COMPUTER ANXIETY AND SELF CONCEPT AS CORRELATES OF TEACHERS ATTITUDINAL DISPOSITION TOWARDS INTERACTIVE DIGITAL TECHNOLOGIES

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Abstract
This study Investigated Computer anxiety and self-concept as correlates of teachers’ attitudinal disposition towards Interactive Digital technologies using Ex-post-facto research design. A total of 477 Business Subject teachers selected from the four Senatorial Districts of Ogun State participated in the study. Three validated instruments namely; Self Concept Scale (SCS); Computer Anxiety Scale (CAS) and Attitude to Interactive Digital Technologies Scale (AIDT) were used for data collection. Data from the study were analyzed using Multiple Regression Analysis, ANOVA and Pearson Product Moment Correlation. Findings revealed that Computer anxiety and self-concept, when combined jointly predicted teachers attitudinal disposition towards interactive digital technologies. It is recommended among others that Agency of government responsible for ICT development should invest heavily on infrastructure to facilitate teachers and students easy access to ICT use, while training and re-training programmes should be organized for teachers with a view to enhancing their capacity and overcoming the Techno-phobia Syndrome.
Keywords: Computer Anxiety, Self-concept, Interactive Digital Technologies

Introduction
The definition of information communication technology (ICT) is similar in most literature and directed towards specific objectives. Professionals in different fields called it by different names. When ICT is used in education or to foster learning it is called E-learning technology. In the broadcasting profession where ICT is used as a communication tool, it is called Communication Technology. A careful consideration of the meaning and scope of ICT make it easy to think that hardly can any profession survive or continue to be relevant without the integration of ICT.

According to UNESCO (2002), information and communication technology (ICT) may be regarded as the combination of “Informatics Technology” with other related technologies specifically, communication technology. Informatics refers to the science that deals with the design, evaluation, use and maintenance of information
processing system, including hardware, software, organizational and human aspect, and the industrial commercial and political implication of these. Information technology on the other hand is defined as the technological application of informatics in society. Communication technologies include all media - employed in transmitting audio, video, or multi-media such as cable, satellite, optic wireless, radio, infra-red, Bluetooth, amongst others.

The National Policy on ICT in Education (2010), defines ICT as an art and applied science that deals with Data and information. It encompasses all (equipment including computational machinery – computers, hardware, software, firmware etcetera and tools, methods, practices, processes, procedures concepts principles and the science) that come into play in the conduct of the information activities: acquisition, representation, processing, presentation, security, interchange, transfer, management, organization, storage and retrieval of data and information. Damil and Aslangie (2006), share similar view in the definition of ICT as a term encompassing a range of human devised, hardware, software, and telecommunication technologies that facilitate communication and sharing of information across boundaries.

The term according to them, is used to describe a range of equipment (hardware; personal computer, scanner, digital cameras; Software: database programmes and multi-media programmes) and telecommunication infrastructure (phones, faxes, modems, video conferencing equipment and web cameras) that allow one to access, retrieve, store, organize, manipulate, present, send materials and communicate locally, nationally and globally through digital media.

Simplifying the above definitions NORAD (2002) breaks ICT into the following components:

- Information Channels, such as World Wide Web, Online Data Base, Electronics Documents, Management and Accounting Systems, Internet and so on.
- Communication Channels, such as e-mail, electronics discussion groups electronic conferences, the use of cell phones etc.
- Hardware and Software use to generate, prepare, transmit and store data.

The application of ICT in Education, stimulate students interest in learning (Agbatogun 2011), changed the phase of pedagogy in the classroom (Yussuf 2012), and enhanced achievement in school subjects (Olatoye & Ogunkola 2014).

In todays’ global and competitive environment, interactive digital technology is becoming a widely accepted tool for multi-facet development in view of the flexible, quality services it offers and the potential to revolutionise the traditional education system. According to Agbatogun (2016), the last two decades have witnessed a proliferation of these computer technologies in education landscape. In developed
countries, the use of individual response pads to promote interaction in the classroom and the use of internet to provide course contents and curriculum are becoming popular. Similarly, interactive white boards, hand-held mobiles such as palm and pocket Pcs, PDAs and mobile phone are being used for teaching, learning and assessment purposes (Beeland 2014; Kara deniz 2012). As a matter of fact, the rapid change interactive digital technology is bringing to teaching and learning is almost un-believable because the learning scenario is imperceptibly like never before. Beyond the 21st century, the tendency to stop the avalanche of change seems invisible.

Across the globe, teacher’s roles and power of influence cannot be undermined in the successful implementation and sustainability of innovations and curriculum reforms (Agbatogun 2016; Albirini 2014). In the same vein, the level of success in ICT integration in schools is not dependent on quality or sophistication of the technology, but rather on the teacher’s readiness and positive disposition (Adeola 2012). For quality to be achieved in education sector, teachers must be responsive to the modern teaching demands by getting acquainted with modern technology use.

Since the focus of learning has changed from teacher – centered approach to learners centred, government and agencies of education in various states in Nigeria are not investing to procure ICT facilities and equipment in school so as to ensure increase access and use as needed (Agbatogun 2016.). To therefore revamp the education systems, there is the need to produce technologically literate workforce with positive disposition to technology use and reasonable knowledge – based economy. In order to determine teachers’ attitudes towards ICT, this study has therefore employed two frame works. The first is the Technology Acceptance Model. The Technology Acceptance Model (TAM) according to Davis (1989) cited in Agbatogun (2016) is the extent at which the perceived ease of use and perceived usefulness predicts the attitude towards the use of a technology, while attitude towards use is a signpost of individual’s intention to use, which then indicates the actual use of the technology.

Another framework given consideration in determining attitude in this study is the socio cognitive theory of Bandura which emphasizes that the self- system of an individual is a dictator of his thoughts, feelings emotions and readiness to learn. This of course is a resultant effect of the inter-play between the self-system and the environment. Olatoye (2015), Identified some problems associated with the use and attitudes towards ICT in Nigeria; high incidence of poverty, poor funding by the governments, lack of knowledge and expertise in the use of the new technology and poor condition of infrastructure especially electricity. Also, Farrel and Shafika (2014), highlighted other challenges facing ICT operations in Africa. These are poor electricity supply, lack of ICT equipment, lack of affordable access to connectivity with acceptable bandwidth etc.
Another problem identified with computer utilization and attitude is computer anxiety. Anxiety by definition is intense dread, fear, apprehension or nagging worry. Computer anxiety as defined by Agbatogun (2016), is the fear of impending interaction with a computer and other ICT facilities that is disproportionate to the actual threat presented by the computer. Those who are computer anxious may experience fear of the unknown, feeling of frustration and possible embarrassment, failure and disappointment.

Chua, Chen and Wong (2014), defined computer anxiety as fear expressed towards computer while using it, or when an individual is about to use it. However, it is worth mentioning that a pragmatic total elimination of cyber phobia is seemingly impossible. But the identification of the levels and strategies for their reduction are likewise relevant and significant. Computer anxiety directly and indirectly influences an individual’s choice of learning about computer/ICT and achieving a reasonable level of competency in computers.

Studies have shown that there is a relationship between computer anxiety and other variables such as age, frequency of computer use, computer experience, neuroticism, and individuals appraisal of computing situation (Olatoye 2015). Tsai and Tsai (2013), found a significant association between students’ meta-cognitive skills, computer achievement and their level of computer anxiety. It is imperative to note that if teachers’ ability is the engine that drives technology integration, then a motivational construct such as self-concept can be thought of as fuel for the engine.

Self-concept is an individual’s internal representation of who he/she is (Malle, 1999). According to Hattie (1992), self-concept is the product of an individual’s self-belief and self-evaluation. It is the universal understanding a sentiment being has of oneself. Self-concept has been emphasized as a key to indicator of an individual’s attitude, behavior and coping abilities. A positive self-concept is equated with positive evaluation, while negative self-concept is associated with negative evaluation.

Furthermore, researchers such as (Olatoye 2015) found that individual with poor self-concept tend to blame failure on external causes and take full credit for successes. Students are getting used to the various modern technologies ranging from electronic games, computer assisted instruction package, to the World Wide Web. Hence on a daily basis their expectation about their teachers’ integration of these technological innovations is on the high rate. Without doubt, teachers’ In the same direction, discovering teachers’ attitude towards ICT assists a lot in diagnosing existing problems in the instructional process and possible area to explore in order to help teachers.

Meanwhile, there has been dearth of studies on the combination of the two independent variables (Computer anxiety and self-concept) of this study to predict teachers’ attitudes towards computer/ICT technologies even in Nigeria. It is on this premises that this study seeks to examine the contribution of computer anxiety and self-
concept to business teachers attitudinal disposition towards interactive computer technologies.

**Research Questions**

The following research questions were raised to guide the study.

1. What is the combined contribution of computer anxiety and self-concept to the prediction of Business subject teacher’s attitudinal disposition towards interactive digital technologies?

2. Is there a significant relationship between computer anxiety and Business subject teachers’ attitudinal disposition towards interactive digital technologies?

3. Is there a significant relationship between self-concept and Business subject teacher’s attitudinal disposition towards interactive digital technologies?

**Method**

The ex-post-facto research type was adopted in this study. A total of 477 business subject teachers were purposely elected from schools in the four geo-political zone of Ogun State. Three instruments were used for data collection.

1. **Self-concept scale (SCS)**

   The self-concept instrument used in this study was originally developed by Cambra and Silvestre (2003). The adapted scale consists of 23 items (Yes/No), which are connected to three dimensions of self-concept (academic, social and physical). The instrument was re-worded to reflect measuring teachers’ self-concept in that the original instrument was structured to measure the self-concept of students. Items 14, 9, 13 and 17 were targeted towards measuring teachers’ academic self-concept, while items, 3, 5, 7, 8, 10, 12, 1, 16, 21, 22 and 23 were raised to assess teachers’ social self-concept and items 2, 6, 11, 15, 19 and 20 were generated to measure teachers’ physical self-concept. The instrument was given to two test–analysts in order to establish its face and content validity. Over previous studies, the original scale Cronbach's efficient alpha was 0.80 and 0.75. The reliability of the scale is ascertained in this study with a Cronbach co-efficient alpha of 0.76.

2. **Computer Anxiety Scale (CAS)**

   The teachers’ computer anxiety was measured by a 19 item self-reported computer Anxiety Rating Scale designed and validated by Heinssen, Glass and Knight (1987). The word rating in title of the adapted instrument was stepped down for the purpose of use in this study. The tool elicited information about participants feeling of competency and anxiety with respect to computer/ICT usage.
The participants responded on a 4-point likert scale (from strongly agree = 1 to strongly disagree = 4). The instrument was given to two educational technologists and a psychometrician for validity assessment, while the adapted instrument has a test-re-test reliability of 0.89.

3. **Attitude to Interactive Digital/Digital Technologies Scale AIDTS**

To measure teachers’ attitude towards interactive computer technologies, a researcher’s self-designed scale named Attitude to Interactive Computer Technologies Scale (AICTS) was used. The instrument measured the attitude of participants towards computer technologies based on the perceived ease of use and perceived usefulness of computers. The questionnaire comprised 20 items and each item was structured in 4-point Likert scale ranging from a score of 1 to 4, with 1 = strongly agree, and 4 = strongly agree. Two university Lecturers of computer science and a Psychometrician scrutinized the items of the scale in order to ascertain its validity. Their observations and comments were given due consideration before the final draft of the instrument was produced. The questionnaire was pilot tested on a group of teachers (N = 40), teaching in Lagos State. The Cronbach Co-efficient alpha of the instrument was 0.71.

The instruments were administered to teachers in all the selected schools with the support of four research assistants after due permission had been granted by the school principals. The data from the study were collated and analyzed using the Multiple Regression Analysis, ANOVA and Pearson Moment Correlation (PPMC).

**Presentation of Findings**

**Research question 1**: What is the combined contribution of computer anxiety and self-concept to the prediction of Business subject teachers’ attitudinal disposition towards interactive computer technologies?

**Table 1: Combined contribution of computer anxiety and self-concept as predictors of Business subject teachers’ attitudinal disposition towards interaction digital technologies.**

<table>
<thead>
<tr>
<th>Model</th>
<th>sum of Square</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>sg</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>39693.285</td>
<td>2</td>
<td>19846.642</td>
<td>318.699</td>
<td>0.00</td>
<td>Significant</td>
</tr>
<tr>
<td>Residual</td>
<td>29517.847</td>
<td>474</td>
<td>62.274</td>
<td>(P&lt;0.05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>69211.132476</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1 above shows that computer anxiety and self–concept when taken together significantly predict Business Subject teachers attitudinal disposition towards interactive digital technologies \((F = 318.699; \ P<0.05)\). The regression model also reveals that computer anxiety and self–concept jointly contributed 57.4% to the variance of Business subject teachers’ attitudinal disposition \((R^2 = .079, \ P<0.05)\). Computer anxiety and self–concept are therefore important factors predicting teachers attitudinal disposition towards interactive digital technologies.

**Research Question 2:** Is there a significant relationship between computer anxiety and Business subject teacher’s attitudinal disposition towards interactive digital technologies?

**Table 2: Relationship between computer anxiety and teacher attitudinal disposition towards interactive digital technologies**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>Pearson r</th>
<th>Sg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer anxiety</td>
<td>477</td>
<td>60.2</td>
<td>7.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitudinal deposition towards</td>
<td>477</td>
<td>61.2</td>
<td>7.4</td>
<td>0.8</td>
<td>0.00**</td>
</tr>
<tr>
<td>Interactive digital technologies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Findings from table 2 above indicate a positive relationship between computer anxiety and business subject teachers’ attitudinal disposition towards interactive digital technologies. An r-value of 0.8 is an indication of a positive relationship. Hence, positive and significant relationship exists between computer anxiety and business subject teachers’ attitudinal disposition towards interactive digital technologies.

**Research question 3:** Is there a significant relationship between self–concept and business subject teachers attitudinal disposition towards interactive digital technologies?

**Table 3: Relationship between self–concept and teachers attitudinal disposition towards interactive digital technologies.**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>Pearson r</th>
<th>Sg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer anxiety</td>
<td>477</td>
<td>52.3</td>
<td>5.3</td>
<td>0.6</td>
<td>0.00**</td>
</tr>
<tr>
<td>Attitudinal deposition towards</td>
<td>477</td>
<td>50.4</td>
<td>5.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDY</td>
<td></td>
<td></td>
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Findings from table 3 above reveals positive relationship between self – concept and business subject teachers’ attitudinal disposition towards interactive digital technologies. An r value of 0.06 is an indication of a positive and significant relationship. Hence positive relationship exists between self – concept and business subject teachers’ attitudinal disposition towards interactive digital technologies.
Discussion of Results
In this study, three questions were raised and answered. Findings from research question one revealed that computer anxiety and self-concept when combined jointly predict teachers’ attitudinal disposition towards interactive digital technology. Seemingly corresponding with the Outcome of this study is the finding of Agbatogun (2016) and Namilu and Cayhan (2014), that individuals who perceive themselves as computer introverts do have a higher level of computer anxiety and thus tend to exhibit unwelcoming attitude towards ICT use. Meanwhile, that computer anxiety, and self-concept jointly predicted teachers’ attitudinal disposition towards interactive digital technologies is not out of place because this outcome is more or less a reflection of natural phenomenon and physiological tendencies in an individual especially when one perceives oneself as inferior towards carrying out a task that individual often feel jittery and thus exhibit unpleasant or unfriendly attitude when faced with the challenges of performing such tasks.

Finding from research question two is a significant outcome, that computer anxiety in a potent predictor of teachers’ attitude towards interactive digital technologies. One may be prompted to infer from the outcome of this study that many Nigerian secondary school teachers are still seemingly techno-phobic; hence their uptake of ICT skills for onward transfer into the education system is relatively slow, low and insignificant. The reasons for this is not far-fetched because teachers who are apprehensive about computers and digital technologies would be restricted in their level of interaction with computers, and this may have ripple effects on the quality of education; their attitude may be contagious to their students. Students’ academic goals may be disrupted and the entire education quality abased.

The result of this study further revealed that self-concept significantly predicted the teachers’ attitude towards interactive digital technologies. It is quite obvious that the issue of ‘self’ assessment in relation with “performance” is important because no individual can out-perform him or herself. What an individual think about his/her ability of performance in a thing, an event, or a task dictates his/her attitude (positive or negative) towards such. By implication, what many teachers think about themselves in relation to ICT use often dictate their attitude towards the acceptance, acquisition of knowledge, skill, integration and effective use of ICT. Hence, the relevance of this outcome to the integration of ICT into education.

Conclusion and Recommendation
In order to revamp the education system, there is the need to produce a technologically literate workforce viewed competent to rise up to the challenges of the technological innovations. There is no doubt about the fact that ICT is making continuous
changes globally. In view of this, teachers must in earnest strive to acquire the necessary knowledge and technical skills for ICT use and adopt digital technologies as prominent pedagogical tools. Government at various levels should equip schools with state of art ICT infrastructure for pedagogical purposes. Furthermore, government should ensure that the teaching of business subjects in the schools witness a paradigm shift from the conventional pedagogy to paperless classroom; while more efforts are intensified on training and re-training of teachers in ICT use to alleviate Techno – phobia and boost career capacity development.

References


