. T.G.Callaghan, J.L.Perry,and J.K.Tjho, "Sampling and algorithms aid modulation recognition," Microwaves RF, Sept.1985, pp.117-121.
5. F.F.Liedtke, "Computer simulation of an automatic classification procedure for digitally modulated communication signals with unknown parameters", Signal Processing, Vol.6, No.4, Aug.1984, pp.311-323.
6. F.Jondral, "Automatic classification of high frequency signals", Signal Processing, Vol.9.No.3, pp.177-190, Oct.1985.
7. L.V.Dominguez, et. al., "A general approach to the automatic classification to the radio communication signals", Signal Processing, Vol .22,No.3, March 1991, pp.239-250.

8. M.Hagiwara and M.nakagawa, " Automatic estimation of input signal type," Proceedings GLOBECOM-87, May 1987, pp.254-258.
9. M. V. Subbarao et. al., "A Novel Technique for Automatic Modulation Classification and Time-Frequency Analysis of Digitally Modulated Signals", International Journal of Signal Processing, Image Processing and Pattern Recognition (IJSIP), Vol. 6, No. 2, April, 2013, pp.1-12.
10. Ataollah Ebrahimzadeh Shermeh and Reza Ghazalian, "Recognition of communication signal types using genetic algorithm and support vector machines based on the higher order statistics", Digital Signal Processing, Vol.20, 2010, pp. 1748–1757.
11. Jian Liu, based on daubechies5 wavelet and fractional fourier transform in cognitive radio", IEEE 14th International Conference on Communication Technology (ICCT) 2012, pp.115-120
12. S.O.Rice, "Statistical properties of a Sine wave plus Noise", Bell systems Technical Journal, Vol.27, No.3, January 1948, pp.109-157.
13. John G.Proakis, "Digital Communications", Mc Graw-Hill, 1983.
14. Neal C.Gallagher, JR., and Gary L. Wise, " A Theoretical Analysis of the Properties of Median filters", IEEETrans.ASSP-29, No.6December 1981, pp.466-471.
15. ITU-T Recommendations V.21, V.22, V.22bis.
16. Venkata Krishna Rao M, "Investigation of Window Effects And The Accurate Estimation Of Spectral Centroid", Global Journal of Researches in Engineering (J), Volume XV Issue IV, 2015, pp. 31-41.

This page is intentionally left blank

Global Journal of Computer Science and Technology: H Information & Technology
Volume 15 Issue 3 Version 1.0 Year 2015
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 0975-4172 & Print ISSN: 0975-4350

Influence of Information and Communication Technology on Digital Divide

By Ugonna Onochie Aralu

Introduction- Information and Communication Technology (ICT) is a wide term that refers to all computer-based advanced technologies for managing and communicating information. ICT is an umbrella term that includes any communication device or application including radio, television, cellular phones, computer and network hardware and software, and satellite systems, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICT is often considered to be a general purpose technology, much like steam and electricity in earlier eras that has broad economic impact through multiple applications. ICT is broader than Information Technology (IT) which is defined as "the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware" (Information Technology Association of America, 2008).

GJCST-H Classification: *C.2.1, C.2.0*

Strictly as per the compliance and regulations of:

Influence of Information and Communication Technology on Digital Divide

Ugonna Onochie Aralu

I. Introduction

Information and Communication Technology (ICT) is a wide term that refers to all computer-based advanced technologies for managing and communicating information. ICT is an umbrella term that includes any communication device or application including radio, television, cellular phones, computer and network hardware and software, and satellite systems, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICT is often considered to be a general purpose technology, much like steam and electricity in earlier eras that has broad economic impact through multiple applications. ICT is broader than Information Technology (IT) which is defined as "the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware" (Information Technology Association of America, 2008).

Information and Communication Technologies (ICTs) have changed the way information is stored, disseminated and processed. Information is central in areas of social, economic and political activities. Even though the Internet has brought about freedom, productivity and communication, its uneven distribution and access has led to what refers to as a Digital Divide. The term "digital divide" refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide variety of activities. The world has slipped from the Industrial Age into the Information Age. This emerging Information Society puts a premium on intelligence; value added knowledge, and the application of knowledge to all processes, products and services. This replaces raw sheer physical strength as an economic asset in today's economy. Information and communication knowledge have therefore become critical components of a successful and prosperous society.

The influence of information technology on social practices is to make information more accessible. The developments in information technologies have influenced the continuity of social attitudes, customs or institutions. Social attitudes have changed with the effect that citizens of a society now expect the various elements of that society to be better informed than before. The exclusion leads to a fundamental cleavage to already existing inequality and social exclusion in the society. They also expect to be able to access more information about a specific product, service or organization so that they can make informed decisions with regard to their interactions with that entity. The word institutions can incorporate a wide variety of organizations such as governments, commercial businesses, news and media organizations and educational organizations. Information technology (IT) has the ability to lower coordination cost without increasing the associated transactions risk, leading to more outsourcing and less vertically integrated firms. Lower relationship-specificity of IT investments and a better monitoring capability imply that firms can more safely invest in information technology for inter firm coordination than in traditional investments for explicit coordination such as co-located facilities or specialized human resources; firms are therefore more likely to coordinate with suppliers without requiring ownership to reduce their risk. This enables them to benefit from production economies of large specialized suppliers. Moreover, rapid reduction in the cost of IT and reduction in the transactions risk of explicit coordination makes possible substantially more use of explicit coordination with suppliers. The resulting transaction economies of scale, learning curve effects, and other factors favor a move toward long-term relationships with a smaller set of suppliers. The development in information technology has helped governments to improve on services to their citizens. Advances in Database technology for example have enabled the governments of various countries to collate and monitor statistical information that they can use to combat fraud, manage the economy in a better way. The advances in information technology have heavily influenced commercial businesses in several ways.

II. Societal Impacts of Information and Communication Technology

a) Access to information

The greatest effect of ICT on individuals is the huge increase in access to information and services that has accompanied the growth of the Internet. Computers

Author: *e-mail:uoaralu@gmail.com*

and communication technologies allow individuals to communicate with one another in ways complementary to traditional face-to-face, telephonic, and written modes. They enable collaborative work involving distributed communities of actors who seldom, if ever, meet physically. These technologies utilize communication infrastructures that are both global and always up, thus enabling asynchronous as well as synchronous interactions among individuals, groups, and organizations. Some of the positive aspects of this increased access are better, and often cheaper, communications, such as VoIP phone and Instant Messaging. Technological advancement creates dependent platforms on which communication strives. It has brought new opportunities for leisure and entertainment. The facility enables conducive environment to make contacts and form relationships with people around the world. With the development of computer industry and internet networks, the global communication has reached an unprecedented height. It increases the ability to obtain goods and services from a wider range of suppliers. Information technologies have influenced the continuity of social attitudes, customs or institutions. Social attitudes have changed with the effect that citizens of a society now expect the various elements of that society to be better informed than previously. They also expect to be able to access more information about a specific product, service or organization so that they can make informed decisions with regard to their interactions with that entity.

i. *Commercial Perspective*

Advances such as computer aided design; relational database technologies, spreadsheets and word processing software all provide a commercial benefit to the business, as automation of manufacturing processes and as different businesses compete with each other, the commercial advantage one can have over another may depend primarily on its use of information technologies. The Transformations of the 21st Century have brought about immense organizational changes. The economic environment caused by globalization and technology have forced organizations around the world to make significant transformations in order to competitively survive, adapt and achieve success. Knowledge, information and ideas are now replacing traditional key resources of business like capital, personnel and facilities. Organizations are now restructuring and thereby creating global networks. There are new job opportunities being able to extract information as to what the customer needs, e.g. flexible and mobile working, virtual offices and jobs in the communications industry. This extraction of information is facilitated and indeed made possible by the technology used to store, manipulate and retrieve information with sophisticated hardware and software mechanisms which maximizes its commercial advantage. The use of information technology to monitor a business's performance also enables businesses highlight areas where they are not making the most use of their resources. The use of information technologies increases the businesses income through advertising in the various available forums. Due to the nature of news and media organizations, the information technologies have particular relevance to them.

ii. *Religious perspective*

This has mainly been to the effect of making information about them more accessible. The rapid adoption of the Internet gave rise to a significant body of scholarly research focused on understanding religious practice online. The most aspect of information technologies has influenced the continuity of social attitudes, customs or institutions. For example different religious groups have adopted email for community coordination, projector screen during church services or seminar presentation and websites to read religious materials.

iii. *Educational perspective*

Information and communication technology presents the promise of providing better education to more people more efficiently than can be accomplished without technology. With these developments immense scopes have come to the surface to impart learning in a much more efficient and interactive way. Multimedia technology and internet networks have revolutionized the whole philosophy of learning and distance learning and provided us with the opportunity for close interaction between teachers and learners with improved standard of learning materials compared to what only existed with the printed media. Reflecting in the yester years of ancient learning method where learners line up in single file formations with paper and pencil in their hands; a teacher at the blackboard writing; with learners furiously copying all the that is written and said, memorizing them in anticipation for an examination at the end term. The advent in science and technology has altered learners approach to their studies with an improved access to education, e.g., distance learning with interactive multi-media and on-line tutorials with virtual reality. ICT can be used to help people overcome disabilities e.g. screen magnification or screen reading software enabling partially sighted or blind people to work with ordinary text rather than Braille. ICT in education provides productive teaching and learning in order to increase people's creative and intellectual resources especially in today's information society. Through the simultaneous use of audio, text, multicolor images, graphics, motion, ICT gives ample and exceptional opportunities to the students to develop capacities for high quality learning and to increase their ability to innovate. The nature of education should prepare students to become future workers in a fast changing job market. Access to Internet and the World

Wide Web would enable students to take advantage of the information superhighways. Constant learning and skills acquisition is a necessity to be relevant in a technological dynamic society. Individuals must be equipped with knowledge that will help them transform ideas into serious business ventures. The developments that have occurred in information technology have also had other influences on educational establishments. Educational organizations have a goal to distribute information from a source to the student. The processes by which educational establishments distribute information have become increasingly diverse and the effectiveness of the process has also improved.

iv. *Health perspective*

The influence of ICT on health has contributed immensely to an improved health treatment and diagnosis. Health can be described as the physical and psychological well being of a living thing. The advent of ICT in health care sector has encouraged sustainable development in dispensation, drug administration and dissemination of important health information to the society. It has increased the potency of health information gathering, processing and proffer better solutions in elimination of problems. Healthcare Information System: This is a software solution for appointment scheduling, patient data management, work schedule management and some other administrative tasks related to healthcare.

The digital computer information networking has changed the global economic technological concept with boundless time and space. This phenomenon is called as digital economy or networked economy. The internet integration in developing countries has increased, since it's prevalent among educated individuals, connected to global networks. The development in the Communications field, have bridged the knowledge gaps between the information-rich and the information-poor society that have widen over time. This development has excluded certain parts of the world that have not embraced digital technology from enjoying the dividends of information technology. The changing economic, social and political situations have a direct impact on the individual society members and different business sectors, where organizations have to effectively use and trade in information in order to survive. With the proliferation of the Internet, a medium deemed efficient by many, as a tool enables different parts of the world to interact, carry out business and live side by side in the virtual space. It is proved to be a reality, mainly for the developed world that has access to information technology for decades and therefore mastered the skills for processing, storing and retrieval of information.

III. Societal Importance of Digital Divide

The access to information and communication technologies is the gateway to a sustainable existence in any socio-economic development. The backbone of a nation's socio-economic activities is information driven. The advent and application of digital technologies in social institutions such as banks, businesses, governments, libraries and schools have changed the way the youths relate and interact with social institutions. Timely dissemination of information globally has facilitated an increased level of commercial business activities with small firms being able to register their presence electronically and compete effectively with other businesses across the world. The development of electronic platform has made commerce convenient for individual buyers to carry out transactions electronically. Our technological dynamic society has revealed the scientific advancement in health care, trade, education, and transportation. Digitalization of our society has changed our understanding of economic and social development. The tectonic economics and social change have been characterized by the terms known as "knowledge economy" and "learning society", respectively. This implies the notion that knowledge and learning is core of economic productivity and social development of a nation.

The communication technology infrastructure provides virtual platform through which organization share digital signals, and costs respectively. In a digital networked environment, business organization conforms to an internet based technology, which is an effective and efficient tool in relating with customers and suppliers. The Internet allows scalability in terms of local and global networks. It also allows interoperability, interactivity and flexibility management in branding and customized business networks. This digital interconnection enables businesses to strive globally in conformity with organizational practice. An interactive and networked relationship exists between producers, customers and service providers in cost reduction, increased quality and efficiency. Electronic commerce takes the centre stage in core financial market place which creates greater interdependence in global markets. The dynamism of technology enables an organization to frequently learn the latest trend as to cope with the challenging technological environment. The Profits and products of an organization are based on effective and continual learning of modern technological skills. The acquisition of technological knowledge enables organizations to deal with dynamics of digital word.

The Integration of information communication and technology globally has caused a convergence of economic and social forces, fostering interest and commitments, values and tastes, challenges and

opportunities involving social institutions of the economy. Knowledge and expertise is the base of an organizational culture and traditions. The use of digital technologies increases employees' abilities to produce quality products and services. A dynamic society requires an up-date of products and services satisfy customers need. Information communication technologies are the nervous system of a given society, transmitting and distributing sensory and control information, and interconnecting myriad interdependent units solving complex societal problems of redundancy.

IV. Conclusions

The provision of information technology does not translate into attainment of development. In order to work towards development, skills in processing information are a necessity. Developments such as the Internet and satellite television have created new medium and audiences through which and to which these organizations can disseminate their information. The distribution of information is not the only concern of educational establishments. For example one of the aims of Universities is to create information. This creation is done by research. Information technologies have enabled researchers to access a wider source of information than previously available through such technologies as the Internet. The Internet and other related technologies such as electronic mail also enable collaborative projects to be undertaken between geographically distant groups. People are only key players in the information society if they are well educated, which enables them to acquire the intellect and character to survive in a new and globalized economy.

The availability of internet infrastructure enables publishers or any individual to get and publish information accessible anywhere across the globe. Given the information gap that exists in the world today, issues concerning the information imbalance need to be seriously and genuinely addressed in order to fight poverty and to achieve development. These technologies consists Electronic Mass Media such as Cable Television, pay Television Services, Interactive Television, Wireless Cable Systems, Streaming Media, Radio broadcasting , Direct Broadcast Satellite, Computers and Consumer Electronic such as Multimedia computers Video Games, The Internet and the World Wide Web, Office Technologies, Internet Commerce, Virtual and Augmented Reality, Home video and Digital Audio and Technology and Satellite technologies. The use of these technologies creates interdependence in continuous assessment of business performances to identify grey areas indicating that resources are underutilized. The creation of vital infrastructure ensures increase in businesses income through adverts in various available fora emerging on information platform.

References Références Referencias

1. The Impact of Information Technology on Work and Society. Available from <http://www.benmeadowcroft.com/reports/impact/>. [6 February 2014].
2. Impacts of Information Technology on Society in the new Century. Available from:<http://www.zurich.ibm.com/pdf/Konsbruck.pdf>. [6 February 2014].
3. Impact of IT on society. Available from:<http://ciaran-impactofitonsociety.blogspot.com.au/>.[6 February 2014].
4. The Impact of Information Technology on the Organization of Economic Activity: The "Move to the Middle55 Hypothesis. Available from:<http://mesharpe.com/MISVirtual/10Clemons%20.pdf>.[6February 2014].
5. Impact of IT on society in the new century. Available from:http://www.zurich. ibm.com/ pdf/ news/Masutti.pdf. [6February 2014].
6. Positive and Negative impacts of ICT. Available from: <http://ajahana.wordpress.com/2012/06/27/the-positive-and-negative-impacts-of-ict-5/>.[6 February 2014].
7. OECD (1992), Guidelines for the Security of Information Systems, Paris.
8. Anao, A. R. (2003). Society, knowledge incubation and management - Lagos. The Guardian Newspapers, November 11, 75.
9. Becker, H. (1986). Computers in the schools. A Recent update. Classroom Computer Learning, January, 96-102.
10. Bergheim, K., & Chin, K. (1984). Computers in the classroom. InfoWorld, September 10, 28-37.
11. Burnett, G. (1994). Technology as a tool for urban classrooms. ERIC/CUE Digest, 95, New York: Eric Clearing house on Urban Education, retrieved December 21, 2004, from http://www.ericdigests.org/1994/tool.htm.
12. Carlson, S., & Firpo, J. (2001). Integrating computers into teaching: Findings from a 3-year program in 20 developing countries. In L. R Vandervert, L. V. Shavinina & R. A. Cornell (Eds.), Cyber education: The future of Distance Learning. Larchmont, NY: Mary Ann Liebert, Inc, 85-114.
13. Information Technology Association of America, 2008
14. Dabalen, A., & Oni, N. (2000). Labour market prospects for university graduates in Nigeria. World Bank Report on Nigeria University system innovation project.
15. Elluh, J. (1989). What I believe, Grand Rapids, MI: Erdmann.
16. Fitzgerald, G., & Werner, J. (1996). The use of the computer to support cognitive behavioral

interventions for students with behavioral disorders. Journal of Computing in Childhood Education, 7, 127-48.
17. Harper, D. O. (1987). The creation and development of Educational computer technology. In R. M. Thomas & V. N. Kobayashi (Eds.), Educational technology: its creation, development and cross-cultural transfer, Oxford: Pergamon Press, 35-63.
18. Hess, F. M., & Leal, D. L. (2001). A shrinking "digital divide"? The provision of classroom computers across urban school systems. Social Science Quarterly, 18 (4), 765-778.
19. Okebukola, P. (1997). Old, new and current technology in education. UNESCO Africa, 14 (15), 7-18.
20. Paltridge, S. (1996). How competition helps the Internet. OECD Observer, 201, August/September, 26.
21. Poole, G. A. (1996). A new gulf in American education, the digital divide. New York Times, January 29.
22. Rosen, L., & Michelle, W. (1995). Computer availability, computer experience and technophobia among public school teachers. Computer in Human Behaviour, 11, 9-31.
23. Salomon, G. (1989). Computers in Curriculum. In M. Eraut (Ed.), The International Encyclopedia of Educational Technology, Oxford: Pergamon Press, 167-170.
24. Shavinina, L. V. (1997). Educational multimedia of "tomorrow": High intellectual and creative psycho educational technologies. Presented at the European congress of Psychology, April 17-19, 1997, Dublin, Ireland.
25. Shavinina, L. V. (2001). A new generation of educational multimedia: High intellectual and creative educational multimedia technologies. In L. R Vandervert, L. V. Shavinina & R. A. Cornell (Eds.), Cyber education: The future of Distance Learning. Larchmont, NY: Mary Ann Liebert, Inc, 63-82.
26. Smith, D. (1989). Microcomputers in schools. In M. Eraut (Ed.), The International Encyclopedia of Educational Technology, Oxford: Pergamon Press, 170-175.
27. Thierer, A. (2000). Divided over the digital divide, Washington, DC: Heritage Foundation.
28. Thomas, R. M. (1987). Computer technology: An example of decision-making in technology transfer. In R. M. Thomas & V. N. Kobayashi (Eds.), Educational technology: its creation, development and cross-cultural transfer, Oxford: Pergamon Press, 25-34.
29. Visscher, A., Wild, P., Smith, D., & Newton, L. (2003). Evaluation of the implementation, use and effects of computerized management information system in English secondary schools. British Journal of Educational Technology, 34 (3), 357-366.
30. Walton, R. E. (1985). Towards a strategy of eliciting employee commitment based on policies of mutuality. In R. E. Walton & P. R. Lawrence (Eds.), HRM, trends and challenges, Boston: Harvard Business School Press, 34-76.
31. Westera, W., & Sloep, P. (2001). The future of education in cyberspace. In L. R Vandervert, L. V. Shavinina & R. A. Cornell (Eds.), Cyber education: The future of Distance Learning. Larchmont, NY: Mary Ann Liebert, Inc, 115-136.
32. Michel, A., 2003. Reexamining information systems success through the information technology professionals perspective. Sprouts: Working Papers Inform. Environ. Syst. Org., 3:122-136,URL:http://whitepapers.zdnet.com/abstract.asp x?docid= 175278.
33. Havill, J. T. and Ludwig, L. D. Technically speaking: fostering the communication skills of computer science and mathematics students. In Proceedinds of the 38th SIGCSE Technical Symposium on Computer Science Education. SIGCSE '07. ACM Press, New York, NY, 2007;185-189,URL: http://www.seerc.org/ieeii2007.
34. Phillip, B. and L. Nicola, 2007. Communications, technology and society-use of research seminar topics as part of an ICT learning program, Proceedings of the Informatics Education Europe II Conference, IEEII 2007:97-106, URL: http://www.seerc.org/ieeii2007/Paperindex.html.
35. Anderson, B. and K. Tracey, 2001. Digital living: The impact (or otherwise) of the Internet on everyday Life. American Behavioral Scientist, 45: 456-475, URL: www.sagepub.com.
36. Jennings, N. and E. Wartella, 2004. Technology and the Family. In: Handbook of Family Communication, Vangelisti, A.L. (Ed.). Erlbaum Associates, Mahwah, pp: 593-608, 2nd edition.
37. Valentine, G. and S. Holloway, 2001 Technophobia: Parents and Children's Fears about Information and Communication Technologies and the Transformation of Culture and Society. In: Children, Technology and Culture: The Impacts of Technologies in Children's Everyday Lives,
38. Hutchby, I. and J. Moran-Ellis (Eds.). Routledge, London, 58-77, 1st edition.
39. Ehikhamenor, F.A., 2002. Socio-economic factors in the application of information and communication technologies in Nigerian print media. American Society for Information Science and Technology, 53(7): 602-611, URL: www3.interscience..wiley. com/journal/93514716.
40. Braa, J., E. Monteiro and S. Sahay, 2004. Networks of action: Sustainable health information systems across developing countries. MIS Quarterly, 28: 337-362,URL: http://www.misq.org/archivist/vol/no 28/Issue3/vol 28n3index.html

41. Lakhani, K.R. and R.G. Wolf, 2005. Why Hackers Do What They Do: Understanding Motivation and Effort in Free/Open Source Software Projects. In: Perspectives on Free and Open Source Software,
42. Feller, J., B. Fitzgerald, S. Hissam and K. Lakhani (Eds.). MIT Press, Cambridge, MA, ISBN-10: 0-262-06246-1, ISBN-13: 978-0-262-06246-6 pp: 3-21, 1st edition.10. Câmara, G. and F.T. Fonseca et al., 2006.
43. Networks of innovation and the establishment of a spatial data infrastructure in Brazil. Information Technology for Development 12(4): 255 272, URL:http://eu.wiley.com/WileyCDA/WileyTitle/productCd-0787994766.html
44. Rossi, M.A, 2004. Decoding the free/open source (F/OSS) software puzzle a survey of theoretical and empirical contributions. Quaderni dell'Istit. Di Econ., 424: 1-40, URL:
45. http://www.unisi.it/lawandeconomics/students/XVII/rossi/papers.html Sagers, G.W., 2004. The influence of network governance factors on success in open source software development projects. In: 25th International Conference in Information Systems (ICIS 2004), December 12-15, Published by Association for Information Systems, USA, 427-438, URL: http://aisel.isworld.org/home.asp.
46. Wilson, E.J., 2004. The Information Revolution and Developing Countries. MIT Press, Cambridge, Mass, ISBN-10:0-262-23230-8, ISBN-13:978-0-262-23230-2:37-118, 1st edition.
47. King, J., T. Bond and S. Blanford, 2002. An investigation of computer anxiety by gender and grade. Computers in Human Behavior, 18, 69-84, URL: http://www.sciencedirect.com/science.
48. van Daal, V. and P. Reitsma, 2000. Computerassisted learning to read and spell: Results from two pilot studies. Journal of Research in Reading., 23(2): 181-193, URL: http://www.blackwellpublishing.com/journal.asp?r ef=0141-0423.
49. Brown, B.A., Reveles, J.M. and Kelly, G.J., 2005. Scientific literacy and discursive identity: A theoretical framework for understanding science learning. Science Education, 8: 779-802, URL: http://www3.interscience.wiley.com/journal/32122/home?CRETRY=1&SRETRY=0.
50. Virk, B., 2004. A balancing act: Improving student online discussion participation. Int. J. Instruct. Technol, Vol 1. No. 6, ISSN 1550-6908, URL: http://www.itdl.org/Journal/Jun_04/index. htmarticle 08.htm
51. Garrison, D. R., T. Anderson and W. Archer, 2001. Critical thinking, cognitive presence and computer conferencing in distance education. Am. J. Distance Educ., 15(1): 7-23, URL:http://www.ajde .com/Contents/vol15_1.htm.
52. Kinshuk, C.S. and L.M. Hunt, 2004. Assessing discussion forum participation: In search of quality. Int. J. Instruct, Vol 1. No. 12. ISSN 1550-6908, URL:http://www.itdl.org/Journal/Dec_04/index.htm,article01.htm
53. Campos, M., 2004. A Constructivist method for the analysis of networked cognitive communication and the assessment of collaborative learning and knowledge building. J. Am. Learn. Networks, 8(2): 1-29, URL: http://www.sloanc. org/publications/jaln/v8n2/pdf/v8n2_campos.pdf.
54. Spatariu, A., K. Hartley and L.D. Bendixen, 2004. Defining and measuring quality in on-line discussion. Journal of Interactive Online Learning., 2(4): 1-15, URL: http://www.ncolr.org/jiol/issues/PDF/2.4.2.pdf.
55. Câmara, G. and F.T. Fonseca, 2007. Information policies and open source software in developing countries. Journal of the American Society for Information Science and Technology, 12(4): 255-272,URL:http://www.asis.org/Publications/JASIS/tocs.htm.
56. Couldry, N., 2004. The Digital Divide. Web Studies. 2nd Edition. Published by Arnold, London, 185-195.
57. Slevin, J., 2000. The Internet and Society. Blackwell Publishers Ltd., Oxford, UK, 1st edition, ISBN: 0-7456-2086-8, ISBN: 0-7456-2087-6 (pbk),
58. Webster, F., 2002. Theories of the Information Society. 2nd Edn. Routledge, London and New York.

Global Journal of Computer Science and Technology: H Information & Technology
Volume 15 Issue 3 Version 1.0 Year 2015
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 0975-4172 & Print ISSN: 0975-4350

Character Education Development Model-based E-Learning and Multiple in Telegency in Childhood in Central Java

By Rafika Bayu Kusumandari Istyarini
Semarang State University

Abstract- Kusumandari, et al. 2015. Character Education Development Model-Based E-Learning and Multiple Intelegency In Childhood In Central Java. Competitive Research Grant. Faculty of Education. Semarang State University.

Keywords: *character education, e-learning and multiple intelegency.*

GJCST-H Classification: *I.2.11*

Strictly as per the compliance and regulations of:

Character Education Development Model-based E-Learning and Multiple in Telegency in Childhood in Central Java

Rafika Bayu Kusumandari Istyarini

Abstract- Kusumandari, et al. 2015. Character Education Development Model-Based E-Learning and Multiple Intelegency In Childhood In Central Java. Competitive Research Grant. Faculty of Education. Semarang State University.

Keywords: character education, e-learning and multiple intelegency.

Character education will be more meaningful if carried out since early childhood. At the early age of 0-6 years, the brain develops very rapidly up to 80 percent. At that age the brain to receive and absorb various kinds of information, does not look good and the bad. That is the period in which physical, mental and spiritual child will begin to form. On the implementation of character education for early childhood adapted to the characteristics of each school and the emphasis of each institution penyelenggarakan early childhood education. Moreover, childhood is a time of play will be more fun if the learning utilizing e-learning and simultaneously develop multiple intelligences (multiple integency). This study intends to develop character education model based on e-learning and multiple intelligences in early childhood based in Central Java. As the above description, the problem in this research are: development of character education model based on e-learning and multiple intelligences in early childhood based in Central Java. Referring to the research to be conducted, a "Research and Development", meaning that a research program followed up with a development program for the repair or improvement (Arikunto, 1996: 9). To produce a prototype management of character education in early childhood based on e-learning and multiple intelegency in Central Java, taken systematic steps in the form of the process of action, reflection, evaluation and innovation by applying qualitative research methods, descriptive, development, experimentation, and evaluation.

Research result

I. Introduction

a) Background

Character development which is an effort to mandate embodiment of Pancasila and the 1945 Constitution was motivated by the reality of a growing national problem today, such as disorientation and not dihayatinya Pancasila values; limitations of integrated policy tools in realizing the values of Pancasila; shifting the value of ethics in the life of the nation; waning awareness of the cultural values of the nation; the threat of national disintegration; and the weakening of national independence (Parent Book Character Development of National Policy 2010-2025). To support the realization of the ideals of character development, as mandated in the Pancasila and the 1945 Constitution as well as addressing the problems of nationality today, the Government makes character development as one of the priority programs of national development where character education is placed as a foundation for realizing the vision of national development, namely " people realize noble, moral, ethical, cultural, and based on the philosophy of Pancasila. "

Character education will be more meaningful if carried out since early childhood. At the early age of 0-6 years, the brain develops very rapidly up to 80 percent. At that age the brain to receive and absorb various kinds of information, does not look good and the bad. That is the period in which physical, mental and spiritual child will begin to form. Therefore, many are calling this period as the golden days of the child (golden age). This is also due early childhood education is the foundation for the formation of character. On the implementation of character education for early childhood adapted to the characteristics of each school and the emphasis of each institution penyelenggarakan early childhood education. Moreover, childhood is a time of play will be more fun if the learning utilizing e-learning and simultaneously develop multiple intelligences (multiple integency).

This study intends to develop character education model based on e-learning and multiple intelligences in early childhood based in Central Java.

i. *Issues to be examined*

As the above description, the problem in this research are: development of character education model based on e-learning and multiple intelligences in early childhood based in Central Java.

ii. *Special Purpose*

In keeping with the focus of research, in particular the objectives to be achieved through this

Author: Semarang State University. e-mail: mba_fika@yahoo.co.id

research is to find once described the development of character education model based on e-learning and multiple intelligences in early childhood based in Central Java.

II. Research Methods

The research method is equipped with a flow chart that illustrates what research has been done and achieved before appropriate roadmap college research. It would be better if the presentation can be associated with the achievements of researchers that can be used as a reference to resume the research activities will be proposed and will be done during the study period. Methods must explain fully clear stages of research, outcomes, measurable achievement indicators at each stage.

Referring to the objectives to be achieved, this research program was designed with a "Research and Development", meaning that a research program followed up with a development program for the repair or improvement (Arikunto, 1996: 9). To produce a prototype management of character education in early childhood based on e-learning and multiple intelegency in Central Java, taken systematic steps in the form of the process of action, reflection, evaluation and innovation by applying qualitative research methods, descriptive, development, experimentation, and evaluation.This study aims to gain in-depth picture of the model of character education in early childhood based on e-learning and multiple intelegency in Central Java. Reason uses a qualitative method because it uses the knowledge of researchers, there are no results of the assessment and empirical research specifically about the model character education in early childhood based on e-learning and multiple intelegency in Central Java. Therefore, as was common in scientific research steps taken by the researcher is doing exploratory (exploration) of the object being studied. In that connection the qualitative method is one method of research that offers design exploratory research aiming. Unlike the design of experimental research for example on the design of qualitative research investigators did not starts from a certain frame of mind, but let the natural setting of research / as they are and seeks to understand the phenomenon that is by putting yourself in the object being studied (empathy). Another reason is because the use of qualitative methods with qualitative methods ideas, concerns, attitudes and values of a number of people who are being studied can be easily understood (Zelker, 1989 in Utomo 1997: 71).

Data were collected from experienced background (natural setting) as the data source directly. Purposing the data can only be done if the depth obtained on facts obtained. This study is expected to build an inductive theory of abstractions of data collected about character education models in early childhood based on e-learning and multiple intelegency in Central Java is based on the findings of significance in the background experienced. Early childhood education is the object of research is the educational institutions of early childhood education e-learning-based characters and multiple intelegency that exist in Central Java.The principle of qualitative research emphasized that any findings (provisional) based on the data, so finding it increasingly tersahihkan before crowned as theory (Alwasilah, 2003: 102). Qualitative research design focuses on certain phenomena which do not have the generalizability and comparability, but has internal validity and contextual understanding. What to do researchers to achieve the objectives of the research on the outline four, namely (1) to build familiarity with the respondent, (2) sampling, (3) data collection, and (4) data analysis. This research is not simply linked to the knowledge that can be reworded (proportional knowledge), but also about knowledge that can not be reworded (tacit knowledge), which is almost impossible to obtain through rationality approach (Lincoln and Guba in Alwasilah, 2003: 103). Cases studied is a model of character education in early childhood based on e-learning and multiple intelegency in institutions of early childhood education that has a distinctive background. Although the design of this study will be gradual, but the events (event) special observations were made simultaneously.

Based on the conceptual findings from the school, then performed the comparative analysis and conceptual development, to receive an abstract of the characteristics of the model of character education in early childhood based on e-learning and multiple intelegency in Central Java. In line with the design of qualitative research, this study sought to understand the meaning of events and interactions of people in certain situations. To be able to understand the meaning of events and interactions of people, used the theoretical orientation or theoretical perspective with a phenomenological approach (phenomenological approach). This approach is determined by observing the phenomena observed subjects conceptual world through the actions and thoughts in order to understand the meaning compiled by the subject in everyday events.

This research program will be gradually carried out with the following activities:

a. To study literature in an interdisciplinary and critical analysis of the results of previous studies that are relevant to the theme of the research.
b. Designing and carrying out preliminary studies to produce a complete description of the development model of character education in early childhood based on e-learning and multiple intelegency in Central Java.

c. Based on the development of the existing character education and a number of relevant theory, prepared (developed) a prototype model of character education in early childhood based on e-learning and multiple intelegency in Central Java.
d. Conducting seminars workshops with relevant experts and praktisis on prototype models of character education in early childhood based on e-learning and multiple intelegency in Central Java. The target of this workshop seminar is drafting "book character education models in early childhood based on e-learning and multiple intelegency", who socialized in the institutions of early childhood education as a reference for the implementation of character education based on e-learning and multiple intelegency.
e. To disseminate the educational model of character development in early childhood based on e-learning and multiple intelegency in Central Java.
f. Conducting trials to determine the effectiveness of character education models in early childhood based on e-learning and multiple intelegency developed in the implementation of character education.
g. Revising the development model of character education in early childhood based on e-learning and multiple intelegency in Central Java based on the test results as the final result of the research program conducted.

This penelitiaan are multi-year, which was designed in three stages of activity. In the first year, conducted a study to map the needs of the development of models and devices through a learning needs analysis / needs assessment to formulate design models. The second year, made the application, evaluation, and determination of the final model. Third year, made the implementation of the final model in the development of character education models in early childhood based on e-learning and multiple intelegency in Central Java.

Source of data in this study consisted of:

1. The primary source is the activity of the model development process of character education in early childhood based on e-learning and multiple intelegency in Central Java (which include: curriculum, syllabus, lesson plans, teaching materials, instructional media, instructional evaluation tool), educator or instructor and learners.
2. A secondary source is the organizer of the character education program in early childhood education institutions were regarded as supportive of the primary data sources, literature, photographs of activities, and other documents from the institution that life skills education providers are expected to provide information about the issues being investigated.

Data collection techniques in this study are:

1. The non-participant observation conducted in a focused and thorough observation sheet instruments are structured using a scale to obtain data relating to the learning process and learning tools that have been used in the character education program. Recording the results of observations followed by the recording of learning through a photo camera.In-depth interviews (in-depth interviewing) with open interview guide instrument made to capture data from key informants with a flexible structure so that the information obtained has sufficient depth. Interviews were conducted to educators, learners and providers of early childhood education programs.
2. Questionnaire with instruments to complete the enclosed questionnaire data can not be obtained through in-depth interviews of key informants.
3. The documentary studies, performed on documents relating to perma¬salahan research, including a review of the literature sources.

Validity of the data in this study pursued by: (a) test of the credibility that includes triangulation, perseverance observation, discussion with colleagues; (B) transferability test by presenting data that is easy to understand, detailed reports; (C) test of dependability by conducting an audit of the whole process of research; (D) confirmability test, the results of the research process.

III. Results and Discussion

a) Research Result

Based on research proposals that have been submitted by the research team, this research took four (4) areas within the province of Central Java as a research sample. The third area is Banyumas, Semarang City, Tegal and Holy District. Here below we present briefly our results is based on data collection activities in all four areas. We use a Focus Group Discussion (FGD), observations, and questionnaires to collect data from the field. In the first stage of the study, there are two activities that are carried out preliminary studies and field studies on the implementation of character education based on e-learning and multiple intelligences.

Before discussing in more detail the data obtained in the field by the data collection team, some of the data and information collected through searches of information by the data collection team before heading to the field is relatively strengthened by the data and information when it plunged into the field.

For schools that we make sample in each district / city taken two pieces of schools where one public school and one private school. For our public schools take the Pembina State kindergarten pilot schools for each district / city. As for the private school

we took a school that has a diverse kualitass. This was done to provide an overview of the implementation of multiple intelligence-based character education and e-learning.

In the event of preliminary studies conducted field needs analysis in this study include: the subject of research, data related to the condition of learners, and conditions associated with the learning process of students in kindergarten. Subject of this research that Pembina State TK Semarang, Semarang Labschool kindergarten, kindergarten Pembina State Holy, Holy Batik kindergarten, kindergarten Pembina State Tegal, Tegal Aisyiah kindergarten, kindergarten and kindergarten State Trustees Pertiwi Cindaga Purwokerto, Banyumas. Data about the condition of the students throughout the school that is the subject of research as well as everything that is needed in the learning process is described in a preliminary study (exploratory study). Conditions associated with the learning process of students were analyzed by means of understanding the learners and study the problems that occur in the learning process, then define its needs. Researchers develop Multimedia Interactive Learning for cultivation of character education in accordance with the conditions of each subject of study. This is because each of the research subjects have characteristics that differ from one another even though the characters are developed equally, but for different implementation.

1. Implementation of Character Education Based E-Learning and Multiple Intelegency in Each School

Character education model based on e-learning and multiple intelegency in Central Java revealed aspects of the scope of objectives, materials, costs, schedule of teaching, learning tools, implementation, evaluation systems, and facilities.

This component of the research results are presented in the following table.

Table 5.1: Program Planning Programme

No	Component	Persentage
1	Purpose	95 %
2	Content	65 %
3	Cost	88%
4	ScheduleofLearning	100 %
5	Learning tools	90 %
6	Implementation ofactivities	85 %
7	Evaluation system	65 %
8	Facilities	76 %
9	The ability of teachersinimplementing the learning	100%
10	The ability of teachersin preparingmedia	69%

Based onthe table above, show sthatres pondents in this study stated purpose 92%, materials 65%, the cost of 88%, 100% learning schedule, learning devices 90%, 85% implementation, evaluation systems 65%, and 76% facility. Based onempirical studies on character education modelbased on e-learning andmultipleintelegency, the design of the initial modelis structured as follows.

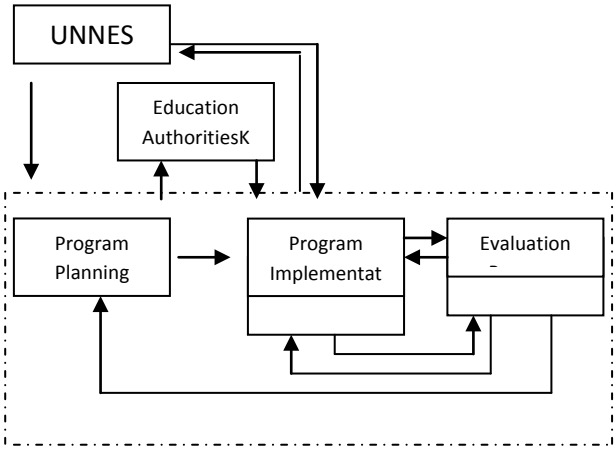

Figure 4 . 1 : Hypothetical Model-based Character Educatione-learning and multiplein telegency

Character education model based on e-learning and multiple intelegency was developed to adjust to the characteristics and Khasan to each school. To improve the model to be applied, then the activities of FGD (Focus Group Discussion) by inviting practitioners AUD, Kajur ECD Unnes and Multimedia Expert Learning (From BPM). FGD activities held on July 26, 2015 at 09:00 held at the Pembina State TK Semarang. This event was attended by five people namely Ms. Suliyem (Principal TK Pembina State Semarang, AUD education practitioners, and trainers AUD national level), Ms. Arum (AUD practitioners and kindergarten teacher Pembina State), Mr. Agustiarso (multi media expert penbelajaran from BPM) and Research Team.

FGD conducted to find a character-based education model based on e-learning and multiple intelegency appropriate so that it will achieve the goals that have been set optimally. This model is also to facilitate the implementation of character education based on e-learning and multiple intelegency for young children.

From the result sobtained discussion of character ducation model based on e-learning and multiple in telegencyas follows:

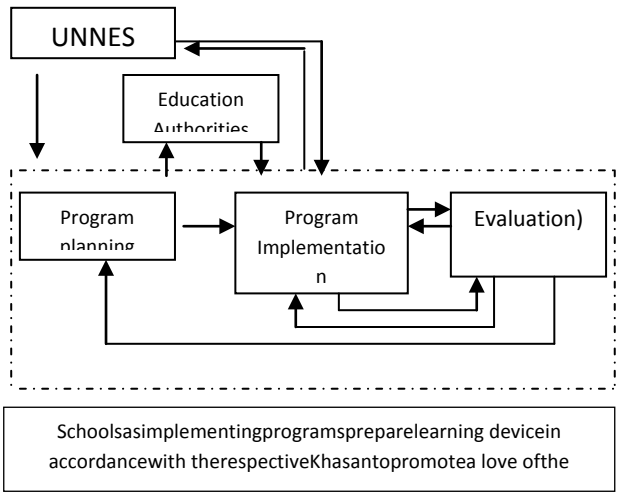

Figure 4.2 : Model-Based Character Educationе-learning andmultipleintelegency

From the above model, the implementation of character education based on e-learning and multiple intelegency in each institution to forward to Khasan each school. Additionally, the implementation is also customize the capabilities of each school. Learning tools will be made to the implementation and evaluation of more focused so that the expected results are satisfactory.

Here are presented the results of a needs analysis and preliminary study in each school

a) Pembina State Kindergarten of Semarang

As a kindergarten pilot project at the provincial level, kindergarten Pembina State Semarang trying to become a pioneer in the formation of character. Moreover, character education given to children at an early age they will be a strong foundation in the formation of character. For characters that are developed are trying to develop 18 values derived from religion, Pancasila, culture and national education goals. However, more emphasis on the spirit of nationalism, religious, discipline and patriotism. For values of other characters follow the most important thing to do is habituation. In the implementation of character education, every Monday is always held the flag ceremony, it is intended that the children understand the spirit of nationalism through respect for the state symbols and the national anthem Indonesia Raya. Religious values instilled by their religious education in accordance with the religion and beliefs held by learners. In addition, every day children are encouraged to save and charity by putting money into the alms boxes placed in front of the teacher's office. The amount of savings and charity are not determined to train the sincerity of learners. This is done to embed children's understanding of the importance of sharing and caring with each other. The value of discipline instilled by coming to school on time, in uniform in accordance with applicable regulations, carrying supplies and keeping the environment clean. While the value of patriotism instilled by providing teaching national anthems, local clothes, folk songs, and culture that exist in Indonesia.

Implementation of character-based learning e-learning and multiple intelegency held every Wednesday for Thursday's class A and class B. This is because of the limited CD Learning about the limited character education and LCD projectors owned. While the material usually take from CD Character Education Learning Center shipment of IGTKI and buy the appropriate CD. Sometimes teachers also download the material on the internet. The new school currently has 4 pieces of LCD projectors and 6 laptops. All teachers are required to have a laptop, especially who have received teacher certification allowance (currently 100% kindergarten teacher Semarang State Trustees have received teacher certification allowance) so that all teachers are able to implement e-learning-based learning. The ability of the teacher is obtained from following a course and training. There are even some teachers who participated in the built BPM for interactive learning media. The skills they have, and then transmitted to colleagues at the school so that all teachers have sufficient ability in implementing e-learning based education. For the procurement of infrastructure and media education, the school always conduct needs analysis beginning of each new school year so that the purchase of infrastructure adapted to the needs. In the multiple intelligences (multiple intelegency) which focused on linguistic-verbal intelligence, kinesthetic intelligence, interpersonal intelligence, intrapersonal intelligence and naturalist intelligence. Although for development adapted to the intelligence (talent) of each child.

b) Lab School KindergartenUnnes Semarang City

TK Lab School to develop a program on the grounds that children learn best way is through play. It is based on the results of studies showing that the play gives them a chance to learn that encourage social relationships, language development, understanding numbers, letter recognition, thinking skills, along with other core subject areas. While the children play they also learn about life skills and values such as teamwork, creativity and tolerance with others.Implementation of character-based learning e-learning and multiple intelegency held every Thursday so-called Creative Thursday. Each child will work with the parents as a sustainable project with program / learning theme. For the best creations will be given a trophy so the parents will be more enthusiastic to join the program as a form of wonderful cooperation between children and parents.The focus in terms of the characters in the character education planting love of the homeland and the nation through learning programs in the classroom.

It also added knowledge about gender as well as the formation of good habits at school. Technology development through multimedia learning class in the classroom. In the e-learning-based learning and multiple intelegency, applied since 2011, once a week children are introduced to learning by using multimedia. Teachers here also absolute need to be able to use educational games in any form. It also developed the book "I Am a Child Terrific" which contains the order of good behavior according to the customs and norms of Indonesia and age. With this book as a discipline embedded expected characteristic of Indonesian children.In addition, multiple intelligences (multiple intelegency) developed more emphasis on kinesthetic intelligence, interpersonal intelligence, intrapersonal intelligence and naturalist intelligence. There are some activities undertaken to support the development of multiple intelegency namely (1) extra feeding conducted two times each month on Wednesday week 2 and 4. The purpose is to introduce healthy food to students, to develop aspects of student progress and to train students' independence, especially in terms of procedures for eating. (2) outdoor activities held every Saturday held the first week in the pool Hotel Patrajasa at 8:00 to 10:00 pm. Activities include swimming, sand play and whirlpool. Each child is required accompanied by a parent or caregiver.E-learning material, obtained by the procurement of instructional CD and download on the internet. Incidentally Unnes also many students who do research at the Lab School kindergarten thesis theme associated with MPI. As for the provision of facilities and infrastructure, all supplied by the State University of Semarang with road apply for the provision of facilities and infrastructure required and also of the contribution of parents. This is done so that the facilities and infrastructures needs can be met in order to facilitate the learning process.

c) Pembina State Kindergarten of Purwokerto

As a pilot school in Banyumas, character education becomes the focus of learning in kindergarten Pembina State Purwokerto. Implemented character education in kindergarten Purwokerto Pembina State does not implement all (18 value) directly, but more emphasis on patriotism, discipline and religious. Character education is very important to be implemented in early childhood with the aim to develop attitudes and behavior. For the other value will follow customized with habituation to the main children with discipline. Implementation is guided by the applicable national curriculum. The goal is self-reliance and social responsibility of the child. For the implementation of character education is integrated in the daily learning. Implementation of character education based on e-learning and multiple intelegency been implemented because it is more acceptable to the students and easy to understand. For media used partly bought and partly made by teachers although the extent of the form of power point (not Multimedia Interactive Learning). The ability of teachers to implement character education learning-based e-learning and multiple intelegency with training and coaching on hold teachers.While in the procurement of facilities and infrastructure, the school did not count on help from the government, but more emphasis on self-help themselves. Teachers already skilled in making learning media, although not able to create a more modern. But it is good enough for the implementation of active learning, interactive and fun so that students do not feel tired and better able to understand the material presented by the teacher. All teachers have prepared a complete learning device.

Until now, the implications and impact of the implementation of character education based on e-learning and multiple intelegency already noticeable. Like, courtesy of students as evidenced by the good behavior as already noticeable. Like, courtesy of students as evidenced by the good behavior like kissing the hand of a teacher when met, spoken word children too polite. In addition, if there are children who do not behave well, will remind his friends by saying the advice of teachers and media impressions delivered in classroom learning. This is a reflection of the successful implementation of character education.No obstacles in the implementation, because the infrastructure is already complete enough that in each class is already available LCD television, VCD player, fan, APE to all areas, and laptops. Although this laptop is a laptop belonging to a teacher, because all the teachers already have a laptop. Principals carry out supervision once every 3 months. Results of supervision will be used as the basis for drafting improvement program and its implementation in the coming semesters.

d) Pertiwi Kindergarten, Cindaga, Banyumas

Implementation of character education in kindergarten Pertiwi Cindaga conducted on Wednesday, with an emphasis emphasis on ethics education and patriotism. Education characters become a major focus of learning for a given character education as early as possible will be the foundation of character formation of students so that they become character generation and berakhlakul karimah. Learning characters starting from the discipline, learning start with a prayer and before class children have to line up one by one to make it more orderly.

Character education based on e-learning and multiple intelegency been implemented because it is the demands of today we all have to follow the development of science and technology, besides this method is suitable for early childhood learning because it can be more interactive. Implementation using existing laptops and LCD, this time TK Pertiwi new Cindaga have 1 piece 1 piece laptop and LCD. For the material, learning CD used procurement by buying. This is because the

teachers no one has the ability to make MPI (Multimedia Interactive Learning). For the implementation of character education based on e-learning and multiple turns intelegency implemented considering the limited facilities and infrastructure owned. Multiple intelligences (multiple intelegency) developed more emphasis on kinesthetic intelligence, interpersonal intelligence, and intrapersonal intelligence.

Before the implementation of the learning takes place, teachers prepare RKH and media required in accordance with the theme of which will be taught on that day. Barriers that often arises is the limited-owned media. Because it is not possible if the same media reused to teach, would be boring. Supervision is done by the principal every 3 months to monitor the implementation of learning.

e) Pembina State Kindergarten of Tegal

Character education becomes the focus of kindergarten education in the State of Trustees of Tegal. It is given that the character became one of the main points in a child's success in the future. To that end, Pembina State TK Tegal implement a program called S3 (day Thousand Only) in which each child was given a tin savings made from former tennis balls. They shall save a thousand coins each day that will be collected to the school at the end of the month. Savings of the child will be collected by schools and manifested in the form of charity lunch for the needy who were around the school. ALMS is done every Friday where the school bought lunch pack and a glass of mineral water, children who will distribute directly to the needy such as pedicab drivers, homeless, scavengers and construction workers they encountered. This activity has been going on for 4 years and already showing results in which many children who then have a high social awareness. Even though there are some children who have gone up to the primary school, still following the S3 program in kindergarten Pembina State Tegal. It is very proud of the school because it means school programs to shape the character of the students already showing results. So the S3 program will be continued as a hallmark of character building program in kindergarten Tegal Pembina State. Because the results of this program is considered good, then Mrs. Principal who also once chairman IGTK Tegal, trying to transmit the program to other schools in Tegal. However, for the implementation depending on each school, want to implement or not.

While the implementation of e-learning-based learning and multiple intelegency, for each class held turns. Although in each classroom is equipped with complete facilities and infrastructure such as laptop, LCD, TV, VCD, fans, etc. This is because power is still small, feared if all classes turn on the laptop and LCD, then the electricity will "njegleg". Learning material emphasizes the character of patriotism while multiple intelligences developed in emphasis kinesthetic intelligence, interpersonal intelligence, intrapersonal intelligence and naturalist intelligence. For learning materials, is still limited to downloading on the internet. While the ability to operate a learning-based e-learning, all teachers are able to implement. Principals obliges all teachers to set aside money teacher certification, used to buy a laptop and to operate a computer course. School head teachers always emphasize the understanding that funds teacher certification is not just to enrich themselves, but it should be emphasized to be used to improve the competence of teachers.

For the provision of school infrastructures, the school did not wait for help from the government, but trying to mobilize and independently so that the infrastructure is in kindergarten Pembina State could be equipped.

f) Aisyiah Kindergarten of Tegal

Karakater education is very important for young children so that they will have good behavior. Character education in early childhood focus on planting the good behavior of children and thus the character education will be imprinted on the child until she was an adult. Schools implement character education through habituation is done every day, talked and talked and when he was playing and their implementation based on the national curriculum and the curriculum foundation. The purpose of the implementation of character education is to train children to behave decently, manners, respect for parents, friends and noble character. For the application to be integrated with learning activities. TK Aisyiah 1 Tegal already implementing character education based on e-learning and multiple intelegency. This is done so that the learning more fun so that students will easily absorb the materials provided for the learning more interesting. As for the provision of facilities and infrastructure, the supply of government aid schools and parents. In practice principals supervision by direct observation with attention to the teacher when giving lessons.

Teachers in implementing character education based on e-learning and multiple intelegency have the skills to do so. The ability of the internet and laptop operationalize obtained through two ways, namely by way of self-taught and through training. Teaching material obtained through procurement assistance from the government and parents. For the preparation of its implementation, teachers set the theme of the search for material on the Internet and then setting up the tool and the material. The result is quite good because students can understand the material given by the teacher and apply them in daily life. In addition, another implication is the child's emotional development is good. Children are more aware of the good and pious deeds, they behave more polite, etc. While the obstacles encountered was the limited facilities and infrastructure, so that the

implementation is only done once a week every Friday for Saturday's class A and class B.

g) Pembina State Kindergarten of Kudus

Patrons of Pembina State Kindergarten of Kudus teachers demanded more professional, where equipment and infrastructure 70% is the result of the work of teachers themselves. Thus, teachers will be more competent. Each teacher makes Prota, RKM and RKH and they will choose the method that is appropriate to the material. For character-based learning e-learning and multiple intelegency, of 18 characters can not all be implemented in accordance with the child's ability as discipline, honesty, and religion.Character education implemented by habituation in everyday life. When learning takes place, teachers have a record of child evaluation, the evaluation will be included in the daily assessment, then monthly assessment and come to the assessment that half entered the summary assessment which will enter the narrative. For a complete infrastructure where for each classroom is equipped with an LCD, TV, VCD player.

Effect of very large character education where the teacher as early as possible will know the potential of students which is distributed in the race. Even recently, one of the students won 1 competition dancing (as a kinesthetic intelligence) provincial level. This is the implication of the successful implementation of character education based on e-learning and multiple intelegency. In addition to storytelling ability (intelligence language) and geguritan (musical intelligence), from students to follow the race at the provincial level.In fact, not only the students who are able to compete at the provincial level, thus gurupun. Bu Diah is the creator dolanan child is capable won at the national level. Of course this is a proof that the Holy Pembina State TK already successfully implement character education based on e-learning and multiple intelegency. Character patriotism already implied by loving culture of the area, Pembina State kindergarten students won one for the race play while singing using the Java language level Central Java.

For procurement advice and infrastructure of government assistance and independently own.Learning material taken from the VCD help from the government and from the purchase itself in the shop and download on the internet. The ability of the teacher in the learning multimedia operationalize obtained by training and courses at their own expense. All teachers already have their own laptop, and even most teachers use the HP smartphone.

There are no significant obstacles faced by the teachers and the schools in implementing character education based on e-learning and multiple intelegency. Supervision is done by the principal two times in the first semester. Results of supervision are used for repairs and basic planning of the implementation of learning in the next semester.

i. *Batik Kindergarten, Kudus*

As one private kindergarten, Batik Kindergarten, Kudus, trying to become early childhood education institutions that promote character education. This is because that character education is very important and very basic. The school always tries to build closeness with students by conducting a home visit so that any problems can be addressed students. Character education implemented by the method of learning by doing. Where teachers become role models for students for example, teachers ask students to use a neat clothing, the teachers wear clothing that is neat as an example for students. Incidentally surrounding communities TK is lower middle income people, the school tried to dive into the character of the community. This will allow the school to implement an appropriate learning method for students.

Learning-based character education e-learning and multiple intelegency implemented by utilizing owned media, although still limited. In addition, sometimes the teacher download the material on the internet. But sometimes, the media in the download does not conform with the wishes of the teacher, then the teacher will modify the off-line media such as media owned concrete objects, media geometry, etc. Thus, students will more easily understand the material presented by the teacher. For multiple intelligences (multiple intelegency) developed more emphasis on kinesthetic intelligence, interpersonal intelligence, intrapersonal intelligence and naturalist intelligence. This is so that students can develop their potential. If children understand but do not understand, of course it is useless. Every day is only open 2 area for children to go deeper in the material provided by the teacher.

IV. Discussion

The character of a nation is an important aspect that affects the socio-economic development. High quality character of the community will surely grow a strong desire to improve the quality of the nation. The key to successful success of a country is determined by the extent to which the public has the character that is conducive to advancing the so-called "social capital" (social capital). So, is not determined by the amount of natural resources or the large number of residents and spacious geoografisnya. In the book Fukuyama stressed the competition that exists today is not the competition between ideology system. However, competition between countries that have a high social capital. Countries that have a high social capital is high society a sense of togetherness, mutual trust (vertical or horizontal), and low levels of conflict in the country. Social capital can be realized if each individual can uphold togetherness, loyalty, honesty, hard work and obligations.

Quality characters need to be established and nurtured from an early age. Early childhood is a critical period for the establishment of a person's character, moral cultivation through character education as early as mengkin to children is the key to building the nation. According to experts the study of children in the development of the human brain (neouroscience) where at an early age in children are not given the education, upbringing, good stimulation will affect the structure of brain development, this happens because the brain development occurs very rapidly under the age of 7 years where 90 percent of the brain is formed at this age.

Character development is best if started at an early age. A phrase that is widely believed to declare "if we fail to be good at an early age, in adulthood we would be troubled person or a bad person".

Character is derived from the Greek word meaning charassein carve forming a pattern means to have good character is not automatically belong to every human being so he was born but requires a long process through parenting and education. The child will grow into a character can be realized if children grow within the character, the nature of the holy child born can is developed optimally, it requires the participation of all the families, schools and all components in society example religious institutions, sports associations, the business community and others. Therefore the character education in schools, especially kindergarten and elementary school also needs to be done of course in accordance with the stage of development of the child's age.

Learning is defined as a deliberate effort by educators to support student learning activities. In general, the learning issues in early childhood include:

a) Learning, playing, singing. In this case study prepared by developing the essence of play
b) Learning life skills. Social skills are skills possessed were a man to dare to face the problems of life and natural life with no feeling depressed, then proactively and creatively search for and find a solution to the solution (MONE, 2002).
c) Learning from concrete objects. At an early age children in the sensory motor stage to pre-operational and children learn best from real objects
d) Integrated Learning. Learning unfounded subjects but integrated with themes based on specific (thematic). Basic themes selected from the everyday events experienced by, for example: water, sand, animals, sky, rain etc. Basic theme can be developed into a sub-theme, the theme is developed into a fountain water, river water, drinking water, sea water, rain water.

With regard to learning in kindergarten, a model of a model teaching program pembejaran the contents of various programs and learning activities that use a variety of methods. In a literature review found there are 2 major models in the learning program for children of early age, namely:

a) Learning Model Cooperative (Cooperative Learning)

This model is intended that educators can become facilitators in the learning activities and can help students become independent learners (Halpern, 2005). Besides believed to increase student achievement, this model is also an alternative to the traditional model of teaching load filled with various instructions of the educator (Siegel, 2005). During use cooperative learning model, children are actively involved with other children and learning materials. The successful implementation of this model is the activity or program should be planned, organized, and structured with tasks related to the goals of learning (Halpern, 005). *As for some form of this model are*

1) Discussion in pairs to exchange mind.
2) Gather information that is a lot in a short time by dividing groups of students.
3) Playing the role (role playing), children play social skills.
4) Playing with the search for traces (maze or maps).

b) Social cognitive learning model (Cognitive-social learning model)

The purpose of this model is to improve the social skills of children through social cognitive learning effective strategies to provide opportunities for children to practice social behavior in various social contexts. At each learning session, there are three social skills was introduced (using annotations, the child's opinion, and non-verbal expressions displayed when social skills appear). This learning model is divided 5 continuous sessions with different situations presented. The first session, in situations when the child wants to play with other children.Second session, how they can convey an idea or activity that is desired.Third session, children dibelajarkan how attitudes and positive way among friends. The fourth session, children dibelajarkan how he can share toys with other children.As well as the fifth session dibelajarkan children how they can solve the problem of natural various conflict situations. The purpose of the first session is to help the child to take the initiative in forming positive social interaction with peers. While other sessions is to keep the child can maintain positive social relationships with peers.As described in the findings of the research, the implementation of character education based on e-learning and multiple intelegency in all schools that the research samples combining the two models above. Where the use of cooperative learning model, children are actively involved with other children and learning materials. The successful implementation of this model is the activity or program should be planned, organized, and structured with tasks related to the objectives of learning and improving social skills of children through

social cognitive learning strategies effectively by providing the opportunity for children to practice social behavior in wide variety of social contexts.

c) The development of character education in early childhood based on e-learning and multiple intelegency in Central Java

1) Procedures and measures the development of character education in schools.To realize the character education in all school activities, do the following steps:a) Select and determine the values are prioritized to be developed based on the results of the analysis of the context by considering the availability of facilities and conditions. b) The head of the school to disseminate to all schools so that all citizens of the school community have a shared commitment to realize the formation of character through the values prioritized.c) To disseminate to parents of students and school committee to support the implementation of character education and synchronize the implementation of character education at school and at home or in the local communities.
2) Planning and Implementation Culture-Based Character Education Program Java

a) Planning Phase

At the beginning of activities throughout kindergarten, using a curriculum that serves as a reference for activities performed. This curriculum is a curriculum prepared by the Centre. In this curriculum already contains a range of values that should be developed, namely in the field of development through the establishment of habituation behavior. The value of the priority is hygiene, religious, independence, care for the environment, tolerance. The selected values outlined in the Vision, Mission, and Goals school.

b) Implementation Phase

For the implementation of character education based on e-learning and multiple intelegency, first made learning plan to pack the good and the quality of learning, where teachers make RKH (Daily Activity Plan). There are 10 centers of learning were developed, namely: (a) preparation center number, (b) preparation center number, (c) solid nature centers, (d) liquefied natural centers, (e) centers IMTAQ, (f) the center of the beam, (g) centers play a role, (h) center for English, (i) the center of the arts, and (j) the center of the body.

Implementation of character-based learning e-learning and multiple intelegency in the same kindergarten with learning on weekdays, only its implementation tailored to the availability of facilities and infrastructure of each school.

c) Evaluation Stage

For the evaluation of the activities carried out regularly by the principal. Teachers only observe the student's mastery of the material-based character education e-learning and multiple intelegency.

References Références Referencias

1. Borba, Michele. 2008. Building Moral Intelligence: The Seven Virtues Key To High Moral Child. Tr.By Lina Jusur. Jakarta : PT. Gramedia Pustaka Utama
2. Burhan, Bungin. 2001. Qualitative Research Methods: Actualization methodology to Direction Variety Varian Contemporary. Jakarta : PT. Raja Grafindo Persada
3. Depdiknas. 2004. Character Development School. Jakarta : Depdiknas RI
4. Doni Koesoema. A. 2007. Character Education: Educating Children Strategies in the Global Age. Jakarta : Grasindo. Cetakan Pertama
5. Kemdiknas. (2010). Parent Book Character Development. Jakarta.
6. Kemdiknas. (2010). Character Education Parent design (pp. 8-9).Jakarta.
7. Kemdiknas. (2010). National Action Plan for Character Education. Jakarta.
8. Pusat Kurikulum. (2009). Development and Education Culture and National Character: Guidelines for Schools (pp. 9-10). Jakarta.
9. Nasution. 1980. Qualitative Research MethodsBandung : Tarsito
10. Suryabrata, Sumadi. 1990. Methodology of Research (fifth edition).Jakarta : Rajawali

Global Journals Inc. (US) Guidelines Handbook 2015

www.GlobalJournals.org

FELLOW OF ASSOCIATION OF RESEARCH SOCIETY IN COMPUTING (FARSC)

Global Journals Incorporate (USA) is accredited by Open Association of Research Society (OARS), U.S.A and in turn, awards "FARSC" title to individuals. The 'FARSC' title is accorded to a selected professional after the approval of the Editor-in-Chief/Editorial Board Members/Dean.

- The "FARSC" is a dignified title which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., FARSC or William Walldroff, M.S., FARSC.

FARSC accrediting is an honor. It authenticates your research activities. After recognition as FARSC, you can add 'FARSC' title with your name as you use this recognition as additional suffix to your status. This will definitely enhance and add more value and repute to your name. You may use it on your professional Counseling Materials such as CV, Resume, and Visiting Card etc.

The following benefits can be availed by you only for next three years from the date of certification:

FARSC designated members are entitled to avail a 40% discount while publishing their research papers (of a single author) with Global Journals Incorporation (USA), if the same is accepted by Editorial Board/Peer Reviewers. If you are a main author or co-author in case of multiple authors, you will be entitled to avail discount of 10%.

Once FARSC title is accorded, the Fellow is authorized to organize a symposium/seminar/conference on behalf of Global Journal Incorporation (USA).The Fellow can also participate in conference/seminar/symposium organized by another institution as representative of Global Journal. In both the cases, it is mandatory for him to discuss with us and obtain our consent.

You may join as member of the Editorial Board of Global Journals Incorporation (USA) after successful completion of three years as Fellow and as Peer Reviewer. In addition, it is also desirable that you should organize seminar/symposium/conference at least once.

We shall provide you intimation regarding launching of e-version of journal of your stream time to time. This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

The FARSC can go through standards of OARS. You can also play vital role if you have any suggestions so that proper amendment can take place to improve the same for the benefit of entire research community.

As FARSC, you will be given a renowned, secure and free professional email address with 100 GB of space e.g. johnhall@globaljournals.org. This will include Webmail, Spam Assassin, Email Forwarders, Auto-Responders, Email Delivery Route tracing, etc.

The FARSC will be eligible for a free application of standardization of their researches. Standardization of research will be subject to acceptability within stipulated norms as the next step after publishing in a journal. We shall depute a team of specialized research professionals who will render their services for elevating your researches to next higher level, which is worldwide open standardization.

The FARSC member can apply for grading and certification of standards of their educational and Institutional Degrees to Open Association of Research, Society U.S.A. Once you are designated as FARSC, you may send us a scanned copy of all of your credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria. After certification of all your credentials by OARS, they will be published on your Fellow Profile link on website https://associationofresearch.org which will be helpful to upgrade the dignity.

The FARSC members can avail the benefits of free research podcasting in Global Research Radio with their research documents. After publishing the work, (including published elsewhere worldwide with proper authorization) you can upload your research paper with your recorded voice or you can utilize chargeable services of our professional RJs to record your paper in their voice on request.

The FARSC member also entitled to get the benefits of free research podcasting of their research documents through video clips. We can also streamline your conference videos and display your slides/ online slides and online research video clips at reasonable charges, on request.

The FARSC is eligible to earn from sales proceeds of his/her researches/reference/review Books or literature, while publishing with Global Journals. The FARSC can decide whether he/she would like to publish his/her research in a closed manner. In this case, whenever readers purchase that individual research paper for reading, maximum 60% of its profit earned as royalty by Global Journals, will be credited to his/her bank account. The entire entitled amount will be credited to his/her bank account exceeding limit of minimum fixed balance. There is no minimum time limit for collection. The FARSC member can decide its price and we can help in making the right decision.

The FARSC member is eligible to join as a paid peer reviewer at Global Journals Incorporation (USA) and can get remuneration of 15% of author fees, taken from the author of a respective paper. After reviewing 5 or more papers you can request to transfer the amount to your bank account.

MEMBER OF ASSOCIATION OF RESEARCH SOCIETY IN COMPUTING (MARSC)

The ' MARSC ' title is accorded to a selected professional after the approval of the Editor-in-Chief / Editorial Board Members/Dean.
The “MARSC” is a dignified ornament which is accorded to a person’s name viz. Dr. John E. Hall, Ph.D., MARSC or William Walldroff, M.S., MARSC.

MARSC accrediting is an honor. It authenticates your research activities. After becoming MARSC, you can add 'MARSC' title with your name as you use this recognition as additional suffix to your status. This will definitely enhance and add more value and repute to your name. You may use it on your professional Counseling Materials such as CV, Resume, Visiting Card and Name Plate etc.

The following benefitscan be availed by you only for next three years from the date of certification.

MARSC designated members are entitled to avail a 25% discount while publishing their research papers (of a single author) in Global Journals Inc., if the same is accepted by our Editorial Board and Peer Reviewers. If you are a main author or co-author of a group of authors, you will get discount of 10%.

As MARSC, you will be given a renowned, secure and free professional email address with 30 GB of space e.g. johnhall@globaljournals.org. This will include Webmail, Spam Assassin, Email Forwarders, Auto-Responders, Email Delivery Route tracing, etc.

We shall provide you intimation regarding launching of e-version of journal of your stream time to time. This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

The MARSC member can apply for approval, grading and certification of standards of their educational and Institutional Degrees to Open Association of Research, Society U.S.A.

Once you are designated as MARSC, you may send us a scanned copy of all of your credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria.

It is mandatory to read all terms and conditions carefully.

AUXILIARY MEMBERSHIPS

Institutional Fellow of Open Association of Research Society (USA)-OARS (USA)

Global Journals Incorporation (USA) is accredited by Open Association of Research Society, U.S.A (OARS) and in turn, affiliates research institutions as "Institutional Fellow of Open Association of Research Society" (IFOARS).

The "FARSC" is a dignified title which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., FARSC or William Walldroff, M.S., FARSC.

The IFOARS institution is entitled to form a Board comprised of one Chairperson and three to five board members preferably from different streams. The Board will be recognized as "Institutional Board of Open Association of Research Society"-(IBOARS).

The Institute will be entitled to following benefits:

The IBOARS can initially review research papers of their institute and recommend them to publish with respective journal of Global Journals. It can also review the papers of other institutions after obtaining our consent. The second review will be done by peer reviewer of Global Journals Incorporation (USA) The Board is at liberty to appoint a peer reviewer with the approval of chairperson after consulting us.

The author fees of such paper may be waived off up to 40%.

The Global Journals Incorporation (USA) at its discretion can also refer double blind peer reviewed paper at their end to the board for the verification and to get recommendation for final stage of acceptance of publication.

The IBOARS can organize symposium/seminar/conference in their country on behalf of Global Journals Incorporation (USA)-OARS (USA). The terms and conditions can be discussed separately.

The Board can also play vital role by exploring and giving valuable suggestions regarding the Standards of "Open Association of Research Society, U.S.A (OARS)" so that proper amendment can take place for the benefit of entire research community. We shall provide details of particular standard only on receipt of request from the Board.

The board members can also join us as Individual Fellow with 40% discount on total fees applicable to Individual Fellow. They will be entitled to avail all the benefits as declared. Please visit Individual Fellow-sub menu of GlobalJournals.org to have more relevant details.

We shall provide you intimation regarding launching of e-version of journal of your stream time to time. This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

After nomination of your institution as "Institutional Fellow" and constantly functioning successfully for one year, we can consider giving recognition to your institute to function as Regional/Zonal office on our behalf.
The board can also take up the additional allied activities for betterment after our consultation.

The following entitlements are applicable to individual Fellows:

Open Association of Research Society, U.S.A (OARS) By-laws states that an individual Fellow may use the designations as applicable, or the corresponding initials. The Credentials of individual Fellow and Associate designations signify that the individual has gained knowledge of the fundamental concepts. One is magnanimous and proficient in an expertise course covering the professional code of conduct, and follows recognized standards of practice.

Open Association of Research Society (US)/ Global Journals Incorporation (USA), as described in Corporate Statements, are educational, research publishing and professional membership organizations. Achieving our individual Fellow or Associate status is based mainly on meeting stated educational research requirements.

Disbursement of 40% Royalty earned through Global Journals : Researcher = 50%, Peer Reviewer = 37.50%, Institution = 12.50% E.g. Out of 40%, the 20% benefit should be passed on to researcher, 15 % benefit towards remuneration should be given to a reviewer and remaining 5% is to be retained by the institution.

We shall provide print version of 12 issues of any three journals [as per your requirement] out of our 38 journals worth $ 2376 USD.

Other:

The individual Fellow and Associate designations accredited by Open Association of Research Society (US) credentials signify guarantees following achievements:

- The professional accredited with Fellow honor, is entitled to various benefits viz. name, fame, honor, regular flow of income, secured bright future, social status etc.

- In addition to above, if one is single author, then entitled to 40% discount on publishing research paper and can get 10%discount if one is co-author or main author among group of authors.
- The Fellow can organize symposium/seminar/conference on behalf of Global Journals Incorporation (USA) and he/she can also attend the same organized by other institutes on behalf of Global Journals.
- The Fellow can become member of Editorial Board Member after completing 3yrs.
- The Fellow can earn 60% of sales proceeds from the sale of reference/review books/literature/publishing of research paper.
- Fellow can also join as paid peer reviewer and earn 15% remuneration of author charges and can also get an opportunity to join as member of the Editorial Board of Global Journals Incorporation (USA)
- • This individual has learned the basic methods of applying those concepts and techniques to common challenging situations. This individual has further demonstrated an in–depth understanding of the application of suitable techniques to a particular area of research practice.

Note :

"

- In future, if the board feels the necessity to change any board member, the same can be done with the consent of the chairperson along with anyone board member without our approval.
- In case, the chairperson needs to be replaced then consent of 2/3rd board members are required and they are also required to jointly pass the resolution copy of which should be sent to us. In such case, it will be compulsory to obtain our approval before replacement.
- In case of "Difference of Opinion [if any]" among the Board members, our decision will be final and binding to everyone.

"

Process of submission of Research Paper

The Area or field of specialization may or may not be of any category as mentioned in 'Scope of Journal' menu of the GlobalJournals.org website. There are 37 Research Journal categorized with Six parental Journals GJCST, GJMR, GJRE, GJMBR, GJSFR, GJHSS. For Authors should prefer the mentioned categories. There are three widely used systems UDC, DDC and LCC. The details are available as 'Knowledge Abstract' at Home page. The major advantage of this coding is that, the research work will be exposed to and shared with all over the world as we are being abstracted and indexed worldwide.

The paper should be in proper format. The format can be downloaded from first page of 'Author Guideline' Menu. The Author is expected to follow the general rules as mentioned in this menu. The paper should be written in MS-Word Format (*.DOC,*.DOCX).

The Author can submit the paper either online or offline. The authors should prefer online submission.Online Submission: There are three ways to submit your paper:

(A) (I) First, register yourself using top right corner of Home page then Login. If you are already registered, then login using your username and password.

(II) Choose corresponding Journal.

(III) Click 'Submit Manuscript'. Fill required information and Upload the paper.

(B) If you are using Internet Explorer, then Direct Submission through Homepage is also available.

(C) If these two are not convenient, and then email the paper directly to dean@globaljournals.org.

Offline Submission: Author can send the typed form of paper by Post. However, online submission should be preferred.

Preferred Author Guidelines

MANUSCRIPT STYLE INSTRUCTION (Must be strictly followed)

Page Size: 8.27" X 11'"

- Left Margin: 0.65
- Right Margin: 0.65
- Top Margin: 0.75
- Bottom Margin: 0.75
- Font type of all text should be Swis 721 Lt BT.
- Paper Title should be of Font Size 24 with one Column section.
- Author Name in Font Size of 11 with one column as of Title.
- Abstract Font size of 9 Bold, "Abstract" word in Italic Bold.
- Main Text: Font size 10 with justified two columns section
- Two Column with Equal Column with of 3.38 and Gaping of .2
- First Character must be three lines Drop capped.
- Paragraph before Spacing of 1 pt and After of 0 pt.
- Line Spacing of 1 pt
- Large Images must be in One Column
- Numbering of First Main Headings (Heading 1) must be in Roman Letters, Capital Letter, and Font Size of 10.
- Numbering of Second Main Headings (Heading 2) must be in Alphabets, Italic, and Font Size of 10.

You can use your own standard format also.
Author Guidelines:

1. General,

2. Ethical Guidelines,

3. Submission of Manuscripts,

4. Manuscript's Category,

5. Structure and Format of Manuscript,

6. After Acceptance.

1. GENERAL

Before submitting your research paper, one is advised to go through the details as mentioned in following heads. It will be beneficial, while peer reviewer justify your paper for publication.

Scope

The Global Journals Inc. (US) welcome the submission of original paper, review paper, survey article relevant to the all the streams of Philosophy and knowledge. The Global Journals Inc. (US) is parental platform for Global Journal of Computer Science and Technology, Researches in Engineering, Medical Research, Science Frontier Research, Human Social Science, Management, and Business organization. The choice of specific field can be done otherwise as following in Abstracting and Indexing Page on this Website. As the all Global

Journals Inc. (US) are being abstracted and indexed (in process) by most of the reputed organizations. Topics of only narrow interest will not be accepted unless they have wider potential or consequences.

2. ETHICAL GUIDELINES

Authors should follow the ethical guidelines as mentioned below for publication of research paper and research activities.

Papers are accepted on strict understanding that the material in whole or in part has not been, nor is being, considered for publication elsewhere. If the paper once accepted by Global Journals Inc. (US) and Editorial Board, will become the copyright of the Global Journals Inc. (US).

Authorship: The authors and coauthors should have active contribution to conception design, analysis and interpretation of findings. They should critically review the contents and drafting of the paper. All should approve the final version of the paper before submission

The Global Journals Inc. (US) follows the definition of authorship set up by the Global Academy of Research and Development. According to the Global Academy of R&D authorship, criteria must be based on:

1) Substantial contributions to conception and acquisition of data, analysis and interpretation of the findings.

2) Drafting the paper and revising it critically regarding important academic content.

3) Final approval of the version of the paper to be published.

All authors should have been credited according to their appropriate contribution in research activity and preparing paper. Contributors who do not match the criteria as authors may be mentioned under Acknowledgement.

Acknowledgements: Contributors to the research other than authors credited should be mentioned under acknowledgement. The specifications of the source of funding for the research if appropriate can be included. Suppliers of resources may be mentioned along with address.

Appeal of Decision: The Editorial Board's decision on publication of the paper is final and cannot be appealed elsewhere.

Permissions: It is the author's responsibility to have prior permission if all or parts of earlier published illustrations are used in this paper.

Please mention proper reference and appropriate acknowledgements wherever expected.

If all or parts of previously published illustrations are used, permission must be taken from the copyright holder concerned. It is the author's responsibility to take these in writing.

Approval for reproduction/modification of any information (including figures and tables) published elsewhere must be obtained by the authors/copyright holders before submission of the manuscript. Contributors (Authors) are responsible for any copyright fee involved.

3. SUBMISSION OF MANUSCRIPTS

Manuscripts should be uploaded via this online submission page. The online submission is most efficient method for submission of papers, as it enables rapid distribution of manuscripts and consequently speeds up the review procedure. It also enables authors to know the status of their own manuscripts by emailing us. Complete instructions for submitting a paper is available below.

Manuscript submission is a systematic procedure and little preparation is required beyond having all parts of your manuscript in a given format and a computer with an Internet connection and a Web browser. Full help and instructions are provided on-screen. As an author, you will be prompted for login and manuscript details as Field of Paper and then to upload your manuscript file(s) according to the instructions.

To avoid postal delays, all transaction is preferred by e-mail. A finished manuscript submission is confirmed by e-mail immediately and your paper enters the editorial process with no postal delays. When a conclusion is made about the publication of your paper by our Editorial Board, revisions can be submitted online with the same procedure, with an occasion to view and respond to all comments.

Complete support for both authors and co-author is provided.

4. MANUSCRIPT'S CATEGORY

Based on potential and nature, the manuscript can be categorized under the following heads:

Original research paper: Such papers are reports of high-level significant original research work.

Review papers: These are concise, significant but helpful and decisive topics for young researchers.

Research articles: These are handled with small investigation and applications.

Research letters: The letters are small and concise comments on previously published matters.

5. STRUCTURE AND FORMAT OF MANUSCRIPT

The recommended size of original research paper is less than seven thousand words, review papers fewer than seven thousands words also.Preparation of research paper or how to write research paper, are major hurdle, while writing manuscript. The research articles and research letters should be fewer than three thousand words, the structure original research paper; sometime review paper should be as follows:

Papers: These are reports of significant research (typically less than 7000 words equivalent, including tables, figures, references), and comprise:

(a)Title should be relevant and commensurate with the theme of the paper.

(b) A brief Summary, "Abstract" (less than 150 words) containing the major results and conclusions.

(c) Up to ten keywords, that precisely identifies the paper's subject, purpose, and focus.

(d) An Introduction, giving necessary background excluding subheadings; objectives must be clearly declared.

(e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition; sources of information must be given and numerical methods must be specified by reference, unless non-standard.

(f) Results should be presented concisely, by well-designed tables and/or figures; the same data may not be used in both; suitable statistical data should be given. All data must be obtained with attention to numerical detail in the planning stage. As reproduced design has been recognized to be important to experiments for a considerable time, the Editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned un-refereed;

(g) Discussion should cover the implications and consequences, not just recapitulating the results; conclusions should be summarizing.

(h) Brief Acknowledgements.

(i) References in the proper form.

Authors should very cautiously consider the preparation of papers to ensure that they communicate efficiently. Papers are much more likely to be accepted, if they are cautiously designed and laid out, contain few or no errors, are summarizing, and be conventional to the approach and instructions. They will in addition, be published with much less delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and to make suggestions to improve briefness.

It is vital, that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

Format

Language: The language of publication is UK English. Authors, for whom English is a second language, must have their manuscript efficiently edited by an English-speaking person before submission to make sure that, the English is of high excellence. It is preferable, that manuscripts should be professionally edited.

Standard Usage, Abbreviations, and Units: Spelling and hyphenation should be conventional to The Concise Oxford English Dictionary. Statistics and measurements should at all times be given in figures, e.g. 16 min, except for when the number begins a sentence. When the number does not refer to a unit of measurement it should be spelt in full unless, it is 160 or greater.

Abbreviations supposed to be used carefully. The abbreviated name or expression is supposed to be cited in full at first usage, followed by the conventional abbreviation in parentheses.

Metric SI units are supposed to generally be used excluding where they conflict with current practice or are confusing. For illustration, 1.4 l rather than 1.4 × 10-3 m3, or 4 mm somewhat than 4 × 10-3 m. Chemical formula and solutions must identify the form used, e.g. anhydrous or hydrated, and the concentration must be in clearly defined units. Common species names should be followed by underlines at the first mention. For following use the generic name should be constricted to a single letter, if it is clear.

Structure

All manuscripts submitted to Global Journals Inc. (US), ought to include:

Title: The title page must carry an instructive title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) wherever the work was carried out. The full postal address in addition with the e-mail address of related author must be given. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining and indexing.

Abstract, used in Original Papers and Reviews:

Optimizing Abstract for Search Engines

Many researchers searching for information online will use search engines such as Google, Yahoo or similar. By optimizing your paper for search engines, you will amplify the chance of someone finding it. This in turn will make it more likely to be viewed and/or cited in a further work. Global Journals Inc. (US) have compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Key Words

A major linchpin in research work for the writing research paper is the keyword search, which one will employ to find both library and Internet resources.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy and planning a list of possible keywords and phrases to try.

Search engines for most searches, use Boolean searching, which is somewhat different from Internet searches. The Boolean search uses "operators," words (and, or, not, and near) that enable you to expand or narrow your affords. Tips for research paper while preparing research paper are very helpful guideline of research paper.

Choice of key words is first tool of tips to write research paper. Research paper writing is an art.A few tips for deciding as strategically as possible about keyword search:

- One should start brainstorming lists of possible keywords before even begin searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in research paper?" Then consider synonyms for the important words.
- It may take the discovery of only one relevant paper to let steer in the right keyword direction because in most databases, the keywords under which a research paper is abstracted are listed with the paper.
- One should avoid outdated words.

Keywords are the key that opens a door to research work sources. Keyword searching is an art in which researcher's skills are bound to improve with experience and time.

Numerical Methods: Numerical methods used should be clear and, where appropriate, supported by references.

Acknowledgements: Please make these as concise as possible.

References

References follow the Harvard scheme of referencing. References in the text should cite the authors' names followed by the time of their publication, unless there are three or more authors when simply the first author's name is quoted followed by et al. unpublished work has to only be cited where necessary, and only in the text. Copies of references in press in other journals have to be supplied with submitted typescripts. It is necessary that all citations and references be carefully checked before submission, as mistakes or omissions will cause delays.

References to information on the World Wide Web can be given, but only if the information is available without charge to readers on an official site. Wikipedia and Similar websites are not allowed where anyone can change the information. Authors will be asked to make available electronic copies of the cited information for inclusion on the Global Journals Inc. (US) homepage at the judgment of the Editorial Board.

The Editorial Board and Global Journals Inc. (US) recommend that, citation of online-published papers and other material should be done via a DOI (digital object identifier). If an author cites anything, which does not have a DOI, they run the risk of the cited material not being noticeable.

The Editorial Board and Global Journals Inc. (US) recommend the use of a tool such as Reference Manager for reference management and formatting.

Tables, Figures and Figure Legends

Tables: Tables should be few in number, cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g. Table 4, a self-explanatory caption and be on a separate sheet. Vertical lines should not be used.

Figures: Figures are supposed to be submitted as separate files. Always take in a citation in the text for each figure using Arabic numbers, e.g. Fig. 4. Artwork must be submitted online in electronic form by e-mailing them.

Preparation of Electronic Figures for Publication

Even though low quality images are sufficient for review purposes, print publication requires high quality images to prevent the final product being blurred or fuzzy. Submit (or e-mail) EPS (line art) or TIFF (halftone/photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Do not use pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings) in relation to the imitation size. Please give the data for figures in black and white or submit a Color Work Agreement Form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution (at final image size) ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs) : >350 dpi; figures containing both halftone and line images: >650 dpi.

Color Charges: It is the rule of the Global Journals Inc. (US) for authors to pay the full cost for the reproduction of their color artwork. Hence, please note that, if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a color work agreement form before your paper can be published.

Figure Legends: Self-explanatory legends of all figures should be incorporated separately under the heading 'Legends to Figures'. In the full-text online edition of the journal, figure legends may possibly be truncated in abbreviated links to the full screen version. Therefore, the first 100 characters of any legend should notify the reader, about the key aspects of the figure.

6. AFTER ACCEPTANCE

Upon approval of a paper for publication, the manuscript will be forwarded to the dean, who is responsible for the publication of the Global Journals Inc. (US).

6.1 Proof Corrections

The corresponding author will receive an e-mail alert containing a link to a website or will be attached. A working e-mail address must therefore be provided for the related author.

Acrobat Reader will be required in order to read this file. This software can be downloaded

(Free of charge) from the following website:

www.adobe.com/products/acrobat/readstep2.html. This will facilitate the file to be opened, read on screen, and printed out in order for any corrections to be added. Further instructions will be sent with the proof.

Proofs must be returned to the dean at dean@globaljournals.org within three days of receipt.

As changes to proofs are costly, we inquire that you only correct typesetting errors. All illustrations are retained by the publisher. Please note that the authors are responsible for all statements made in their work, including changes made by the copy editor.

6.2 Early View of Global Journals Inc. (US) (Publication Prior to Print)

The Global Journals Inc. (US) are enclosed by our publishing's Early View service. Early View articles are complete full-text articles sent in advance of their publication. Early View articles are absolute and final. They have been completely reviewed, revised and edited for publication, and the authors' final corrections have been incorporated. Because they are in final form, no changes can be made after sending them. The nature of Early View articles means that they do not yet have volume, issue or page numbers, so Early View articles cannot be cited in the conventional way.

6.3 Author Services

Online production tracking is available for your article through Author Services. Author Services enables authors to track their article - once it has been accepted - through the production process to publication online and in print. Authors can check the status of their articles online and choose to receive automated e-mails at key stages of production. The authors will receive an e-mail with a unique link that enables them to register and have their article automatically added to the system. Please ensure that a complete e-mail address is provided when submitting the manuscript.

6.4 Author Material Archive Policy

Please note that if not specifically requested, publisher will dispose off hardcopy & electronic information submitted, after the two months of publication. If you require the return of any information submitted, please inform the Editorial Board or dean as soon as possible.

6.5 Offprint and Extra Copies

A PDF offprint of the online-published article will be provided free of charge to the related author, and may be distributed according to the Publisher's terms and conditions. Additional paper offprint may be ordered by emailing us at: editor@globaljournals.org .

You must strictly follow above Author Guidelines before submitting your paper or else we will not at all be responsible for any corrections in future in any of the way.

Before start writing a good quality Computer Science Research Paper, let us first understand what is Computer Science Research Paper? So, Computer Science Research Paper is the paper which is written by professionals or scientists who are associated to Computer Science and Information Technology, or doing research study in these areas. If you are novel to this field then you can consult about this field from your supervisor or guide.

TECHNIQUES FOR WRITING A GOOD QUALITY RESEARCH PAPER:

1. Choosing the topic: In most cases, the topic is searched by the interest of author but it can be also suggested by the guides. You can have several topics and then you can judge that in which topic or subject you are finding yourself most comfortable. This can be done by asking several questions to yourself, like Will I be able to carry our search in this area? Will I find all necessary recourses to accomplish the search? Will I be able to find all information in this field area? If the answer of these types of questions will be "Yes" then you can choose that topic. In most of the cases, you may have to conduct the surveys and have to visit several places because this field is related to Computer Science and Information Technology. Also, you may have to do a lot of work to find all rise and falls regarding the various data of that subject. Sometimes, detailed information plays a vital role, instead of short information.

2. Evaluators are human: First thing to remember that evaluators are also human being. They are not only meant for rejecting a paper. They are here to evaluate your paper. So, present your Best.

3. Think Like Evaluators: If you are in a confusion or getting demotivated that your paper will be accepted by evaluators or not, then think and try to evaluate your paper like an Evaluator. Try to understand that what an evaluator wants in your research paper and automatically you will have your answer.

4. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

5. Ask your Guides: If you are having any difficulty in your research, then do not hesitate to share your difficulty to your guide (if you have any). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work then ask the supervisor to help you with the alternative. He might also provide you the list of essential readings.

6. Use of computer is recommended: As you are doing research in the field of Computer Science, then this point is quite obvious.

7. Use right software: Always use good quality software packages. If you are not capable to judge good software then you can lose quality of your paper unknowingly. There are various software programs available to help you, which you can get through Internet.

8. Use the Internet for help: An excellent start for your paper can be by using the Google. It is an excellent search engine, where you can have your doubts resolved. You may also read some answers for the frequent question how to write my research paper or find model research paper. From the internet library you can download books. If you have all required books make important reading selecting and analyzing the specified information. Then put together research paper sketch out.

9. Use and get big pictures: Always use encyclopedias, Wikipedia to get pictures so that you can go into the depth.

10. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right! It is a good habit, which helps to not to lose your continuity. You should always use bookmarks while searching on Internet also, which will make your search easier.

11. Revise what you wrote: When you write anything, always read it, summarize it and then finalize it.

12. Make all efforts: Make all efforts to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in introduction, that what is the need of a particular research paper. Polish your work by good skill of writing and always give an evaluator, what he wants.

13. Have backups: When you are going to do any important thing like making research paper, you should always have backup copies of it either in your computer or in paper. This will help you to not to lose any of your important.

14. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several and unnecessary diagrams will degrade the quality of your paper by creating "hotchpotch." So always, try to make and include those diagrams, which are made by your own to improve readability and understandability of your paper.

15. Use of direct quotes: When you do research relevant to literature, history or current affairs then use of quotes become essential but if study is relevant to science then use of quotes is not preferable.

16. Use proper verb tense: Use proper verb tenses in your paper. Use past tense, to present those events that happened. Use present tense to indicate events that are going on. Use future tense to indicate future happening events. Use of improper and wrong tenses will confuse the evaluator. Avoid the sentences that are incomplete.

17. Never use online paper: If you are getting any paper on Internet, then never use it as your research paper because it might be possible that evaluator has already seen it or maybe it is outdated version.

18. Pick a good study spot: To do your research studies always try to pick a spot, which is quiet. Every spot is not for studies. Spot that suits you choose it and proceed further.

19. Know what you know: Always try to know, what you know by making objectives. Else, you will be confused and cannot achieve your target.

20. Use good quality grammar: Always use a good quality grammar and use words that will throw positive impact on evaluator. Use of good quality grammar does not mean to use tough words, that for each word the evaluator has to go through dictionary. Do not start sentence with a conjunction. Do not fragment sentences. Eliminate one-word sentences. Ignore passive voice. Do not ever use a big word when a diminutive one would suffice. Verbs have to be in agreement with their subjects. Prepositions are not expressions to finish sentences with. It is incorrect to ever divide an infinitive. Avoid clichés like the disease. Also, always shun irritating alliteration. Use language that is simple and straight forward. put together a neat summary.

21. Arrangement of information: Each section of the main body should start with an opening sentence and there should be a changeover at the end of the section. Give only valid and powerful arguments to your topic. You may also maintain your arguments with records.

22. Never start in last minute: Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

23. Multitasking in research is not good: Doing several things at the same time proves bad habit in case of research activity. Research is an area, where everything has a particular time slot. Divide your research work in parts and do particular part in particular time slot.

24. Never copy others' work: Never copy others' work and give it your name because if evaluator has seen it anywhere you will be in trouble.

25. Take proper rest and food: No matter how many hours you spend for your research activity, if you are not taking care of your health then all your efforts will be in vain. For a quality research, study is must, and this can be done by taking proper rest and food.

26. Go for seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

27. Refresh your mind after intervals: Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

28. Make colleagues: Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

29. Think technically: Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

30. Think and then print: When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

31. Adding unnecessary information: Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

32. Never oversimplify everything: To add material in your research paper, never go for oversimplification. This will definitely irritate the evaluator. Be more or less specific. Also too, by no means, ever use rhythmic redundancies. Contractions aren't essential and shouldn't be there used. Comparisons are as terrible as clichés. Give up ampersands and abbreviations, and so on. Remove commas, that are, not necessary. Parenthetical words however should be together with this in commas. Understatement is all the time the complete best way to put onward earth-shaking thoughts. Give a detailed literary review.

33. Report concluded results: Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

34. After conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

Final Points:

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

Writing a research paper is not an easy job no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record keeping are the only means to make straightforward the progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear

· Adhere to recommended page limits

Mistakes to evade

- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

In every sections of your document

· Use standard writing style including articles ("a", "the," etc.)

· Keep on paying attention on the research topic of the paper

· Use paragraphs to split each significant point (excluding for the abstract)

· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

· Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives

· Shun use of extra pictures - include only those figures essential to presenting results

Title Page:

Choose a revealing title. It should be short. It should not have non-standard acronyms or abbreviations. It should not exceed two printed lines. It should include the name(s) and address (es) of all authors.

Abstract:

The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript--must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing references at this point.

An abstract is a brief distinct paragraph summary of finished work or work in development. In a minute or less a reviewer can be taught the foundation behind the study, common approach to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Yet, use comprehensive sentences and do not let go readability for briefness. You can maintain it succinct by phrasing sentences so that they provide more than lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study, with the subsequent elements in any summary. Try to maintain the initial two items to no more than one ruling each.

- Reason of the study - theory, overall issue, purpose
- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
- As a outline of job done, it is always written in past tense
- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
- Center on shortening results - bound background information to a verdict or two, if completely necessary
- What you account in an conceptual must be regular with what you reported in the manuscript
- Exact spelling, clearness of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else

Introduction:

The **Introduction** should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
- Sort out your thoughts; manufacture one key point with every section. If you make the four points listed above, you will need a least of four paragraphs.

- Present surroundings information only as desirable in order hold up a situation. The reviewer does not desire to read the whole thing you know about a topic.
- Shape the theory/purpose specifically - do not take a broad view.
- As always, give awareness to spelling, simplicity and correctness of sentences and phrases.

Procedures (Methods and Materials):

This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt for the least amount of information that would permit another capable scientist to spare your outcome but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section. When a technique is used that has been well described in another object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text all particular resources and broad procedures, so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step by step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

What to keep away from

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.

Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
- If you desire, you may place your figures and tables properly within the text of your results part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

Discussion:

The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a argument should be. Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly described. Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved with prospect, and let it drop at that.

- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

- When you refer to information, differentiate data generated by your own studies from available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

Please carefully note down following rules and regulation before submitting your Research Paper to Global Journals Inc. (US):

Segment Draft and Final Research Paper: You have to strictly follow the template of research paper. If it is not done your paper may get rejected.

- The **major constraint** is that you must independently make all content, tables, graphs, and facts that are offered in the paper. You must write each part of the paper wholly on your own. The Peer-reviewers need to identify your own perceptive of the concepts in your own terms. NEVER extract straight from any foundation, and never rephrase someone else's analysis.

- Do not give permission to anyone else to "PROOFREAD" your manuscript.

- Methods to avoid Plagiarism is applied by us on every paper, if found guilty, you will be blacklisted by all of our collaborated research groups, your institution will be informed for this and strict legal actions will be taken immediately.)
- To guard yourself and others from possible illegal use please do not permit anyone right to use to your paper and files.

Criterion for Grading a Research Paper (Compilation) by Global Journals Inc. (US)

Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals Inc. (US).

Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

INDEX

save our planet

Global Journal of Computer Science and Technology

Visit us on the Web at www.GlobalJournals.org | www.ComputerResearch.org
or email us at helpdesk@globaljournals.org

ISSN 9754350