Computer interest, approval and confidence of secondary school students in three selected local governments of Lagos State (Nigeria): Implications for global computerization

O.F. Adebowale, I.A. Adewale and F.M. Oyeniran
Obafemi Awolowo University, Ile-Ife. Nigeria.

ABSTRACT

Nigerian secondary school graduates are not normally examined for their proficiency at computer and internet use but are repeatedly required to employ such skills in applying for certification and placement examinations. In 2005, in her bid to develop functional computer competencies among secondary school students as part of the global drive for computerization, the Nigerian Lagos state government equipped 40 secondary schools with microcomputer-fitted laboratories which were also connected to the Internet. Three years on, this study was designed to evaluate the computer interest, approval and confidence possessed by the students with the aim of encouraging other state governments in the country and other countries of similar development status to take a cue and also to suggest ways of improvement. One hundred students were selected randomly from the Senior Secondary III classes of each of the six schools equipped with computers by the state government in three local government areas to participate in the study. The instrument used was designed to measure students' interest, approval and confidence at using computers and were administered on the subjects by their ICT subject teachers. Data analyses employed descriptive statistics (means and frequencies), t-test and ANOVA. The results showed that the students possessed high levels of interest, approval and confidence in the use of computer and its other concerns. Female students were found to develop more interest than their male counterparts. On the basis of field of study, vocational students seem to excel in interest and approval. Students aged 19 to 21 seem to perform better in approval of computer and its concerns, but no age differences were found in interest and confidence.

Keywords: *Computer interest, approval, confidence, computing, skills, gender, age, field of study.*

INTRODUCTION

The usefulness of microcomputers is no longer in contention; they provide a range of functions that, otherwise, would be generally more time consuming and inefficient (Whitrow, 1999). They are able to store, retrieve, alter and present large volumes of information easily (Jong, 1994). Furthermore, computers are ever-increasingly taking on important roles within the workforce. They are used as a source of information, for storage of data, for word processing, for communication and for data analysis. As a result, the public demands that school-leavers be skilled in the use of computers for their future employment. Whitrow (1999) posited that the efficiency and cost cutting measures that microcomputers provide makes competence in using them to become not only an advantage but more often a necessity.

Computer literacy has been described as a basic skill required for success in many academic areas and career fields (Campbell 1990). Winkle and Mathews (1982) defined computer literacy as a basic survival skill involving the things the individual needs to know about and needs to do with computers in order to function completely and effectively in the society. These account for society's attitude that microcomputers are now fundamental elements in the education of students

(LaMont Johnson, 1997) and that student should learn how to competently and applicably use them.

In Nigeria, just like Cambell (1988) predicted, the knowledge of computer has joined (or even surpassed) the knowledge of mathematics as a critical filter for employment opportunities in many opportunities most individuals may wish to pursue as careers. Also Compton, Burkett and Burkett (2002) predicted that the computer revolution will continue to have more ubiquitous impact on the lives of the individuals through economic, cultural and social institutions that impact society.

Meanwhile, an average Nigerian student is assumed to possess enough computer knowledge to enable him/her access the Internet while registering for their certification and placement examinations like Secondary School Certificate Examination (SSCE)(conducted by the West African Examination Council (WAEC) and the National Examinations Council (NECO)), and University Matriculation Examinations (UME) and Polytechnic and College of Education Entrance Examinations (PCE) (conducted by the Joint Admissions and Matriculations Board (JAMB)) respectively. This precludes any attempt at examining how much knowledge or understanding of the computer, or even the internet application the individual possesses.

As soon as the individual gets admitted into one of the institutions of higher learning (particularly the universities) he/she is further required to fill different forms online such as biodata, course registration, accommodation registration and even check his tutorial group and results online, also without any recourse to finding out how much prior knowledge the student has been exposed to, after all computer knowledge were not earlier examined in any of the aforementioned examinations.

This may have been the situation envisaged by the Lagos State government in the country, when in 2005 she launched a program tagged "Global Computerization Project" which encompassed among other components, an establishment of both local and wide area (internet) networking of the state apparatus as well as the attendant introduction of ICT into secondary schools. It also saw the provision of forty secondary schools with twenty microcomputers each, their immediate connection to the internet, development of a curriculum for the "ICT in Schools" project, retraining of tutors who were expected to implement the curriculum and establishment of digital villages where trained teachers and students may go for drill and practice after school or during the weekends. The objective of the program can be better captured in the governors' speech printed in the programme manual of the National Science and Technology week of the Lagos State Ministry of Science and Technology (MOST, 2005):

> *"As a mark of the government commitment to spreading computer knowledge and for students to be able to compete favourably with their peers in other parts of the country and the world in general……..the objectives of this programme comprise:*
> - *Teaching of computer competencies in secondary schools*
> - *Building sustainable computer literacy amongst students in the state.*
> - *Improvement in the learning process through provision of computer facilities in secondary schools and direct use of these facilities for skills acquisition.*
> - *Greater empowerment for students to active roles in a developmental paradigm*
> - *Laying the foundation for the students to meet the challenges of the modern times*
> - *Employment of information technology as a strategic tool for human capacity.*

Three years on, a need therefore arises to assess the computer characteristic of the students who must have romanced with the computer and the internet facilities for at least, more than a year.

ADOLESCENT COMPUTER CHARACTERISTICS

Perhaps, Nigerian computer users are just passing through the 'familiarization' and 'acquisition' phases of computers as identified by LaMont Johnson (1997). Schools and governments are investing in large numbers of computers as well as the development of Information Technology (IT) curriculum subjects and departments and professional development programs. Also educational institutions have sought to improve the standard of computer literacy taught and students' ability to use and apply computer-related skills (Hancock, 1997). Nash and Moroz (1997) and Sherman (1998) however cautioned that simply studying computing, for the sake of learning about computers, is insufficient in helping students develop computer-related skills and knowledge for use outside of the school and for their future. Therefore, it is important that students use microcomputers in classrooms in ways that are efficient, practical, relevant and useful for a range of outcomes.

This is expected to be achieved through an integrated computer curriculum in which students learn how to use functions of programs like Word, Excel, PowerPoint, the Internet and E-mail in a variety of curriculum subjects to achieve a range of objectives and develop computer and curriculum-related skills and attitudes (Whitrow, 1999). Furthermore, Kay (1992) in Levine & Donitsa-Schmidt (1997) asserted that students' success at developing computer-related skills is dependent upon their commitment to learning how to use computers. Researchers have proposed that positive attitudes toward computers, high computer self-efficacy and lower computer anxiety levels could be important factors in helping people learn computer skills and use computers (e.g., Busch, 1995 in Sam, Othman and Nordin, 2005). Woodrow (1991) claimed that students' attitudes toward computers were critical issues in computer courses and computer-based curricula. Sam, Othman and Nordin (2005) concluded that monitoring the user's attitudes toward computers should be a continuous process if the computer is to be used as a teaching and learning tool. Other attributes, such as the relationship with gender and age (Morris, 1988-1989) and computer anxiety (Paxton & Turner, 1984) were also shown to be related to attitudes toward computers (or computer attitude).

In general, attitudes can be defined as a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object (Fishbein & Ajzen, 1975 in Schwarz, Almer-Jarz, and Wdowiak, 2006).They are relatively less stable than personality traits and can be changed both across time and across situations in virtue of individual's interaction with the environment (Robinson, Stimpson, Huefner, and Hunt,1991 in Schwarz et al, 2006). Since attitudes are learnt, they are moldable i.e. they change with experience of the stimulus objects and with social rules or institutions (Binder & Niederle, Undated). According to Whitrow (1999) computer-related attitudes influence students' desire to use computers, their desire to enroll in computer-related subjects and courses, and their choice of career path. Students' computer-related attitudes are also directly related to their prior experiences and use of computers (Levine & Donitsa-Schmidt, 1997).

Different researches have been conducted on how attitudes toward computers influence the future use of and behaviour toward computers (e.g. Fann, Lynch, and Murranka, 1988-89; Woodrow, 1991; Levine & Donitsa-Schmidt, 1997); the use of computers in optional circumstances (Fann *et al*., 1988-89), acceptance of computers (Selwyn, 1997) as well as future subject enrolment at school and the attendant selected career path (Busch, 1995; Levine & Donitsa-Schmidt, 1997). Consequently, Nash and Moroz (1997) supported the view that evaluation of computer attitudes is an important technique in response to the current trend of computers becoming more centralized in education through integration. This study is therefore focused on three aspects (interest in computer use, statement of approval to computer and computer related concerns as well as confidence demonstrable by the respondent in using computer) as components of the respondent's computer attitude.

PURPOSE OF THE RESEARCH

This research looked at two research objectives. It sought to evaluate the computer characteristics of Lagos state secondary school students with the view to assisting policy makers in deciding which aspects of the programme requires special attention and in what form(s). It also sought to determine variations in the computer characteristics across sociodemographic variables like sex, age and students' field of study with the aim of encouraging the government of other states in Nigeria and other countries of similar developmental attainments to take cue of effective introduction of computers in to their schools. Specifically, this research investigated the following research questions:
1. What is the distribution of different attitude parameters among the secondary school students under study?
2. Are there significant differences in the attitude parameters on the basis of socio-demographic factors like gender, age and field of study?

METHODOLOGY

The research adopted a descriptive survey design. Best (1978) posited that a descriptive study is concerned with conditions or relationships that exist, opinions that are held, processes that are going on, effects that are evident or trends that are developing. It is primarily concerned with the present, although it often considers the past events and influences as they relate to current conditions.

Six hundred (600) students who participated in the study were selected by proportionate random sampling from the Educational District I (ED I) of Lagos state during the first term of the 2007/2008 academic session. Educational District I consists of three zones (each coinciding with a local government area) of Agege, Ifako/Ijaye and Alimosho. Two schools were selected from each of three zones (making six schools) by the state government as part of the forty schools (from the whole state), each equipped with twenty microcomputer-fitted laboratories and these were the schools selected for the study. One hundred (100) students were randomly selected from the four SS III arms (science, arts, commercial and vocational) of each of the six schools by asking all the SS III students to pick a crumpled paper from a basket and those whose pick contained the word 'yes' were selected for participating in the study. Their field of study were then requested and recorded.

The instrument used was an abridged version consisting of three sections. Students attitude were measured by sections A, B and C which solicited information about their interest, statement of approval and confidence in the use of the computer respectively. Section A consists of 12 items (example: Just hearing the word "computer" makes me feel interested), Section B consists of 13 items (example: *Computers make users more productive*) while Section C consists of 8 items (example: *I am confident in my ability to master new skills with computers*). Some of the items were adapted from the Computer Attitude Scale developed by Nickell and Pinto (1986) while others were derived from other Computer attitude questionnaires developed by the Texas Center for Educational Technology (1998), Internet Education Research Group (undated) and the Institute for the Integration of Technology into Teaching and Learning (2003). The respondents were required to provide response in five categories corresponding to their level of agreement with the statements given as "Strongly agree" "Agree" "Undecided" "Disagree" "Strongly disagree". Copies of the questionnaire were earlier circulated to 42 students who did not eventually participate in the study. Their responses were used to obtain validity and reliability information. It also necessitated deleting three items from section A, two from section B and four from section C. The final version of the instrument gave a mean Cronbach's Alpha estimate of 0.81 (0.81, 0.77 and 0.85 for Sections A, B, and C respectively) and split-half value of 0.79 (0.81,

0.79 and 0.77 for sections A, B and C respectively) showing that the instrument can be said to be very reliable for the type of study for which it is designed.

The administration of the instrument was done by the ICT subject teachers in each of the schools under the close supervision of the researchers. The respondents were allowed 45 minutes to fill out their response after each respondent has been allotted a copy of the instrument. Out of the 600 pieces of the questionnaire circulated only 482 (80.3% return rate) could be used for the study, others were either not returned or not properly filled. The characteristics of the participants were as presented in Table 1.

Table 1: Descriptive presentation of the study sample characteristics

Respondents characteristics	Descriptions	Frequency	Percent
Gender	Male	248	51.5
	Female	188	39.0
	Missing	46	9.5
	Total	436	100
Age	10-12yrs	47	9.7
	13-15yrs	202	41.9
	16 – 18yrs	171	35.5
	19 to 21yrs	62	12.9
	Total	482	100
Field of Study	Sciences	86	17.8
	Commercial	130	27.0
	Arts	184	38.2
	Vocational	82	17.0
	Total	482	100

All the items were scored by allotting 5 to a "Strongly agree" response 4 for "Agree" 3 for "Undecided", 2 for "Disagree" and 1 for "Strongly disagree", except for negative items in items 9 and 10 in section A, items 5, 9 and 11 in Section B, and items 3, 4 and 7 in section C in which the scores were transposed. Data analysis was by using descriptive analysis, t-test analysis and ANOVA provided in the SPSS 14 Software. The results were as presented in Table 2.

RESULTS

Research Question 1: What is the distribution of different attitude parameters among the secondary school students under study?

To address this question the relative distribution of respondents across parameter groupings of attitude (interest, approval and confidence) was undertaken and the results were as presented in Tables 2 to 4. Table 2 represents a descriptive analysis of the responses given by the respondents to section A of the questionnaire. Total score obtained by adding up respondents' score on each item ranged from 20 to 65. Those who score less than 30 were said to possess poor level of interest, 30 to 40 – Low level of interest, 40 to 50 were said to have high level of

interest while those who score above 50 were said to have enthusiastic level of interest in computer and its concerns.

Table 2: Relative distribution of respondents across different degrees of interest

Degree of Interest	Frequency	Percent
Poor interest	2	0.4
Low Level of interest	28	5.8
High Level of interest	238	49.4
Enthusiastic interest	214	49.4
Total	482	100.0

Table 2 shows that a considerable percentage of the respondents possess an enthusiastic (44.4%) and a high level (49.4%) of interest in the use of the computer with only a paltry of 6.2% demonstrating low (5.8%) and poor level (0.4%) of interest in the use of computers. We can therefore conclude that perhaps, the introduction of computer into the said secondary schools have stimulated the interest of the students to invest their time in learning to use, actually using and deciding to possibly take up future vocations in computer and computer related fields, a development that can be describe to be a healthy one.

Table 3 represents a descriptive analysis of the responses given by the respondents to section B of the questionnaire. Total score obtained by adding up respondents' score on each item ranged from 35 to 65. Those who score 35 to 45 were said to possess low level of approval, 46 to 55 – Moderate level of approval, 56 to 65 were said to have high level of approval of computer and its concerns.

Table 3: Relative distribution of respondents across different degrees of approval

Levels of Approval	Frequency	Percent
Low Level of Approval	54	11.2
Moderate Level of Approval	242	50.2
High Level of Approval	186	38.6
Total	482	100.0

Table 3 shows that the greatest proportion (50.2%) of the respondents possesses moderate level of approval for computer usage and other concerns, although a sizeable proportion (38.6%) possessed high levels. A considerable proportion (11.2%) still possesses low level of approval for computer usage and concerns. It will be preferable if the proportion found in this group is drastically low, perhaps less than 1%, given the technological advancement levels already attained in the country particularly in the information and communications sector.

Table 4 represents a descriptive analysis of the responses given by the respondents to section A of the questionnaire. Total score obtained by adding up respondents' score on each item ranged from 0 to 40. Those who score 0 to 10 were said to be poor confident, 11 to 20 – Fairly confident, 21 to 30 were said to be moderately confident while those who score 31 to 40 were said to be very confident computer usage and its concerns.

Table 4: Relative distribution of respondents across different degrees of confidence

Levels of Confidence	Frequency	Percent
Poorly Confident	2	.4
Fairly Confident	4	.8
Moderately Confident	246	51.0
Very Confident	230	47.7
Total	482	100.0

From Table 4, the proportion of students who are poorly confident in the use of the computer is drastically low (0.4%) as well as those who developed fair level of confidence (0.8%). In fact, most of the students are either of moderate confidence (51%) or they have high level of confidence (47.7%) as can be seen in the table above. This also portends a good omen for the technological advancement of the Nigerian nation.

Research Question 2: Are there significant differences in the attitude parameters on the basis of socio-demographic factors like gender, age and field of study?

To address this research question, respondents' scores on the three parameters were subjected to test of differences via ANOVA and the results were as presented in Tables 5 to 7. Table 5 presents test of difference in attitude parameters across gender groupings (male/female). The result was as shown in Table 5 below.

Table 5: Test of difference in attitude parameters across gender groupings

	respondent	N	Mean	Std.	T	Sig.
Respondents' Interest	Male	248	48.693	5.7582	-2.042	.042
	Female	234	50.297	5.7301		
Respondent Approval of computer concerns	Male	248	52.741	6.7917	-.529	.598
	Female	234	53.191	5.3667		
Respondents' confidence at using computers	Male	248	30.088	3.8148	.834	.405
	Female	234	29.553	5.6504		

In table 5 above, results shows that there was no significant difference in the confidence and approval of computer usage and other concerns demonstrated by male and female students (t for Approval = -0.529, p >0.05; t for confidence = 0.834, p >0.05. However a significant difference was shown between male and female students in the level of the interest demonstrated in computer usage and concerns (t = -2.402, p < 0.05). The female students seem to demonstrate more interest (Mean = 50.30) in computer usage and concerns than the boys (Mean = 48.69).

The researchers also examined whether a difference could be found in the attitude parameters on the basis of students' field of study. Consequently, the students' scores on the attitude parameters were subjected to test of difference via ANOVA on the basis of their fields of study. The result was as presented in Table 6.

Table 6: Test of difference in attitude parameters on the basis of students' field of study

		N	Mean	Std.	F	Sig.
Respondents' Interest	Arts	86	45.8372	5.91177	13.725	.000
	Commercial	130	49.4000	5.05223		
	Sciences	184	50.7545	5.28315		
	Vocational	82	64.0000	.00000		
	Total	482	49.5136	5.77942		
Respondent Approval of computer concerns	Arts	86	49.5814	6.26872	16.868	.000
	Commercial	130	50.4615	5.83919		
	Sciences	184	55.2364	5.13475		
	Vocational	82	60.5000	2.12132		
	Total	482	52.7682	6.15002		
Respondents' confidence at using computers	Arts	86	28.9535	4.07053	.733	.533
	Commercial	130	30.0462	4.07519		
	Sciences	184	30.1545	5.02140		
	Vocational	82	30.5000	13.43503		
	Total	482	29.8909	4.65003		

In table 6, significant differences were obtained in the interest in ($F = 13.725$, $p < 0.05$) and approval of ($F = 16.868$, $p < 0.05$) computer usage and concerns on the basis of the students' field of study. In both cases, students in the vocational field demonstrated superior performance in the two constructs – Interest (mean = 64) and Approval (mean = 60.5)compared to students in other fields of study. They still perform a similar feat under confidence, but the difference was just not significant ($F = 0.733$, $p > 0.05$).

The researchers also examined whether a difference could be found in the attitude parameters on the basis of students' age groupings. The students were grouped into four on the bases of the age grades -10 to 12 years, 13 to 15, 16 to 18 years and 19 to 21 years. Consequently, the students' scores on the attitude parameters were subjected to test of difference via ANOVA on the basis of their age groupings. Table 7 shows that there was no significant difference among different age groups of students under study in terms of interest and confidence in computer use and its other concerns ($F = 2.449$, $p > .05$ and 2.596, $p > .05$). However, significant difference was obtained in the approval the respondents gave to computers, its use and other concerns ($F = 2.717$, $p > .05$).

Table 7: Test of difference in the computer attitude of students across age groupings

		N	Mean	Std. Deviation	F	Sig.
Respondents' Interest	10-12yrs	47	47.1429	9.37067	2.449	.065
	13-15yrs	202	49.0490	5.65576		
	16 – 18yrs	171	50.2963	5.65067		
	19 to 21yrs	62	57.5000	10.60660		
	Total	482	49.6804	5.87938		
Respondent Approval of computer concerns	10-12yrs	47	50.1429	10.41519	2.717	.046
	13-15yrs	202	52.0294	6.03366		
	16 – 18yrs	171	53.9444	5.98570		
	19 to 21yrs	62	58.5000	3.53553		
	Total	482	52.9726	6.23832		
Respondents' confidence at using computers	10-12yrs	47	30.7143	6.47339	2.596	.053
	13-15yrs	202	29.5098	5.40397		
	16 – 18yrs	171	30.5741	3.77944		
	19 to 21yrs	62	37.5000	2.12132		
	Total	482	30.1461	4.74357		

DISCUSSION

Different kinds of anxiety have been expressed towards the introduction of computers and internet into secondary schools. This research has indicated that students' interest, approval and confidence at constructively using computer can be stimulated through the introduction of computers into their schools.

Research question 1 was posed to survey how the students are relating with the computer in terms of their interest, approval and confidence in its use and other concerns which may impact positively on their future positive attitude towards computing and possibly taking up vocation in this field. The results indicated that most of the students possess high levels of interest, approval and confidence in computer usage and its ancillary concerns. Although it appears that they still regard it as a secretarial instrument as shown in the gender stereotypic believe that secretarial jobs were to be reserved for the female sex as shown in the greater interest shown in computer use and its concern by the female participants. This is in agreement with the findings of Worell and Goodheart (2006). They posited that girls tend to show a greater interest in computer activities at school particularly when used as learning, artistic and communication tools. However, stronger campaign should be mounted to further stimulate the interest of male students in the computer particularly the aspects of hardware and software engineering, internet browsing for information, and other computer concerns which may stimulate their interest in computer use and taking up computer related vocations later in future.

In the second research question, effort was made to find out if differences exist in the three attitude parameters on the basis of socio-demographic factors like gender, age and field of study. It is believed that any unhealthy differences found would be identified and marked out for redress. Female students were found to demonstrate more interest in computer usage than the male students probably as a result of the reason earlier mentioned. This was in agreement with the

findings of AlJabri (1996) among secondary school students in Saudi Arabia. Avraham (2005) quoting Morahan- Martin, Olinsky and Schumacher (1994) posited that females had a more positive attitude towards computer as they believed, more than males, that computers will assist them more with jobs, and with getting jobs. Students in vocational field who perhaps have made up their minds to pursue vocational education demonstrated superior interest (Mean = 64.0) and approval of computer and its concerns (Mean = 60.5). Even in terms of confidence the students in the vocational field still reported possessing superlative confidence in handling computers (mean = 30.5), although the difference between them and others were not significant.

A similar trend was shown when the difference was sought on the basis of the students' ages. Particularly in terms of approval, older students seem to have experience in the world of computers and hence possess greater levels of approval of computer and computer concerns. Although no significant differences were found in terms of interest and confidence across age groups. We can then safely conclude that interest and confidence in the usage of computers and its concerns cut across age groupings. Hence computerization should be extended to junior schools, primary and pre-primary schools to further enhance the development of interest and confidence in using computers, possibly taking up vocations in computers and computer related fields.

Given the introduction/acquisition stage the country is said to be passing through, the poor state of the national economy and the epileptic nature of power supply in the country, one may be tempted to assume that interest, approval and confidence in computer use and its other concerns will be very low among secondary schools, but in contrast, the result of this study has shown that most of the students under study demonstrated desirable levels of the three attitude parameters and can then be described as having positive or even enthusiastic attitude toward computer usage.

Computer vendors and manufacturers should also target investing in school computerization in a similar manner adopted by the Nigerian Lagos state government; after all this will promote the interest in purchasing more computers, computer parts and computer –related domestic equipments such as mobile handsets, digital wristwatches and clocks, etc.

Public spirited persons, non-governmental organizations, United Nations educational agencies and other educational philanthropists should divert their focus onto computerizing the schools, hoping that school heads, educational authorities, P.T.A. bodies and even the students themselves will make security provisions for them.

In the present day Nigeria and other developing countries, the problems of security of the computer systems, prohibitive cost of modern computer desktops, laptops and palmtops as well as erratic power supply should attract the attention of researcher, if the global computerization effort is to yield fruitful results.

CONCLUSION

Given the importance of computers to the modern workplace and their roles in the life of virtually all of us, it is important to ensure that students develop useful computer characteristics which will enable them to learn computer and computing in preparation for their roles in the society. Such Computer characteristics are the affective types like Interest, approval and confidence. The development of these characteristics require regular appraisal to refocus of all stakeholders particularly teachers and school counsellors who can help the learners develop these healthy characteristics. Governments of developing countries need to invest into introducing computers into primary and secondary schools to further stimulate learners' interest and positive attitude

toward computer and computing. Computer professionals in the developed world also need to target these potential market centres to further widen their business horizons.

REFERENCES

AlJabri, I.M. 1996. Gender Differences in Computer Attitudes among Secondary School Students in Saudi Arabia. Journal of Computer Information Systems; pp: 70-75; Vol: 37

Avraham, L. 2005. Differences in the way males and females perceive computers retrieved from http://eserver.org/courses/spring97/76100o/contributions/avraham/ on 24th March 2009.

Best, J.W.1978. Research in Education. New Delhi: Prentice Hall.

Binder, M and Niederle, U. Undated. Institutions as Determinants of Preference Change – A One Way Relation? Retrieved on 29th August, 2008 from https://papers.econ.mpg.de/evo/discussionpapers/2006-07.pdf

Burns, R., 1997, Introduction to Research Methods, Third Edition, Longman, Australia.

Busch, T., 1995, 'Gender Differences in Self-Efficacy and Attitudes Toward Computers', Journal of Educational Computing Research, 12(2): 147-158.

Campbell, N.J. 1988. Correlates of Computer Anxiety of Adolescent Students. Journal of Adolescent Research Vol 3 No. 1 Pg 107 – 117.

Campbell, N.J. 1990. High school students' Computer Attitudes and Attribution: Gender and Ethnic Group Difference. Journal of Adolescent Research Vol 5 No. 4 Pg 485 – 499.

Compton, D.M., Burkett, W.H. and Burkett, G.G. 2002. The Prediction of Perceived Level of Computer Knowledge: The Role of Participant Characteristics and Aversion towards computers. Informing Science Vol 5 , No. 4 Pg. 219 – 224.

Fann, G., Lynch, D. & Murranka, P. 1988-89. 'Integrating Technology: Attitudes as a Determinant of the Use of Microcomputers', Journal of Educational Technology Systems, 17(4): 307-317.

Fishbein, M. & Ajzen, I., 1975. Belief, Attidude, Intention and Behavior: An introduction to theory and research. Addison-Wesley Reading.

Hancock, V. 1997. Creating the Information Age School', Educational Leadership, 55(3): 60-63.

Institute for the Integration of Technology into Teaching and Learning , IITTL 2003. Computer attitude Questionnaire retrieved 22nd October 2006 from http://www.iittl.unt.edu/pt3II/WordFiles/caq.doc

Internet Education Research Group. Undated. Computer Attitude Questionnaire retrieved 22nd October 2006 from http://ierg.csd.auth.gr/questionnaires/CASFen.pdf

Jong, A., 1994. A Study of Attitudes Towards Computers by Primary School Students, B. Ed. (Masters), Flinders University of South Australia.

Kay, R., 1992. Understanding Gender Differences in Computer Attitudes, Aptitude, and Use: An Invitation to Build Theory. Journal of Research on Computing in Education, 25(2): 159-171.

LaMont Johnson, D., 1997, 'Integrating Technology in the Classroom: The Time Has Come', Computers in the Schools, 13(1-2): 1-5.

Levine, T. & Donitsa-Schmidt, S., 1997, "Commitment to Learning: Effects of Computer Experience, Confidence and Attitudes', Journal of Educational Computing Research, 16(1): 83-105.

Ministry of Science and Technology, Lagos State (MOST), 2005. Programme Manual of the National Science and Technology week.

Morahan-Martin, J., Olinsky, A. and Schumacher, P. 1994. Gender Differences in Computer Experience, Skills, and Attiutdes Among Incoming College Students. Journal of Educational- Computing Research, Vol. 11 No 4

Morris, D. C. 1988-1989. A survey of age and attitudes toward computers. *Journal of Educational Technology Systems*, 17, 73-78.

Nash, J. & Moroz, P., 1997, 'An Examination of the Factor Structures of the Computer Attitude Scale', *Journal of Educational Computing Research*, 17(4): 341-356.

Nickell, G. S. & Pinto, J. N. 1986. The computer attitude scale. *Computers in Human Behavior, 2*, 301-306.

Paxton, A. L., & Turner, E. J. 1984. The application of human factors to the needs of novice computer users. International Journal of Man-Machine Studies, 20, 137-156 retrieved from http://www.mnstate.edu/nickell/cas20.pdf on 3rd September 2006.

Robinson, P. B., Stimpson, D.V., Huefner, J. C. & Hunt, H.K. 1991. An attitude approach in the prediction of entrepreneurship. Entrepreneurship Theory and Practice, 15(4), pp. 13-31.

Sam, H. K., Othman, A. E. A., & Nordin, Z. S. 2005. Computer Self-Efficacy, Computer Anxiety, and Attitudes toward the Internet: A Study among Undergraduates in Unimas. Educational Technology & Society, 8 (4), 205-219.

Schwarz, E. J. Almer-Jarz, D.A. and Wdowiak, M. A. 2006. A Structural model of entrepreneurial intent among students: findings from Austria in Urbano, D. (Ed.) Diversity in Entrepreneurship. 3rd Inter-RENT Online Publication of the European Council for Small Business and Entrepreneurship (ECSB) retrieved on 29th August, 2008 from http://www.ecsb.org/doc/Inter-RENT_Publication_2006Revised.pdf

Selwyn, N., 1997, 'Students' Attitudes Toward Computers: Validation of a Computer Attitude Scale for 16-19 Education', Computers and Education, 28(1): 35-41.

Shashaani, L., 1993, 'Gender-Based Differences in Attitudes Toward Computers', Computers and Education, 20(2): 169-181.

Sherman, L., 1998, 'The Promise of Technology', Northwest Education Magazine, Spring, online at http://www.nwrel.org/nwedu/spring_98/article2.html

Texas Center for Educational Technology 1998. Computer attitude Questionnaire retrieved 22nd October 2006 from http://www.tcet.unt.edu/research/survey/caq522.pdf

Worell and Goodheart, W.D. 2006. Handbook of Girls' and Women's Psychological Health. New York: Oxford University Press.

Whitrow, T.J. 1999. Integrating Computers Across the Curriculum: Students' Computer-Related Attitude Changes. Bachelor of Education (Special Education) Honours Thesis of the School of Education Flinders University of South Australia retrieved on 23 September 2008 from http://ehlt.flinders.edu.au/education/publications/THESES/WHIT99/begin.HTM

Winkle, L.W. and Mathews, W.M. 1982. Computer equity comes of age, Phi Delta Kappa, Vol. 63 pp.314-15.

Woodrow, J., 1991, 'A Comparison of Four Computer Attitude Scales', Journal of Educational Computing Research, 7(2): 165-187.

Original article at: http://ijedict.dec.uwi.edu//viewarticle.php?id=834