Chapter 1  Introduction

1.1 Introducing to Research

It is of view that there are two major components of activity in computer science, one oriented to system synthesis, exploration and innovation, and the other oriented to analysis, search for fundamental principles and formulation of theories. The mix and continuous interaction between these two components is essential for a vigorous rate of progress in the field of computer science. This study is geared towards the analytical (Formulation of theory) work in the field of computer science. This field promises to provide conceptual guideline for more efficient and more powerful designs and uses of computers.

Research and studies highlighting mostly software engineering domain and practice indicates lack of a value oriented perspective that relates to affective domain to enhance effective teaching and learning. Software design decision should map with business values concern as it relate to commercial software development context. Adopting a value oriented pedagogy provide strict methodology for effective products remarkable to various categories of people considering their utility function. The utility function or affective propositions constitute to determine relevant measure as it regard a given scenarios. The research work focus on how the development of a model using affective oriented pedagogy will enhances teaching and learning in four selected tertiary institutions in the southern region of Nigeria.

Noted worthwhile, is that a lot of recent research on Computer Science in the domain of design and development are based in a value neutral setting. This implies that use case, object and defect are regarded as the same rate of important. The bottom line is that software design and development is based mostly on turning software requirements into verified code or design. By implication development decision plays little influences on the variables such as system's cost, schedule and value, than the approach (value neutral) was appreciated and reasonably applicable. As the society developed and increasingly in due course, the design of software is rapidly having major influence on majority of system's cost and schedule/value. This value neutral software design approach can seriously degrade project outcome.
There is no doubt that there is abundant evident that Information and Communication Technology (ICT) is viewed as the deriving tool to enhance nation building and instrument in educational development. This is a clear view from the (Nigeria National Information Technology Policy) as its vision statement emphases that;

“To make Nigeria an IT capable country in Africa and a key player in the information society…using IT as the engine for sustainable development and global competitiveness”.

The mission statement expresses that;

“To Use IT for Education, Creation of Wealth, Poverty Eradication, Job Creation and Global Competitiveness”.

On this premises;

"the general objective of the Government is to integrate IT or ICT into the mainstream of education and training and restructure the education system at all levels to respond effectively to the challenges and imagined impact of the information age and in particular, the allocation of a special IT development fund to education at all levels” (National Information Technology Policy, 2000).

Notably, Nigeria like many developing counties is still initializing fully the levels of integrating of ICT process of the teaching-learning process. Many circumstances have led to the setback mostly in the higher institution of learning in Nigeria. ICT has been noted as an electronic media of capturing, processing, storing, with the communication of information .The implementation of ICT in teaching and learning cannot be overemphasized, it gives opportunities for effective teaching and learning by both teachers and students to advance learning capabilities.

There are indications that ICT has been utilized and implemented in schools across Africa. However, there are tensions or contradictions that is hindering the
implementation from advancing in enhancing effective teaching and learning process mostly in educational institutions of higher learning. From the teaching viewpoint, necessary questions pertinent to the relationships teachers develop with the use of ICT for instructional purposes.

- What are teachers’ attitudes toward ICT implementation?
- How do teachers utilize ICTs in education?
- What are the perceived value of the educational use of ICT?

The benchmark on both teacher and learner regarding teaching and learning perspective with attitude and motivation generate affect concerning ICT and virtual learning conditions. There is a stirring and urgent call for affective teaching and learning to affective computing. The fundamental of effective teaching and learning are derived from human Psychology and modern Psychology as a discipline in studying human behavior focuses on three folds; the cognitive, the co native and the affective. Most often the affective and the cognitive in recent terms has been used interchangeably. However, the affective is categorized in three principal dimensions;

- Valence
- Arousal
- Motivational Intensity

The subjected positive-to-negative evaluation of an experienced state to activation of sympathy and to the impulsion to act affects what we like and dislike. Reacting to the statement that views "Affect" as an intuitive reaction to stimulation occurring prior to the typical cognitive processes that is considered necessary for the construction of a more complex emotion. Affective reactions can occur without extensive perceptual and cognitive encoding and can be made quicker and with higher confidence comparative cognitive judgments (Zajone 1980).

According to Bloom's Taxonomy, skills that are in the affective domain describe how people react to emotions as well as their ability to feel stimuli: Affective objectives normally target the person's awareness and growth in their attitudes, emotion and feelings. By implication greater activities in human endeavor are ruled by emotions, emotions are very important in human intelligence, perception,
memory, creativity, teaching, learning and so on. Among these affective which are human emotions has been noted to govern and rule our day to day activities. However, the misconception of "being emotional" or "acting emotional" are not valid proof and excuses for ignoring the study of emotions and its application to teaching, learning and computers (systems) applications. Time is due and this is the right time to make our systems affective oriented, examine how emotions can be incorporated into models of intelligence, and specifically into computers and their interactions with humans (Bloom et al 1956).

Funding for research has reveals development of intelligence computers focusing on problem solving, reasoning, learning, perception and other cognitive tasks basically essential to intelligence. Without over emphasis, emotions influences all the shortlisted concepts above and in humans. This new thought about the role of emotion in humans pinpoint a rethink to the role of emotion in computing and by extension inculcating this principle first to the teaching and learning environment since it governors and influences our passionate activities. **It is clear that computers should be adapting to people rather than people adapting to computers.**

ICT is used to operate, store, manipulate, and retrieve information which facilitate effective teaching and learning within and outside the traditional learning settings. It promote individual learning, activate, motivate, and encourage distance learning. Self-responsibility for studying outside schools hours, planning and preparing lessons and design materials such as delivering the contents and facilitating resource sharing, expertise and advising is paramount for instructors. ICT has the capability of engaging in instructional activities to improve and increase learning as well as helping them to solve complex problems that enhances their cognitive skills. Emphasis has been basically focused on using ICT to promote cognitive teaching-learning abilities. On this backdrop this research wishes to examine the effect of affect and a comprehensive model in using ICT for teaching and learning environment.

To achieve the objective, three theoretical frame works is adopted for better understanding;
1. Technology Acceptance Model (TAM).
3. The Unified Theory Of Acceptance and Use of Technology Model (UTAUT).

These models will help explain the impact of affective domain in teaching-learning environment with the available ICT facilities.

1.2 Statement of the Problem/Research Gap

It can no longer be said that no nation can grow above its educational attainment, education is power, effective teaching is the core and learning is the solution. Education is drifting away from the traditional classroom to a global perception and it's dynamic in nature. What types of ICT are used in education? What stops and permits the adoption and use of ICT in higher institutions? How do lecturers/students perceive the use of ICT systems and services? The ease of use of ICT systems to them? The cost effectiveness perceived by the teachers/students? The advantages of ICT availability and impact by lecturers/students and the efficiency in teaching and learning cannot be excessively prioritized. Failure to take on ICT in recent times compared to the conventional method of teaching has led to fairly seemly unproductive education.

- TAM models and research focuses on information technology concepts limiting human factors.
- Many claimed relevant variables for predictive model of technology acceptance never play vital role in individual user level.
- Perceive ease and usefulness shows predictive of acceptance but not diagnostic.
- The inhibiting factors of acceptance of technology such as source of power, organizational approval and acceptance, privacy and security issues have been minimally investigated and impose a course of concern.
- Majority of research on technologies acceptance has focused basically on intentional acceptance rather than attitudinal acceptance which is positive evaluation of human beliefs about given technology or something.
• Studies indicates that perceived usefulness and ease of use are more important than perceived affect while others suggest the contrary.

1.3 Background to the Subject Matter

Teaching and learning is one of the oldest occupations and will always remain as one. But impacting knowledge from one generation to the other has been a crucial issue. How, when and where is a factor in consideration to effectively impacting knowledge and these questions remains constant. In the 21st century knowledge has exploded, the vast knowledge and the appropriate means to acquire such knowledge is vital to enhance the advancement of our increasing complex society and the technological advancement. Some institutions of learning in Africa have invested remarkably in ICT to enhancing teaching and learning (knowledge) but the graph has shown a down slope trend indicating depreciation in learning out. With the invention of the internet, ICT facilities have exploded with vast knowledge being access anywhere in the world. Why is the standard of education considered to dipping as noted by researchers?

On this backdrop, this work seeks to identify those silent issues which when considered in the teaching and learning environment with the availability ICT facilities will enhance its effectiveness. More specifically to focus on the affective behavior and a generalized model that will facilitate the use of ICT facilities to enhance education.

1.4 History and Overview of Selected Higher Institutions in the Southern Nigeria

➢ FCE(T) Omoku, Rivers State Nigeria

The Federal College of Education (Technical) Omoku Rivers State of Nigeria was founded by Act No. 4 of 1986 of the Federal Government of Nigeria, this Act was later amended to Act No. 6 of 1993.
The college was established with the purpose as follows;
(a) With meeting up challenges with regards production of local manpower in all
sphere of the academia for the nations self-relevance in secondary and technical colleges.
(b) The production of home made facilities for students to aid students' interest mostly in vocational teacher education and
(c) Making the college more run seminal centers in ideas development to enhance teaching of core subjects with regard to management of technological institutions.
The courses that are offered leads the award of NCE in Technical, Science, Vocational and Business Education on full and part-time basis. Recently the college has been upgraded in awarding of first degree certificate in selected discipline.
Among her list of offers a part-time skill attainment scheme for all categories of youths of the oil rich host communities to acquire saleable skills for self independence.
The college kick started at its temporary site by April 1989. And the college moved to its permanent site in 1997 and construction work of the said site in 1998. Some schools in the college has moved to the new site it is believed that gradually other schools will be moved to the permanent site as well as students to their hostels and other facilities as when due. (www.fcetomoku.edu.ng/home/about-us/history.php 7th November 2015).

Figure 1.3: FCE(T) Omoku
(www.fcetomoku.ng/new/index.php 08/06/16)

➢ Rivers State University of Science and Technology
The university was established in October, 1980 from what was known as the Rivers State College of Science and Technology. The said college was founded in 1972.

Figure 1.4: Map of Rivers State showing Port Harcourt City where universities are located: http://www.nou.org.ng/list-of-the-36-states-of-nigeria-and-their-capitals/

The university is sited at Nkpolu-Oroworukwo in Port Harcourt, the capital of Rivers State, Nigeria.
This marks the first Technological University in the country owned by the state government in the Niger Delta region of Nigeria. The university goes by the motto "Excellence and Creativity" and ranked as the 12th among 80 other Universities in Nigeria. The faculties of Agriculture, Engineering, Environmental Sciences, Law, Management Sciences, Science and Technical and Science Education; and a Postgraduate School are among the list of faculties in the University. There is a solid plan by the government to designate a more befitting site called the Greater Port Harcourt City to decongest the already overcrowded Port Harcourt city. The city will host the new of the present university. It is clear by the Government's mission statement on this, "The new University will be a leading Centre of academic excellence in Africa and beyond; a world class University with world-class facilities, which will be manned by a team of committed administrators, academics and researcher of high caliber, who share the founding vision of the new University to be ranked among the best 1,000 Universities in the world by 2020. It is hoped that by the time this objective is realized, there is no doubt that RSUST will be equal to none in Nigeria and indeed in Africa (www.ust.edu.ng/index.php/about/who-we-are/about-rust).

- **History of Ignatius Ajuru University of Education (IAUE), Port Harcourt**

At the end of the civil Nigeria civil war in 1970, there was an acute shortage of trained teacher to man the post-primary education. In this like, a committee was appointed by the Rivers State Ministry of Education to examine the problem and to make adequate recommendations on the establishment of an Advanced Teacher Training College. The report submitted by the committee stressed the need to invest much energy in the right directions to ensure that the schools in Rivers State did not face the danger of either collapsing or producing students who would be worth nothing on their graduation.
In January 1972, the college was relocated to another temporary site, however, 1974 the promulgation of the Nursery and miscellaneous education institution edit No. 10 of 15th November, 1974. Henceforth the college was directly controlled by the direct control of the Ministry of Education. The chronology of the institution it has improved year after year into a full university with various academic programs are offered ranging from Nigeria certificate in Education (NCE) programme and various degree programmes.

The decision to convert Rivers State college of education into a university was taken in 2009 by the Rivers State Government in furtherance of its desire to provide opportunities for high quality education for citizens of the state. Given the reasonably favorable financial situation of Rivers State, the Government considered it expedient to establish the second state Government owned university. Ignatius Ajuru university of Education was established by the University of Education law No. 8 of 2009 of the Rivers State Government passed by the Rivers State House of Assembly on 15th October 2009.

**History of University of Port Harcourt (Uniport)**

The University of Port Harcourt is a university in the Nigerian city of Port Harcourt. It was established in 1975 as University College, Port Harcourt, and was given university status in 1977, the institution offers courses in various disciplines and degrees. Recently, the university of Port Harcourt has been ranked the sixth in Africa and the first in Nigeria by Times Higher Education (THE) as reported by the university web site. Times Higher Education (THE) ranking is a United Kingdom based authoritative source for information about higher education. The university rankings provider has revealed the top 15 universities in the region, based solely on their scores for research influence. (en.wikipedia.org/wiki/university-of-Port-Harcourt).
1.5 Availability of ICT in the Institutions for Teaching and Learning

Viewing the ICT facilities mostly used for teaching and learning environment (Yusuf 2008) in (Oviawe et al., 2011) posits that ICT is an umbrella term that includes communication devices or application (radio, television, cellular phone, computer hard and software and networking, and satellite system) and services associated with them. ICT is seen as term used to denote a wide range of services, application and technologies using various types of equipment and software running over telecommunication networks. ICT can be defined as computer based tools and techniques for gathering and using information. It encompasses the hardware and software, the network and several other devices (video, audio, photographic camera, etc.) that can convert information, images, and sound into common digital form. It includes electronic information in processing technologies such as computer and internet, as well as fixed-line telecommunication networks. ICT is an eclectic application of computing, communication, telecommunication and satellite technology. More so, Communication technologies include all media employed in transmitting audio, video, data or multimedia such as cable satellite, fiber optics, wireless (radio, infra – red, Bluetooth, Wi-Fi). Network technologies on the other hand include: Personal Area Networks (PAN), Campus Area Network (CAN), intranets, extranets, Local Area Networks (LANs), Wide Area Networks (WANs) and the internet. Computer technologies include all removable media such as optical discs, disks, flash memories, video books, multimedia projectors, interactive electronic boards, and continuously emerging state-of-the art personal computers (PCs). Mobile technologies such as mobile phones, Personal Digital Assistants (PDAs), palmtops, etc. which have information as their material object are also used in e-learning.

Most of these ICT facilities has been used by both teachers and learners in various circumstances but to what extent has it been used in the formal learning environment. In studying students in FCE (T) Omoku using ICTs admit using the following ICT facilities in learning in the formal classroom, they are; computers,
website, Tablets, Handsets and Ipads, other available channels area campus ratio, video, audio tapes, interactive board etc, (Oruan 2014).

In acknowledge the following areas that ICT plays important role in teaching and learning he stated that generally, three objectives are distinguished for the use of ICT in education;

(i) **The use of ICT as objects of study;** refers to learning about ICT, which enables students to use ICT in their daily life.

(ii) **The use of ICT as aspect of discipline or profession;** refers to the development of ICT skills for professional or vocational purposes.

(iii) **The use of ICT as medium for teaching and learning;** focuses on the use of ICT for the enhancement of the teaching and learning process.

Irrespective of abound evidence of increased usage of information and communication technology (ICT) in educational programmes, notably the extent of evaluation on the impact of ICT on educational learning outcomes are sparse and often lack the approach necessary to guide policymakers towards sound, evidence-based practices. This evidence mostly in the developing counties, this work focuses on the challenges associated with developing, implementing and evaluating ICT solutions within educational settings, perceptions on the utility and future of ICT solutions and extant gaps in the usage of ICT solutions within developing countries (Guma et al 2013). The impacts of ICT on students and instructors is an innovative and affective research agenda addressing salient issues such as impact, availability and effectiveness on return on investment. The understanding facts is the determination of the impact that information and communication technologies (ITCs) in education has had on student learning in developing country contexts. The American Institutes for Research (AIR) International Development Division (2009) in a paper titled "A review analysis survey of the Research and Impact of ICT in the academia in Developing Country Contexts" shows that the impacts of ICTs on student learning outcome in developing countries comprise mostly of qualitative studies.
The study seek to tackle the hypotheses that state that many ICT-based reforms are approved with regard on intuition rather than research or science. Findings observed that a lot of existing research are representative of the impacts of interventions employing ICTs with students and adults are from advanced countries. Studies shows that the research conducted in developed countries have shown and proven that the relationship between ICTs and students upshot is a comparatively complex one. The stress that a clear cut consensus has not emerged regarding the direction or the degree of ICTs effects on students, because part to the design of program evaluations. It is clear that conclusive evidence on issues that intervene or moderate the links between ICTs and educational outcomes has not been clearly demonstrated.

Fuchs and Woessman bearing in mind the significance of availability and impact of ICTs and students achievement discover a depressing association between computer availability in US homes and attainment score for students, in the same vain other large-scale studies also revealed within the USA a more impressive relation between computer availability in homes with regard to their test scores (Blackmore et al 2005). In all it speak volumes that such contradictory results within the developed world countries shows that a more rigorous research in both advanced and developing countries need be conducted as yet more important questions on the important on ICTs on student learning outcomes remain yet to be fully unanswered.

Analysis and evaluations in the use of ICTs in developing countries focus on correlation, standard deviation and mean designs model to test whether variables have relationship among them. This pedagogy used question a more detailed review on looking into why and how ICTs may be used within the academia environment to boost learning outcomes, without consideration if their usage results to desired conclusion in future. This study adopts an affective variables to an ICTs existing model to enhance the over time long time effect on teaching and learning using ICTs for effectiveness. The study focuses on both qualitative and more rigorous experimental techniques (Kozma et al 2004; Light et al 2008; Linden et al 2008).
1.6 Impact of ICT on Teaching and Learning

Knowledge has exploded and we are in the information age, the old traditional method of instruction is becoming obsolete. New methods need to be adopted, (Yelland 2001), rightly pointed that the conventional educational system do not adapt and produced manpower capable and suitable for our fast growing industrial environment and the adequately suit in our today's society as the objective of why the system is opt to provide. The report solicit that no effective institution can survive the trend of the twenty-first century without adopting the innovative technologies is needed in our learning process mostly in the classroom and cannot claim to have prepare their students for the challenges. (Grimus 2000) support this argument by stating that by using ICT teaching skills the students are exposed and equipped to face opportunity developments based on proper understanding. Among the list of support provided by ICTs to facilitate and enhance effective teaching and learning through;

- The improvement of memory retention, amplify motivation and quickens understanding.
- Group learning resulting to collaborative learning, like playing, group problem solving activities, as well as articulated projects.
- ICTs develop rich networks of interconnections among peers and communicates between individuals.

Most school of thought has the view the pedagogy of learning can be dramatically improved by the power of technology, while others says that can “revolutionize” the education process, (Schank 2005). By this view ICT broaden professors and student capabilities and their optimistic resolute use in no measure can renovate teaching / learning roles and policy in the teaching and learning environment drastically.

ICT has been identified by many as catalyst for change in the various areas;

- The way work is done and the working specifications
- Change in handing and discrimination of information
- Change in instruction method and education approaches
- Change in technical research and obtaining information

Worthwhile instructors can use ICT to smooth the progress of learning, decisive thinking and group discussions. Noted that though technology–based instructions many not be effective in all instructional process but is facilitative as a result of providing significant examples and demonstrations. In summary technology in instruction is to give better understanding and value to students; this value should impact performance (Miller et al 2000:3). Believes holds that ICT uphold much promise for use in curriculum delivery, hence ICTs can effectively advance instruction abilities therefore rising performances.

(Guma Ali et al 2013) referencing (Castro, 2003) state that ICT has the power to help in the training of learners by developing all the necessary skills required for effective learning, evaluation and synthesizing skills. Accepting the facts portrayed one concept is clearly missing or under estimated the affect aspect of using ICT for teaching and learning. This work is of the strong believe that of all the above listed ICT facilitators may not be effective if the very ICT facilities itself does not attract interest, appreciation, affection and the appropriate mode for teaching and learning.

1.7 Challenges of using ICT in Teaching and Learning

It is quite amazing that some teachers still wish to maintain the old pedagogical approach of instruction in the formal education system. Listen to this; a retiring professor during his send forth has this comments, that he thanks the college administration for the provision of the latest state of the art technology for teaching and learning. However, after some manpower training on this technology he still entertain uncertainty and far on how to adequately apply it in the classroom environment. He commented that he thank God for retiring successful rather facing the new innovation to attract queries from the authority.
This pinpoints that the introduction of technology in education aggravates a array of feedbacks from teachers that express passion and skepticism to fear and indecision. Change we noticed is constant but to effect change is often a difficult task, the introduction at first of a new idea as well as the use of new technology in the same traditional lifestyle as the old technology often results to misconceptions. Old plan of instruction and pedagogical approaches should be rehabilitated and if necessary restructured or replaced, this will enhance the introduction of the new media. It is no longer a news that research indicate that ICT facilities mostly ICTs are used fewer often in the instruction than in other conventional organizations. A report presented by the above author on the proceedings of the 7th international conference on networked learning 2010 revealed the following as some of the factors challenging the use of ICTs in classroom (Charalambos 2010):

- The quantity of content and the rate of the curriculum to be enclosed and covered school calendar.
- The significant of time planning and implementation.
- Collaborative and situated professional development.

Among these factors the most important barrier was the curriculum implementation itself with regards to the available time to integrating ICT. Two factors considered in the implementation points to pressure of coverage of content and timeframe. More so, most school curriculum does not integrate ICT in their schemes. Noted critically is time itself is a factor been considered in the implementation ICT in the classroom, a study showed that 71.7% teachers comment that time is a main barrier in ICT preparation for instruction, (Charalambos et al, 2010). From this result it is clear that planning and focus for instruction that incorporate ICT is a time intense activity as viewed by instructors view point. This is a basic reason technologies are not often used in their classroom. Also the execution of ICT-based activities consumes much time as regard the traditional method.

A summary view of different barriers that is facing the use of ICT in classroom as noted by (Khalid 2009:235-245) in his paper cited (Ertmer 1999) point to a barriers
known as extrinsic as first-order, with access, time, support, resources and intrinsic barriers as second-order, while attitudes, beliefs, practices and resistance are the attributes. Categorized barriers states whether they relate to the individual (teacher-level barriers), these are insufficient of time, inadequate confidence, and opposition to change, or to the institution that is school-level barriers, (Khalid 2004).

The barriers has been further divided into various categories micro level and macro barriers, the later relates to teachers' attitude approach to ICT instruction handling. While macro level barrier relates to institution context, a third barrier includes macro level in view of system-level barriers and these speak of wider educational frame work. Another noticed barrier constitute the inherent factors due to institutions lack of adequate materials to no materials. An indication that most of these studies on ICT barriers for instruction focuses on the teacher, institution or system level (Khalid 2004).

1.8 The Objectives and Rationale of the Research

The intention of the research was to explore the accessibility and impact of ICT infrastructures using TAM model and intended hybrid vision on instruction ability in four selected universities in Nigeria. The specific goal of this research project is to develop a model that would enable understanding, at the individual user level and corporate level to enhance technology acceptance valid decision making process. The understanding would derive the development process of technologies appeal to consumers acceptance and provide direction for the preamble and propagation of information about such products. The process is viewed by the corporate world as a pipe line for effective technology development to ultimately subdue uncertainty in teams of considering of line of new technologies for product development programs.

1. To use an existing model Technology Acceptance Model (TAM) with the introduction of some new latent variables to verify it strength, develop a
new proposed model to enhance teaching and learning in four selected universities in southern Nigeria.

2. Analysis of TAM model with an existing algorithms (SVM, Decision Tree and Multiple Regression).

3. Analysis of the hybrid model Technology Affective Acceptance Model (TAAM) using a modify (hybrid) algorithms to improve the accuracy level.

1.9 Research Questions

- What are the most influential factors to acceptance and use of ICT by Teachers/Students?
- Are ICT tools available for use in the delivery of effective instruction?
- What is the degree of utilization of ICT tools for effective instructional delivery?
- What is the level of competence among lecturers and students in the use of ICT tools for effective instructional delivery?
- What are the problems affecting ICT utilization, (motivators/inhibitors)

1.10 Hypothesis

In accordance with the stated objectives and consistent with related literature, this study seek to test the validity or otherwise of the following stated hypotheses;

**H₁:** University students’ perceive pleasure/Arousal/Dominance to use ICT facilities is affected by their perceived impact (usefulness) (H₁₁), perceived ease of use (H₁₂), Inhibitors (H₁₃) and system availability (H₁₄).

**H₂:** University students’ perceived inhibitors to use ICT facilities is affected by their perceived impact (usefulness) (H₂₁), perceived ease of use (H₂₂) and system availability (H₂₃)
**H₃**: University students’ *perceived usefulness* of ICT facilities is affected by their perceived ease of use (H₃₁) and system availability (H₃₃).

![Figure 1.5: The Hypotheses Model](image)

### 1.11 Scope of the Study

The study is based on ICTs accessibility, Inhibitors, and pleasure as latent variables to improve TAM model to enhance the use of ICTs in instruction in four selected higher institutions in the south-south of Nigeria.

### 1.12 Keywords

ICT tools, Availability, Utilization competence, Effective, Instruction, Delivery, Lecturers/Students, and Tertiary institutions.