A CBT-Based Intervention Model for Computer Anxiety Management among first-year students at the National Open University of Nigeria in South-West Nigeria

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ABSTRACT

The study investigated the effectiveness of Cognitive Behaviour Therapy (CBT) in treating computer phobia among distance learning first-year students in south-western Nigeria. The moderating effects of age and gender were examined. Technology Acceptance Model was taken as the framework for the study, with the pre-test-post-test control group quasi-experimental design, where 55 computer anxious students first-year students who met the screening criteria were randomly allocated into the CBT and the Control groups. For screening, the Computer Anxiety Scale Revised (=0.89) with a norm of 60.0 was used, while Computer Anxiety Rating Scale (=0.86) was utilised to measure the criterion variable. Treatment lasted eight weeks using the CBT training guides. Data analysis was conducted using covariance and post-hoc multiple classification analysis at a significance level of 0.05. Participants mean age was =32.70, with 65.5% females. It was found that the treatment group was significantly affected by the management of computer anxiety among NOUN freshmen (F(1,46) = 42.492, p0.05, =0.480). Participants in the CBT had the least adjusted mean (=27.260), and the control group had a higher adjusted mean score (= 39.733). Participants in the treatment groups and the control group are significantly affected by age when it comes to computer anxiety (F(2,123)=4.548, p0.05, 0.090). There is a significant effect of age in the management of computer anxiety among the participants; gender did not significantly impact computer anxiety. It is recommended that educational and counselling psychologists should employ this therapy to reduce computer anxiety. Service providers should consider age in computer appreciation training for distance learners.

Keywords: *Cognitive behaviour therapy, computer anxiety, anxiety management, National Open University of Nigeria.*

INTRODUCTION

Anxiety is a psychological disorder which affects the normal life of individuals. Anxiety can manifest in diverse ways in an individual's life. Every human being experience anxiety with its attendant consequences at one point or the other. It is one of the most widespread and persistent human emotions that affect individuals emotionally, physiologically and cognitively. In its emotional sense, anxiety involves worries, apprehensions, and phobias toward situations and things(Akintumi, 2001). Many students in NOUN, particularly those in their first year of study, exhibit computer anxiety which constitutes a clog in the wheel of progress in their studies and a severe inhibiting factor to their performance and general achievement. A computer-anxious learner may have difficulty adjusting to an ODL environment. Oyadeyi (2018) states that "distance education in the 21st century encompasses the use of computer-mediated resources in most of its activities globally".

These tasks include registering for courses and examinations, online facilitation and tutor and computer-generated assignments and other forms of learner support. Adequate computer skills devoid of anxiety are quintessential and germane to the success of distance learners. Studies have shown a positive correlation between computer skills and programme completion by distance learners. The attrition rate is positively correlated with inadequate computer skills and computer anxiety (Ofole, Fawusi, &Oduneye, 2012). Undoubtedly, distance learners with computer anxiety find it difficult to cope and benefit maximally from the online opportunities available in the ODL environment (Oyadeyi, 2018). According to NOUN (2011), distance education today involves online technologies, such as student support services, access to electronic information, virtual libraries hosting electronic databases, eBooks, free research publications, learner management systems and collaboration with faculty and students. Students with computer anxiety are likely to experience academic failure and lower levels of comfort in their studies; it can potentially result in dropout, lack of interest in studying, and unnecessarily high levels of physical and emotional stress. Global competition and globalisation have contributed to the acceptance of interactive computer technologies for multi-faceted development in our modern environment. Despite the extensive number of

study centres set up by open and distance learning (ODL) institutions, it is often difficult to keep students engaged and enrolled in distance learning because of the physical separation between teachers and students, and among students. Computer technology is the driving force of the information age and the engine of modern civilisation (Ituen, 2009).ODL's education programmes are dominated by computers worldwide. Despite this fact, it is not good news that many prospective students of distance learning experience computer anxiety; this may frustrate the speed at which they would achieve their educational objectives. The problem of computer anxiety has plagued many users since its invention. There is evidence that ICT phobia can adversely affect distance learners (Oluwole, 2009; Wang & Newlin, 2002). Distance learners may suffer from computer anxiety due to adverse effects they might have on their performance. Chau, Chen, and Wong (1998) define computer anxiety as a fear of computers or the inability to use them effectively because of apprehension.

Cognitive Behaviour Therapy (CBT) is a therapy that has the potential to manage or reduce different forms of anxiety (Busari, 2007; Snowden, Steinman &Fredick, 2008); hence it was adopted as an intervention strategy in this study. It is a form of psychotherapy that emphasises the essential roles of accurate and faulty thinking in individuals' actions. Cognitive behaviour therapy can change behaviour or mood (Busari&Uwakwe 2001). Cognitive behaviour therapy also focuses on the learning process and how individuals' cognitive processes and emotive processes are affected by external factors. In the context of this study, cognitive behaviour therapy was set up to help students learn how to manage their fears about the computer. By doing this, participants learned to change their thinking and strengthen their coping skills. They were trained to recognise, monitor and change their self-defeating and irrational thoughts and assumptions in favour of rational behaviour patterns resulting in improvement of conditions. CBT is an intervention that has been used and has significant effects on anxiety management. An investigation by Rosen, Sears & Weil (1993) attempted to reduce computer anxiety among students by incorporating two individual and group treatment modules. 162 participants participated in a course in which they had to interact with computers. The students exhibited marked improvements in computer phobia, knowledge, and behaviour following the

five-week training programme. Psychological reactions to computers were eliminated similarly by all treatment modules. A second comparative study showed (a) client dropout rates decreased by half, graded performance in computer courses increased significantly, and (b) fear, thoughts, and understanding in the 5-week programme were transformed compared to similar participants in other computer programmes. Following up with 41 participants, six months later showed substantial gains in computer knowledge and interaction. It was found that half of the clients (former computer phobics) were ready to begin a career with computers. An examination of 10 weeks of selective desensitisation programme using 16 computer-induced anxiety participants (8 computer-anxious, eight non-anxious). Brosnan and Thorpe (2006) revealed the beneficial effects of clinically derived treatments. A significant reduction in computer anxiety was seen among participants. In the second research, 30 screened computer-anxious participants underwent a one-session treatment session, of which nine were treated (n=9), and 21 were not treated.

There was a marked improvement in anxiety levels in the treated group after one academic session/year. In their study, Rathod, Kingdon, Weiden, and Turkington (2008) found that cognitive behaviour therapy (CBT) is beneficial for patients with medication-resistant symptoms of schizophrenia. A study of this type is crucial given that persistent symptoms can be disabling, cause significant distress, and increase depression, anxiety, and the risk of suicide. Cognitive therapy (CT) and systematic desensitisation therapy (SD) were compared by Fathi-Ashtiani, Salimi&Emamghohivand (2006) among high school students with test anxiety. Psychotherapy techniques significantly reduced test anxiety levels in both case groups compared to those in the control group after 12 weeks of therapy. Study results suggest psychotherapy techniques positively affected students' test anxiety levels. CBT is very helpful in improving symptoms in people with anxiety (Gould, Otto & Pollack, 1997; Douglas, Ladouceur & Leger, 2003; Linden, Zubraegel& Baer, 2005). Tabibi, Mashadi, Eshragi, Faroughi, & Ahmadi (2014), in a quasi-experimental study, found that group cognitive behaviour therapy may help children with type I diabetes cope with anxiety and depression and have better glycemic control. Thirty (30) diabetic children participated in the study; the experimental group received eight

sessions of cognitive-behavioural training. Following the post-test, the results indicated that the experimental group had been able to control anxiety more than the control group. Age and gender are factors that moderate the study. According to several studies, age plays a crucial role in determining student computer anxiety. It has been found that older and middle-aged adults have lower self-efficacy and higher levels of anxiety about using computers (Rahimi &Yadollahi, 2011; Dyck & Smither, 1994; Czaja, Charness, Fisk, Nair & Rogers, 2006; Oluwole, 2009). Also, researchers found that men and women in their older years report higher levels of computer anxiety and lower levels of computer efficacy compared to younger individuals. Some studies (Yoon, et al., 2016; Dyck & Smither, 1994) concluded that older people were generally more wary of using computers than adolescents. In contrast, Reed, Doty, and May (2005) found computer aversion to being age-independent. A frequently reported finding from the research on gender and computing (Brosnan& Lee, 1998) suggests that males use and have more experience in computers with less fear. There is increasing evidence that females hold less favourable attitudes toward computers than men (Whitely, 1997); they also experience psychological challenges regarding computers (McIlroy et al., 2001).

Using computer anxiety, motivation, self-confidence, and workplace use of computers, Birol, Bekirogullari, Etci, and Dagli (2008) examined how gender shapes these phenomena. It was found that females' scores were significantly lower than those of males, indicating that women are generally less confident than men. There was a significant difference in self-confidence scores for males and females on this scale. However, both reported confidence when using computers to accomplish work. A study by Halder and Chaudhuri (2011) found significant differences in fear of computers on a gender basis among trainee teachers in West Bengel, India. Computer anxiety was lower for male trainees than for female trainees. Similarly, Sanalan (2016) investigated computer phobia among Turkish university pre-service teachers. The findings indicated that females were significantly more apprehensive than male participants. In a study by Loyd et al. (1987), female students showed less computer anxiety than male students; they preferred using computers more than their male counterparts. The Rosen et al. (1987) study found that gender does not play an essential

role in computer anxiety despite women's more negative attitudes towards computers. Furthermore, Tunceret al. (2013) examined the degree to which computer anxiety was prevalent among vocational high school students from Tunceli University. Results indicate that gender does not impact computer anxiety in a meaningful way. In Nigeria, distance learners are faced with the challenge of computer anxiety. The resultant effects among students are avoidance of computers by learners, use of third parties to submit Tutor Marked Assignment (TMA), test anxiety, and loss of time during e-examinations.Others include procrastination in attempting computer-related tasks including assessing e-books, use of e-counselling portal, i-learn portal (despite their numerous advantages and inevitability), ignoring the Open Educational Resources (OERs), and repeatedly deferring examinations.

In Nigeria, there is little research on computer anxiety. Despite the enormity of the problem among distance learners, most studies have not addressed technology-induced anxiety among new ODL students specifically or students generally. Apart from simply recommending skill training, no studies have provided any strategies to help mitigate it. Essentially, skill training in isolation may not be enough to address the problem if other methods are not explored to build confidence, enhance acceptance of computers, or reorder thinking patterns of computer-apprehensive individuals. Researchers have speculated that those who suffer from computer anxieties because of inadequate hands-on experience and knowledge of computers are more readily treated than those with anxiety rooted in their psychological makeup (Howard &Smith, 1986). Computer anxiety has not been widely treated with cognitive behaviour therapy as a group therapy; the researcher knows only a few available instances globally. As such, the study examined cognitive behaviour therapy as a potential treatment option for computer anxiety among first-year students at NOUN in southwest Nigeria. Specifically, the study compared the computer anxiety levels of experimental and control groups to see if the intervention had any significant effect. Additionally, the study analysed the moderating effects of gender and age on the computer anxiety of the participants.

Hypotheses

Hypothesis 1: There is no significant main effect of treatment (cognitive behaviour therapy) in managing computer anxiety among participants.

Hypothesis 2: There is no significant main effect of age in managing computer anxiety among the participants.

Hypothesis 3: There is no significant main effect of age in managing computer anxiety among the participants.

Methodology

The study adopted a pre-test, post-test, control group, quasi-experimental design with a two by two by two (2 x 2 x 2) factorial matrix used in this study. The columns in the factorial matrix included two moderating variables, age (young, old) and gender (male or female), while the rows included only the treatment group (cognitive behaviour therapy) and the control group. Study participants included all fresh students of the National Open University of Nigeria in the south-west region. Two Study Centres of the National Open University Nigeria were selected using a simple random sampling technique. To detect participants with high computer anxiety, first-year students across the seven Schools (faculties) at the study centres were administered the Computer Anxiety Scale Revised by Bandalos and Benson (1990).

Thirty (30) male and female participants were randomly selected from those who scored high on the Computer Anxiety Scale in each of the two selected Study Centres. There was, however, attrition of 5 participants in the treatment group. The data were collected through Computer Anxiety Scale - Revised (CAS-R) developed by Bandalos and Benson in 1990. In studies conducted by Gos (1996), Kay (1992), and Rosen and Weil (1995), CAS-R was found to be a high level of reliability and validity. As a Likert-type questionnaire, the CAS-R has items ranging from Strongly Agree to Strongly Disagree. The examinee is forced to make choices on the scale that can be translated to weights of 1 through 5. Thus, the highest score obtainable is 115, while the lowest is 23. The CAS-R includes items that vary between positive and negative statements. A score of 60 and below indicates high computer anxiety. The authors calculated an estimate of the coefficient alpha reliabilities for 0.96. The unique nature of the sample

compelled the researcher to revalidate the instrument. Two-week test-retest reliability of the instrument revealed an alpha coefficient of 0.91, while it had an internal consistency of 0.89. The Computer Anxiety Rating Scale (CARS) is a 19-item self-report inventory developed and validated by Heinssen, Glass and Knight (1987). Respondents were asked to respond on a five-point Likert-type scale (1=strongly disagree, 2=disagree, 3=undecided, 4=agree, and 5=strongly agree). The total score ranged from 19, indicating low levels of computer anxiety, to 95, indicating a high level of computer anxiety. Test re-test reliability for the instrument was 0.79. The instrument had a Cronbach alpha of 0.86 and a reliability coefficient of 0.89 when revalidated after a two-week test. There were four stages in the treatment process, namely recruitment, pre-test, treatment, and post-test. Participants were screened using the Computer Anxiety Scale Revised during the recruitment process. In this study, low-score participants (i.e. below 60) were classified as computer-anxious. Participants were administered the Computer Anxiety Rating Scale during the pre-test phase. An eight-week treatment period (eight sessions) was allocated to the experimental group (Cognitive Behaviour Therapy). An average of one hour was spent in each session. The eight-session intervention was delivered to the experimental group as planned. Participants were serious about the intervention as they attended all sessions. A seminar on "time management strategies for open and distance learners" was presented to the Control group in place of any treatment. Both the experimental group and control group were subjected to pre-test and post-test. The data collected were analysed using the Analysis of Covariance (ANCOVA) and Scheffe Post-hoc Multiple Classification to determine the directions of differences and significance identified.

Results and Discussion

Hypothesis One: There is no significant main effect of treatment (cognitive behaviour therapy) in managing computer anxiety among participants. ANCOVA tested this hypothesis to determine if statistical significance can be established for post-test scores of participants in the management of computer anxiety using pre-test scores as covariates. Table 1 summarises the results of the analysis.

Table 1: Analysis of Covariance (ANCOVA) of Interactive Effects of Computer Anxiety Scores of Participants in Treatment and Control Groups, Age and Gender

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2391.212[a]	8	298.902	8.376	.000	.593
Intercept	357.912	1	357.912	10.029	.003	.179
Prescore	1157.446	1	1157.446	32.433	.000	.414
Trtgroup	1516.440	1	1516.440	42.492	.000	.480
Age	162.314	1	162.314	4.548	.038	.090
Gender	93.278	1	93.278	2.614	.113	.054
trtgroup * age	120.034	1	120.034	3.363	.073	.068
trtgroup * gender	172.839	1	172.839	4.843	.033	.095
age * gender	71.827	1	71.827	2.013	.163	.042
trtgroup * age * gender	57.571	1	57.571	1.613	.210	.034
Error	1641.624	46	35.687			
Total	70849.000	55				
Corrected Total	4032.836	54				

a. R Squared = .593 (Adjusted R Squared = .522)

Results presented in Table 1 indicate that there is a significant main effect of treatments in the management of computer anxiety ($F_{(1,46)}$= 42.492, $p<0.05$,ñ =0.480). Based on this, the null hypothesis is rejected. In conclusion, there is a significant main effect of treatment in reducing computer anxiety among participants. To further provide information on the management of computer anxiety among the two groups (CBT and Control), Multiple Classification Analysis (MCA) was computed, and the result is shown in Table 2.

Table2: Post-Hoc Multiple Classification Analysis

treatment group	Mean	Std. Error	95% Confidence Interval Lower Bound	Upper Bound
CBT	27.260[a]	1.418	24.405	30.115
Control	39.733[a]	1.211	37.295	42.171

From the MCA Table, it is evident that the cognitive behaviour therapy (CBT) group had the least adjusted post-test mean score (=27.260); the control group had the high adjusted mean score (= 39.733). The direction of the increasing effect of the interactions in the management of computer anxiety is CBT>Control. Table 2 indicates that the independent variables jointly accounted for as much as 52.2% (MR^2=0.522) of the variance in the management of computer anxiety among the participants, while the remaining 47.8% is due to pre-test measures or other unexpected sampling errors. The result of this study indicates a significant main effect of treatment on the computer anxiety of participants. The implication is that cognitive behaviour therapy was effective in the management of the computer anxiety of participants. In other words, if computer-anxious individuals are exposed to cognitive behaviour therapy, they could be helped to develop skills that will help effectively deal with their phobic condition. This finding is in line with Rosen, Sear and Weil (1993), who found cognitive behavioural therapy effective in treating students with computerphobia. This finding is also consistent with Brosnan and Thorpe (2006), who established that cognitive behaviour therapy effectively reduced anxiety among computer-anxious participants. Similarly, studies

(Brozovichet al., 2015; Ebert et al., 2015; Gould et al., 1997; Douglas et al., 2003; Linden et al., 2005) have also confirmed that cognitive behaviour therapy was very helpful in improving symptoms in people with anxiety. Additionally, the study's finding is also in congruence with that of Fathi-Ashtiani, Salimi and Emamghohivand (2006), who found that cognitive therapy was effective in test anxiety among high school students.

Hypothesis Two: There is no significant main effect of age in the management of computer anxiety among the participants.

The result of the analysis, as presented in Table 1, indicates that age significantly influenced computer anxiety among participants exposed to treatment (CBT and control group) ($F_{(2,123)}$=4.548, $p<0.05$, $\tilde{\eta}$=0.090). This suggests that age significantly affects participants' anxiety when using computers. Thus, the null hypothesis is rejected. To further provide information on computer anxiety management between the two levels (young and old), the t-test was computed. The result indicated that the young students had a high adjusted post-test mean score (=35.59) while the old students had an adjusted mean score (= 31.40).In the treatment of computer anxiety, interaction has a greater positive effect on young students than on older students.

Table3: Post-Hoc Multiple Classification Analysis

			95% Confidence Interval	
Age	Mean	Std. Error	Lower Bound	Upper Bound
16 - 29yrs	35.593[a]	1.109	33.360	37.827
30+yrs	31.399[a]	1.533	28.312	34.486

The finding of this study correlates with studies from other scholars (Rahimi &Yadollahi, 2011; Czaja&Sharit, 1998; Czaja et al., 2006; Oluwole, 2009) who found a significant relationship between age and levels of computer anxiety. However, it is different from Reed et al. (2005) who concluded that age had no impact on computer anxiety. A plausible reason for this difference could be that NOUN's older first-year students were more mature and responsible for the financial and material resources needed for their

study. It could also be that they took the intervention programme more seriously than the younger first-year students. This argument is based on the belief that older first-year students have more desire to complete their programme for one reason or the other (especially career advancement) and would appreciate any intervention that could help in realising their dreams.

Hypothesis Three: There is no significant main effect of age in the management of computer anxiety among the participants.

As can be seen in Table 1, the analysis indicates that there was no main effect of gender on post-test scores of male and female participants treated with CBT and the control group ($F_{(1,46)}=2.614$, $p>0.05$, $\tilde{\eta}=0.054$). This suggests that there is no significant main effect of gender in managing computer anxiety among participants. Therefore, the null hypothesis is now retained. The finding could be attributed to the fact that computer anxiety is a psychological imbalance that affects individuals irrespective of gender. This result agrees with other studies (Howard & Smith, 1986; Igbaria&Parasuraman, 1989)which found no significant gender correlation in computer phobia among business professionals and managers. The findings also correlate with Tunceret al. (2013), Chao (2001), Sam et al. (2005), Adebowaleet al. (2009) and Karsten and Roth (1998). The finding of the current study contradicts that of other studies such as Yoon et al. (2016), Schumacher and Morahan-Martin (2001), Halder and Chaudhuri (2011) and Sanalan (2016)who found gender variations in students' computer anxiety. For instance, Halder and Chaudhuri (2011) conducted a study involving secondary school teacher trainees. They found significant gender differences in computer anxiety, where male trainees had more computer anxiety than females. Sanalan (2016) investigated computer phobia among Turkish university pre-service teachers. Sanalan's findings indicated that females were significantly more fearful of computers than their male counterparts.

Recommendations

Fresh students in Open and Distance Learning (ODL) institutions face many challenges, of which computer anxiety is prominent. Many of these learners find the use of the computer as a tool or resource for their studies

as against their orientation from their previous schools. Based on these findings, the following recommendations are given.

1. Cognitive behaviour therapy (CBT) should be incorporated into the orientation programme of fresh students in NOUN.CBT should be an integral component of the orientation programme, anchored by qualified personnel. This kind of training at the inception/resumption of study is critical as it would equip learners with skills needed to cope in the ODL environment.
2. Newly admitted NOUN students must be assessed for their computer anxiety or attitude. Computer-averse students should be offered computer skills enhancing and phobia-reducing interventions within weeks of resumption.
3. Students' counsellors should be well equipped with skills in CBT and should be compelled to use CBT in managing computer anxiety among NOUN students to diffuse their anxiety.
4. Counsellors, ICT personnel and other NOUN staff should encourage computer-anxious learners, noting that their students are at different levels of computer literacy and competence.
5. Computer-anxious learners should avail themselves of CBT since the strategy was efficacious in managing computer anxiety.
6. NOUN Study Centres should all have computer centres to facilitate hands-on activities with computers and allow learners to observe others using computers freely since many do not possess computers of their own.
7. Psychologists and educators should use CBT to reduce computer anxiety among distance learners.

Conclusion

Based on the findings of this study, the following conclusions were made. Cognitive behaviour therapy was effective in the management of computer anxiety among NOUN freshmen. It is expected that the proper application of this intervention programme should yield similar results in future. Age had a significant effect on the management of computer anxiety among NOUN freshmen while gender did not.

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