



XXV International Federation of Surveyors Congress,
Kuala Lumpur, Malaysia, 16 – 21 June 2014

*Welcome 2
MALAYSIA*

**HARNNESSING THE USE OF ICT IN SURVEYING
AND GEO-INFORMATICS TRAINING IN
TERTIARY INSTITUTIONS IN SOUTH EASTERN
STATES OF NIGERIA**

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PRESENTATION OUTLINE

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- INTRODUCTION
- BASIC DEFINITIONS OF CONCEPTS
- ICTs IN DEVELOPMENT
- ICT EDUCATION AND IMPORTANCE
- BENEFITS OF ICT IN SURVEYING AND GEOINFORMATICS TRAINING
- APPLICATION AREAS IN SURVEYING AND GEOINFORMATICS
- AIM & OBJECTIVES OF THIS WORK
- METHODOLOGY
- A STUDY OF THE SELECTED INSTITUTIONS
- APPRAISAL

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INTRODUCTION CONTD

- **RECOMMENDATION AND CONCLUSION**
- **REFERENCES**
- **BIBLIOGRAPHICAL NOTES**
- **ACKNOWLEDGEMENT**

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INTRODUCTION

- The world is moving at an unimaginable speed in the area of information use and dissemination.
- The most vibrant sector of the national economy is the information technology industry as well as the educational sector (UNESCO, 2002).
- Generally, ICT holds out the opportunity to revolutionize teaching methods, expand access to quality education and improve the management of education system (World Bank, 2002).



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INTRODUCTION CONTD.

- ICT represents an embedded platform which comprises of facilities or technologies aimed at information processing and electronic communication (Ndukwe 2008).
- In real terms, ICT supports any type of training either through the teaching or learning medium due to its ease of use, dynamic, interactive, flexible and engaging model. It sheds more light in terms of real opportunity to and individualized institution.



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INTRODUCTION CONTD

- “Professional Competence Model as enunciated by Stig Enemark (Enemark, 2006) is in tandem with ICT compliance.
- The idea of “learning for life” is replaced by the concept of lifelong learning. E-Learning is essential in this regard (Enemark, 2006).

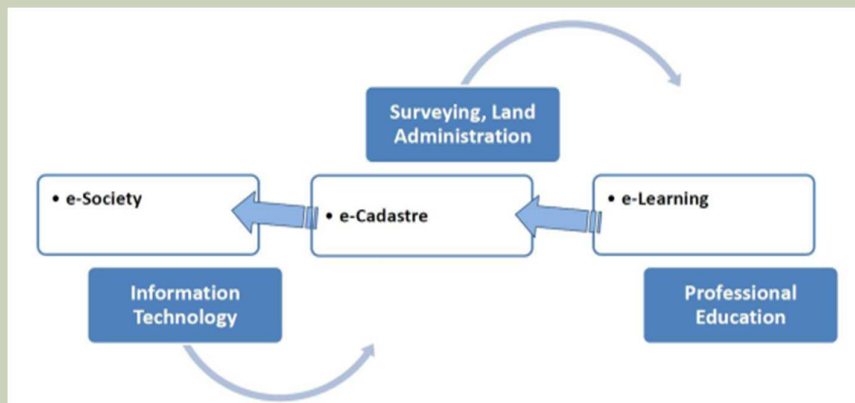


Fig 1 Professional Competence Model

(Adapted from Markus (2011))

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WHAT IS GEOINFORMATICS ?

- Geoinformatics can be defined as a body of knowledge that deals with the acquisition, processing, manipulation, presentation and dissemination of spatial data using information technology.
- It combines geospatial analysis and modeling, development of geospatial databases, information systems design, human-computer interaction and both wired and wireless networking technologies.
- It uses geocomputation and geovisualization for analyzing geoinformation

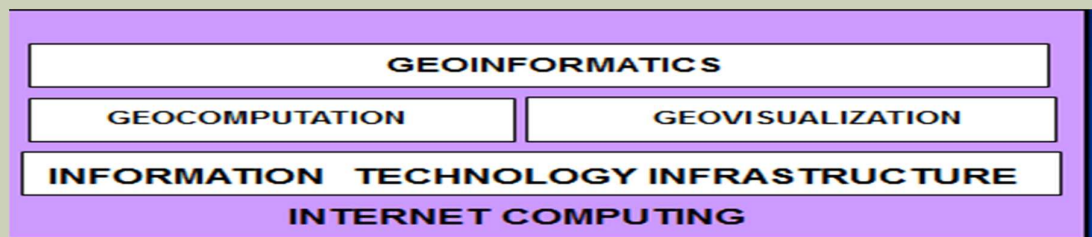
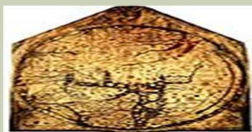
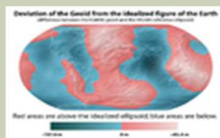


Fig 2 Geoinformatics & Internet computing domain source: UNEC, 2013.

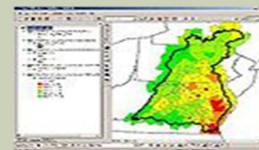
AREAS OF APPLICATION OF ICT IN SURVEYING & GEOINFORMATICS



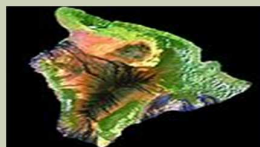
Cartography



Geodesy



GIS



Remote Sensing



Web Mapping



GNSS



Photogrammetry

DEFINITION CONTD.

- Training for general ICT skills involve training in computer appreciation, office application Programmes, sending email, use of internet to mention but a few.
- While training for specific ICT skills involves how to use computers in subject based teaching, computer assisted instruction (CAI) packages and so on

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AREAS OF APPLICATION OF GEOINFORMATICS

- ❖ **Urban planning and land use management**
- ❖ **Environmental modeling and analysis**
- ❖ **Transport network planning and management**
- ❖ **Agriculture, meteorology and climate change**
- ❖ **Oceanography and coupled ocean and atmosphere modeling**
- ❖ **Architecture and archeological reconstruction**
- ❖ **In-car navigation systems**

SOURCE: UNEC 2013.

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USE TOOLS FOR ICT

- ***Ubiquitous Computing Network:*** Computers and Sensors, which exist everywhere and are communicating with each other and support our life
- ***Broad bandwidth***
- ***A gateway to the global technology village***
- ***Access to Geoservices: Geodata, geoprocessing tool, open source software***
- ❖ **Geodata Services**
- ❖ **Geoprocessing Services**
- ❖ ***open source Tools***

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ICT TOOLS

- **Some of Geoservice examples available from the GeoServNet :**
- **· Geospatial Display Services (GeoEye):** This service permits Viewing and simple querying of data . (GeoEye) supports most display functions, such as zoom, pan, select, identify, layer control, color style control, etc.
- **· Geodata Access Services:** This system allows the user to download data from servers or upload data from the local site. It also allows the users to overlay data layers coming from different servers or local machines. This is a very useful data access mode since in reality, data could come from anywhere in a network

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ICT TOOLS

- **Map Annotation and Symbolization Services:** In cartographic mapping, map annotation and symbolization are of particular value for many on-line service applications.
- **Terrain Analysis Services:** Permit terrain data download ,analysis and
- **3D Visualization:** Provides 3 -D reconstruction and visualization functions .
- ***Distributed /Online collaboration in:***
 - ❖ Geodata production
 - ❖ Geodata Update
 - ❖ Geoinformatics research

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ICT TOOLS

- Some examples of online collaboration tools for geodata production.
 - ❖ Google Mapmaker
 - ❖ Google 3D Warehouse
 - ***Access to advanced spatial applications: 1***
 - Some examples :
 - ❖ Google Maps
 - ❖ Google Earth
 - ❖ MSN virtual Earth
 - ❖ Multimap
 - ❖ ***Read/write access to spatial databases interactively anywhere in the world .***
- create s many interesting opportunities, such as the ability to use external databases of various types.

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ICT TOOLS

- **Some examples of external databases.**
 - Oceanographic database
 - Weather database
 - Property database
 - Demographic database
 - Road database
 - Shuttle Radar Topographic Mission (SRTM)

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BENEFITS OF ICT BASED EDUCATION

■ **ICT in Schools**

- ❖ ICT is a crucial resource in education.
- ❖ practical ICT skills transferable into the work place.
- ❖ Teachers upload course documents so that students misses a lesson, they can download information and do the work in their own time.
- ❖ Encourages student-driven lessons, where students take responsibility for their learning.
- ❖ learning tools would be available to students .
- ❖ Allow schools to be linked and to share resources through broad band internet access.

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ICTS IN DEVELOPMENT

- Ubogu & Egbezor (2007) described Information and communication Technology (ICT) as advances in technologies that provide a rich global resource and collaborative environment for dissemination of ICT literacy material, interactive discussions, research information, and international exchange of ideas, which are critical for advancing meaningful educational initiatives, training a high skilled labor force, and understanding issues related to economic development

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BENEFITS CONTD.

- Policymakers emphasis that ICT in education has a multiplier effect National Development by:
 - ❖ Enhancing learning and providing students with new sets of skills
 - ❖ Reaching students with poor or access (in rural areas)
 - ❖ Facilitating and improving the training of teachers
 - ❖ Minimizing cost associated with delivery of traditional instruction; and
 - ❖ Improving the administration of schools in order to enhance the quality and efficiency of service delivery.

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BENEFITS CONTD

- Ojedoku and Owolabi (2003) cited in Nwezeh (2014) opined that teachers /lecturers in developing and emerging economies like Nigeria need to change their teaching styles and acquire internet skills and hence ICT skill should transform the class room in the next two decades.
- Relevance of university education in National development can be seen in the following areas:-
 - ❖ Enhancing societal development by training meaningful youths(citadel of learning)
 - ❖ Restoration of the dignity of man(UNN motto and mission statement)
 - ❖ Enhancing and improving the professional competences of the individual
 - ❖ Removal of major sources of poverty and tyranny
 - ❖ Development of proper indices for knowledge use and application

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Evolution of Education Technology

Chalk-and-board has long ruled the classrooms
will not be eliminated
Less emphasis



Interactive Digital Content:

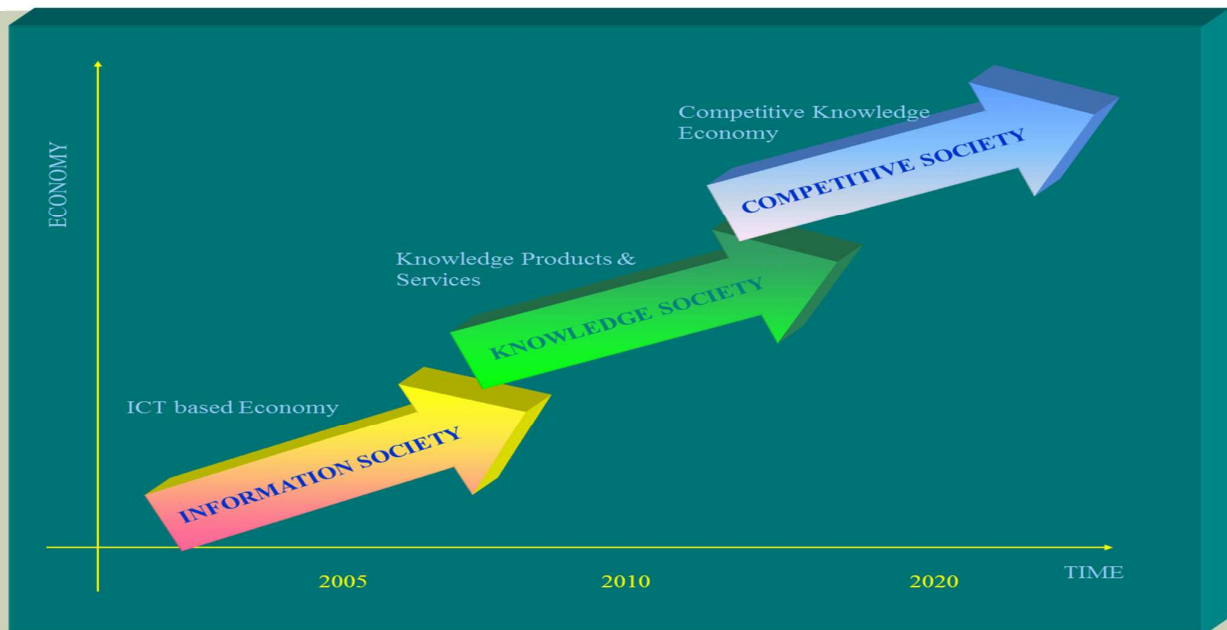
- more emphasis
- on demand learning
- interactive



Source: RTM TECHNOLOGIES

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ICT EDUCATION VISION



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DIMENSIONS TO ICT IN EDUCATION

- **ICT/Digital Literacy:**
- **ICT infrastructure and support Applied Technologies**
- **Specialized Business and Industry Uses of ICT**
- **Bioscience industries**
- **Financial institutions**
- **Manufacturing industries**
- **Property management**
- **Telecommunications**
- **Electricity utilities**
- **In teaching and learning (e-learning)**

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AIM & OBJECTIVE OF THIS STUDY

AIM

- Owing to the importance of ICT in the field of Surveying and Geoinformatics, there is need to develop a competent workforce through adequate education and training that understands not only relevant technologies, but also specialized business and industry environment and operations, to meet these specialized needs in South Eastern Nigeria.

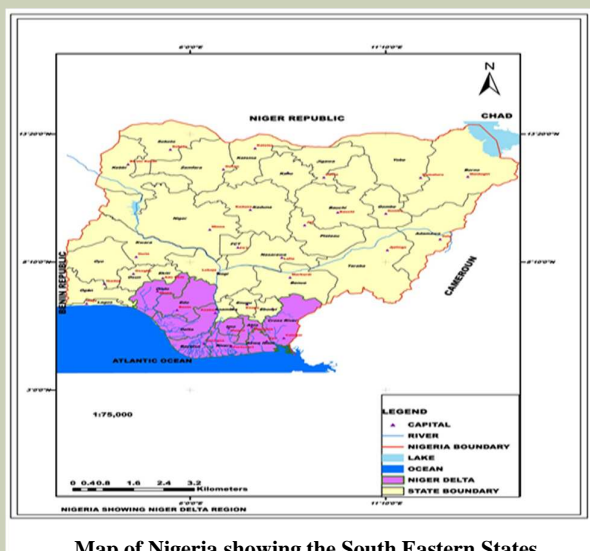
OBJECTIVES

- The above aim will be realized by harnessing the potentials of ICT in Surveying and Geoinformatics training and practice.
- Ensuring that responsible digital citizenship is established amongst the young ones.

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METHODOLOGY

STUDY AREA



Map of Nigeria showing the South Eastern States
(Source: Chigbu et al; 2014)

- The project areas was South Eastern Nigeria(Abia, Anambra Ebony, Enugu and Imo States), that is a consideration of the tertiary Institutions/Universities in the Geo-political zone of Nigeria offering Surveying and Geoinformatics.

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FACT SHEETS ABOUT NIGERIA AND SOUTH-EASTERN STATES

NIGERIA

- CAPITAL-ABUJA
- MAJOR TRIBES:
HAUSA,IGBO,YORUBA.
- AREA: 923,768SQKM.
- 36 STATES & 1 Fed. Capital Territory.
- Six states population of over 1million:
- Population:
- 2013 Estimate 174507.537
- 2006 census:140431.790.
- Most populous country in Africa(GIANT OF AFRICA)

SOUTH EASTERN STATES

- ABIA
- ANAMBRA
- EBONY
- ENUGU
- IMO

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DATA NEEDS

- Relevant data was obtained by oral interview and questionnaires administered on students and lectures in various tertiary institutions in the five Eastern states.
- One hundred and ten questionnaires(110) were given out while eighty-two persons responded, which is approximately seventy-five percent .
- Fifty-two(52) were students,
- Twenty lectures(20) and the rest others interests in the field of study.
- The information from respondents were analyzed giving rise to the following:

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TERTIARY INSTITUTIONS IN THE LOCALITY

INST. TYPE	NAME/Year Established	LOCATION	PRGMS./GI	MODE	ACCRED.	OWNSHP
University	Abia State University (1981)	Uturu	No	NA	NA	State
	Ebony State University (1996)	Abakalika	NO	NA	NA	State
	Federal University Ebony (2011)	Abakalika	None	NA	NA	Federal
	Enugu State University (1996)	Enugu	Yes	BSc,	Yes	State
	Nnamdi Azikiwe University	Awka	Yes	BSc,PGD,MSc,PhD.	YES	Federal
	Anambra State University (2000)	Igbariam	None	NA	NA	State
	Federal University of Tech. Owerri (1980)	Nekede Owerri	Yes	BSc	NO	Federal
	Imo State University (1981)	Owerri	Yes	BSc	Yes	State
	Michael Okpara Fed.Univ. of Agric.(1993)	Umudike	NO	NA	NA	Federal
	University of Nigeria (1960)	Nsukka/ Enugu	Yes	BSc,PGD, MSc, PhD.	Yes	Federal

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TERTIARY INSTITUTIONS CONTD.

	Madonna University (1999)	Okija	NA	NA	NA	Private
POLYTECHNICS	Abia State Polytechnic (1992)	Aba	Yes	ND, HND.	Yes	State
	Federal Polytechnic Nekede	Nekede Owerri	Yes	ND, HND.	Yes	Federal
	Imo State Polytechnic	Iheagwa	NONE	NA	NA	State
	Institute of Magt. & Tech	Enugu	NONE	NA	NA	Federal
	Ebony State Polytechnic (1996)	Abakalika	NONE	NA	NA	State
	Federal Dept. Agric and Water Resources	Owerri	Yes	ND HND	Yes	Federal
	Fed.Poly. OKO (1979)	Oko	Yes	ND HND	Yes	Federal

Source: (Chigbu et al; 2014)

LEVEL OF ICT COMPLIANCE IN THE TERTIARY INSTITUTIONS (FED. UNIVERSITIES) IN S/E NIGERIA

UNIV/ITEMS	FUTO	NAU	UNN	MAU	FED EBONY
Lecturers	9	11	12	NA	NA
Average student Intake	33	50	40	NA	NA
Graduate intake	NA	40	35	NA	NA
Virtual Library	NA	1	1	NA	NA
Equipment/ Hardware	2Total Stations, DGPS, DLevels, others.>30 computers	>5 Total Stations,Scanners,DGPS, DLevels, others,1 GIS LAB, STUDIOS,1 R/S LAB >40 computers	>25 Total Stations, Scanners, DGPS DLevels, >60 computers.	NA	NA
Funding	Federal	Federal	Federal	-	Federal
Affiliation	UNKNOWN	FIG ACADEMIC MEMBER,ISPRS,etc.	FIG	-	-
Source of Power	PHCN Gen. Set	PHCN Gen. Set	PHCN Gen. Set	PHCN Gen. Set	PHCN Gen. Set

Source: (Chigbu et al; 2014)

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LEVEL OF ICT COMPLIANCE IN THE TERTIARY INSTITUTIONS (STATE UNITIES) IN S/E NIGERIA

UNIV/ITEMS	ABSU	ESUTH	EBONY	ANANBRA	IMSU
Lecturers	NA	7	NA	NA	8
Average student Intake	NA	45	NA	NA	28
Graduate intake	NA	NA	NA	NA	NA
Virtual Library	NA	NONE	NONE	NA	NA
Equipment/ Hardware	NA	>2Total Stations, .DGPS, DLevels, others,1 GIS LAB, STUDIOS,1 R/S LAB	NA	NA	NA
Software Usage	NA	ArcGIS, Erdas, AutoCad, ILWIS,ANNOVA, QGIS,MATHLAB, etc.	ArcGIS, Erdas, AutoCad, ILWIS,SPRING, QGIS,MATHLAB, etc.	NA	NA
Funding	STATE,TET FUND	STATE	STATE	STATE	STATE
Affiliation	UNKNOWN	UNKNOWN.	UNKNOWN	-	-
Source of Power	PHCN Gen. Set	PHCN Gen. Set	PHCN Gen. Set	PHCN Gen. Set	PHCN Gen. Set

Source: (Chigbu et al; 2014)

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LEVEL OF ICT COMPLIANCE IN THE TERTIARY INSTITUTIONS (FED. POLYTECHNICS) IN S/E NIGERIA

UNIV/ITEMS	OKO(ANAMRA)	FED EBONY	IMT(ENUGU)	NEKEDE(IMO)	FED ABIA
Lecturers	10	NA	NA	7	NONE
Average student Intake	30	5NA	NA	27	NA
Graduate intake	NA	NA	NA	NA	NA
Virtual Library	-	-	-	1	NA
Equipment/ Hardware	Total Stations, DGPS, DLevels, others.	NA	NA	Total Stations, DGPS, DLevels, others.	NA
Software Usage	ArcGIS, Erdas, AutoCad, ILWIS	ArcGIS, Erdas, AutoCad, ILWIS, etc.	NA	NA	NA
Funding	Federal	Federal	Federal	Federal	NA
Affiliation	unknown	Unknown.	Unknown.	Unknown.	NA
Source of Power	PHCN Gen. Set	PHCN Gen. Set	PHCN Gen. Set	PHCN Gen. Set	NA

source: Chigbu et al,2014

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LEVEL OF ICT COMPLIANCE IN THE TERTIARY INSTITUTIONS (STATE POLYTECHNICS) IN S/E NIGERIA

UNIV/ITEMS	ABIA POLY	EBONY	ENUGU	ANAMRA	IMO
Lecturers	13	7	NA	NA	NA
Average student Intake	20	50	NA	NA	NA
Studio/Labs	3GIS,1RS	NA	NA	NA	NA
Virtual Library	1	1	NA	NA	NA
Equipment/ Hardware	4Total Stations, 2DGPS, 4DLevels, Ao Plotter &Scanner, >100 Computers.	unknown	NA	NA	NA
Software Usage	ArcGIS, Erdas, AutoCad, ILWIS,QGIS.eCognition,Spri ng, Wolfpack,etc.	NA	NA	NA	NA
Funding	State,TETFUND	State	State	-	State
Affiliation	FIG ACADEMIC MEMBER,ISPRS,etc	NA	NA	NA	NA
Source of Power	PHCN Gen. Set	PHCN Gen. Set	PHCN Gen. Set	PHCN Gen. Set	PHCN Gen. Set

Source: Chigbu et al; 2014

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DATA ANALYSIS

- Based on the above findings and information the following can be deduced:
 - The number of Lecturers in most of the are not very commendable.
 - It is the human capacity that will be the driving force in this campaign.
 - Again, the average student intake(which is less than 40 per session per school) is grossly inadequate, meaning that, the profession is not admitting the required number of students and hence, the succession plan for the profession in the for the future is very poor. This is a very bad signal

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DATA ANALYSIS CONTD.

- The facilities for good research work are also not readily available as funding too is poor.
- The research also went further to reveal that the extent of lecturers' utilization of the ICT facilities is very low.
- This is sequel to lack of electricity power supply, lack of basic computer operational skills etc.
- Incessant power failure is also serious impediment to ICT implementation.
- The libraries in the tertiary institutions in south eastern Nigeria showed that they are grossly under funded with respect to adopting ICT development.

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RECOMMENDATION AND CONCLUSION

- Recommendation
- Conscious planning of ICT usage in our schools and tertiary institutions.
- Adequate budgeting for ICT development in our schools advocated.
- ICT utilization in Surveying and Geoinformatics discipline must be encouraged to develop good professional literate persons.

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RECOMMENDATION CONTDS.

- A strategy for Collaborations amongst tertiary institutions running Surveying and Geoinformatics is also recommended.
- This can be on national, regional and International basis.
- FIG, WORLD BANK, INTERNATIONAL SERVICE PROVIDERS need to encourage affiliated institution in the Sub-Saharan especially those that have constantly fulfilled their financial obligations to FIG (ACADEMIC MEMBERS).
- .
- Such Institutions and Departments can be encouraged through donations such as text books, survey equipment, sponsorships and training to build capacity



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REMEMBER

- Rosalie O’Neale, stated that” as technology continues to evolve, and children and young people increasingly weave its use into the fabric of their daily lives, it becomes ever more important that this use of technology is underpinned by positive digital citizenship behaviors and attitudes. This guarantees that children will be able to realize the great potential of the internet and their own potential as well”



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CONCLUSION

- This paper has attempted to review the ICT application scenario with respect to Surveying and Geo-informatics training in tertiary institutions in South-Eastern Nigeria.
- It is obvious that contemporary Surveying and Geoinformatics training and practice go on hand -in- hand with ICT compliance.
- With the high rate of advancement in the development of sophisticated hardware and software in GIS, Remote Sensing, Satellite and Locational based studies, a lot need to be done to ensure the relevance of this discipline and profession is sustained even in the next century.
- ICT competency standards for teachers must be based on the three identified approaches: technological, knowledge deepening and knowledge creation.

WE CAN



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BIBLIOGRAPHICAL NOTES

■ BIBLIOGRAPHICAL NOTES:

■ Chigbu Njike CHIGBU NJIKE is the head of Surveying and Geoinformatics Dept. of Abia State Polytechnic, Aba in Nigeria. He has a Bachelor's and Master's Degree in Surveying and Geoinformatics from University of Nigeria and Nnamdi Azikiwe University, Awka, all in Nigeria, respectively. He has also completed his doctoral Degree course work in Surveying and Geoinformatics. His research interests are in areas of GNSS applications, Remote Sensing Image processing, application of Geo-spatial Science in Environmental Management and Planning. He is an active member of FIG Commission 2 & 3 and African Task Force (ATF). He is also an active Member of Nigerian Institution of Surveyors (NIS). Married to Mrs. Jennifer Eziaku Chigbu and they are blessed with three kids (Clinton, Chelsea and Campbell).

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