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Full Length Research

Influence of academic control and academic stress on online test anxiety: A structural equation modelling study

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ABSTRACT: This study focuses on the influence of academic control and academic stress on online test anxiety using structural equation modelling approach. Two hypotheses guided the study. The data for the study was collected from one thousand secondary school students (540 females and 460 males) using purposive sampling techniques in Ughelli North Local Government Area of Delta State, Nigeria. CFA revealed that the three factors conformed well to the structure of the model and fitted to the data, with indices of CFI = 0.952, AGFI = 0.878, RMSEA = 0.051; and a statistically significant chi-square $\chi 2/df = 1.758$. In the structural model, the three factors conformed well to the structure of the model and fitted to the data, with indices of CFI = 0.932, AGFI = 0.888, RMSEA = 0.059; and a statistically significant chi-square $\chi 2/df = 1.838$. The results of the study also indicated that academic self-control and academic stress have significant influence on online testing anxiety. The researcher recommended that the school principals should organize workshops and seminars for students on how to control online test anxiety.

Keywords: Academic control, academic stress, anxiety, online learning, test.

INTRODUCTION

Online learning encompasses a range of technologies such as the worldwide web, email, chat, new groups and texts, audio and video conferencing delivered over computer networks to impart education. It helps the learner to learn at their own pace, according to their own convenience. Online education requires a great deal of resources and careful planning. In this, teachers act as facilitators rather than transmitters of content knowledge, and ICT is regarded as resource that enhances the learning experience of students. Learners learn through e-learning tools which are available to all. E-learning has brought back the joy in learning through its innovative and interactive content delivery and has proved to be more appealing among students. Online learning provides accessibility due to which a student can learn from anywhere in the world (Dhull and Sakshi, 2019). This is an especially important consideration for students who wish to study in a different country. It does not matter where a student lives and what he wants to study- he can always find a suitable course or even a degree program that can be followed from home. Online learning has become the largest sector of distance learning in recent years (Bartley and Golek, 2004; Evans and Haase, 2001). Helms (2014) reported that students miss more online assessment opportunities and assignment compared to face-face mode of assessment, get significantly lower grades, and typically fail the examination often. According to Robotham (2008), online platforms for online education demands strong support and relevant studies to make it more effective and improve the quality of online education. Similarly, the study of Cassady and Gridley (2005), which also compared students who took their examination using paper and pencil and those online found that students who took their examination online reported lower level of perceived test anxiety.

Online testing anxiety

Online test anxiety research has prospered, in part, due to

the increasing personal salience of test situations for people in modern society, making tests and their long-term consequences significant educational, social, and clinical problems for many. Indeed, online test anxiety figures prominently as one of the key villains in the on-going drama surrounding psycho-educational testing, as a source of both scholastic underachievement and psychological distress (Moshe and Gerald, 2017). Many students have the ability to do well on exams, but perform poorly because of their debilitating levels of anxiety during online assessment (Rana and Mahmood, 2010). Test anxiety may also jeopardize assessment validity in the cognitive domain and constitute a major source of 'test bias' in that anxious examinees may perform less well than their ability and skills would otherwise allow. Much of the online test anxiety research over the past half century has been conducted to help shed light on the negative effects of online test anxiety on examinee performance and these concerns have stimulated the development of a variety of assessment methods, to which we now turn. Schult and Mcintosh (2004) compared the anxiety of students in psychology classes who knew they would take online test to students in other sections who expected paper test. They also found out that students who exposed to online test have higher level of test anxiety to those who are expected to paper test. Online test provides a way for high test anxious students to escape classroom cues that have been conditioned to elicit test anxiety in the past (Stowell and Bannett, 2010). Similarly, the study of Cassady and Gridley (2005), which also compared students who took their examination using paper and pencil and those online found that students who took their examination online reported lower level of perceived test anxiety. Many factors contribute to the development of online test anxiety, some of which include fear of failure, procrastination, poor study habits and lack of confidence in one's ability (Balogun et al. 2017).

Academic control

Academic control describes differences between students in their perceptions about their capacity to influence and predict outcomes and events in achievement settings. In judging one's capacity to influence an event, a student assesses whether a certain attribute will produce a specified achievement outcome and whether he/she possesses that attribute. Although academic control has important consequences for how well students adjust to college, it is likely not the sole factor contributing to the paradox of failure. Perceived academic control has been found to be an important predictor of academic success in terms of (a) low dropout intention and (b) high achievement (Perry et al., 2005). Perceived academic control is often described as the subjective perception of individual influence; in other words, being in control (Skinner,1996). Perceived academic control, the domain specific variant of perceived control, is a person's belief in his or her influence over the success or failure of achievement outcomes. Perry et al. (2001) found that, relative to high-control students, low-control students obtained worse grades in a two-semester course, reported having lower motivation and exerting less effort, felt more bored and anxious, used self-monitoring strategies less often, and had less control over course assignments and life in general. However, an interaction between academic control (low, high) and preoccupation with failure (low, high) showed that high-control students out per-formed in the other three groups of students, but only if they were also high in failure-preoccupation. Stupnisky et al. (2012) found perceived academic control to be unstable for some individuals and that this instability can have important consequences for their academic achievement. Respondek et al., (2017) reported that perceived academic control is positively linked to several relevant factors, which underlines its importance for undergraduate students' academic success. Moreover, perceived academic control has a higher impact on academic success than self-esteem (Stupnisky et al., 2007).

Academic stress

Stress is viewed as a negative emotional, cognitive, behavioural and physiological process that occurs as a person tries to adjust to or deal with stressors (Bernstein et al., 2008). Academic stress, according to Prabu (2015), is the anxiety and stress that comes from schooling and education. There is often a lot of pressure that comes along with pursuing a degree and one's education. There is studying, homework, tests, labs, reading, and quizzes. There is the stress of doing all of the work, balancing the time and finding time for extra-curricular activities. Academic stress is especially hard on school students who are often living away from home for the first time. Teachers expect work to be completed on time. Students may underestimate the amount of time it takes to complete reading and writing assignments, to print out copies of their work. Similarly, students reports the greatest sources of academic stress arise because of examinations and because of grade competition and large amount of content to master within limited time (Heralth, 2019). Other factors that contribute to academic stress include environment, information overload, high competitiveness, unrealistic ambitions, high expectations; limited opportunities and academic pressure are sources of academic stress in students (Sinha et al., 2001). Furthermore, change in sleeping habits, vacation and breaks, change in eating habits, increased work load, and new responsibilities. Elevated stress levels among students can result in a decreased performance in the academic accomplishments and can affect both the physical and mental health of students. Stress is central concept for understanding both life and evolution (Aafreen et al., 2018). Learning and

memory can be affected by stress. Too much stress can cause physical and mental health problems, reduce self-esteem and may affect the academic achievement of students (Rafidah et al., 2009). Stress and its manifestations, such as anxiety, depression, and burnout, have always been seen as a common problem among people in different professions and occupations (Onyeizugbo, 2010). Academic stress among students have long been researched on, and researchers have identified stressors as too many assignments, competitions with other students, failures and poor relationships with other students or lecturers (Fairbrother and Warn, 2003). Academic stressors include the student's perception of the extensive knowledge base required and the perception of an inadequate time to develop it. Literature review indicates that there is need to build a complex framework to explain how influence of academic control and academic stress on online test anxiety. From the above review, the researcher hypothesized that:

H_{o1}: Academic control is positively related to test anxiety for online learning.
H_{o2}: Academic stress is positively related to test anxiety for online learning.

METHODOLOGY

The population of the study was made up of 13,267 SS 2 secondary school students in Ugheli North Local Government Area of Delta State, Nigeria (Ughelli North Local Education Authority, 2020). The data for the present study were collected from two hundred and fifty secondary school students (560 females and 460 males) in Ughelli North Local Government Area of Delta State which was obtained from thirty secondary schools using purposive sampling techniques. A purposive sampling technique was adopted for easy access to the research participants.

Measures of academic control

Academic self-control scale developed by Büyük et al. (2020) was used. The ASCS consists of 12 items in two subscales based on a 5-point Likert-type response format, rated from “never” to “always”. There are reverse coded items on scale, and the total score obtainable from the scale ranges from 12 to 60. A higher score received from the scale shows higher academic self-control. As a result of the Principal Component Analysis (PCA) conducted to evaluate the construct validity of the Academic Self-Control Scale (ASCS), two factors named "academic perseverance" and "academic attention" were determined. These factors explained 47.11% of the variance in the participants’ academic self-control scores. Additionally, Confirmatory Factor Analysis (CFA) results confirmed the suitability of the factor structure. The Academic Perseverance Scale was used for criterion validity, and a positive correlation (0.74) was found. The internal consistency reliability measured using Cronbach Alpha was found to be 0.81. The test-retest reliability result was 0.93. These findings indicate that the ASCS could be used to assess academic self-control of secondary school students. For this study, the Cronbach Alpha was found to be 0.89.

Measure of academic stress

The Educational Stress Scale for Adolescents (ESSA) developed by Sun et al. (2011) was used. The final 16-item ESSA contains five latent variables: Pressure from study, workload, worry about grades, self-expectation, and despondency, which together explain 64% of the total item variance. Scale scores showed adequate internal consistency, 2-week test–retest reliability, and satisfactory concurrent validity. A confirmatory factor analysis suggested the proposed factor model fits well in a different sample. The response format used a 5-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree with a higher score indicating greater stress. After carefully examining the meaning, these factors were labelled as pressure from study, workload, worry about grades, self-expectation, and despondency (Table 1). On the basis of the data from the first survey (N = 347), the Cronbach’s alpha for the total 16-item ESSA was 0.81 indicating good internal consistency. The coefficient alpha for each factor ranged from 0.66 to 0.75. For this study, the Cronbach Alpha was found to be 0.79.

Online test anxiety

Online test anxiety inventory developed by Alibak et al. (2019) was used. The results of exploratory factor analysis provided an 18-item scale OTAI, a psychological component with six items with high internal consistency (α = 0.90); physiological component with five items with an acceptable internal consistency (α = 0.84); and online component with seven items with high internal consistency (α = 0.89). Confirmatory Factor Analysis (CFA) recognized an adequate fit of the 18-item OTAI. CFA revealed that the three factors conformed well to the structure of the model and fitted to the data, with indices of CFI = 0.942, AGFI = 0.828, RMSEA = 0.069; and a statistically significant chi-square $\chi 2/df = 1.738$. The final result is a multidimensional, 18-item OTAI comprised of three factors— online, psychological, and physiological—with overall high internal consistency (α = 0.91). For this study, the Cronbach Alpha was found to be 0.81.

RESULTS

Descriptive statistics and bivariate correlations

Means and standard derivations for all the variables and their bivariate correlations were calculated in line with pertinent programs in R programing Language. Eighteen

Table 1. Descriptive statistics.

Variables	Mean	SD	Skew	Kurtosis
AC	0.07	2.8	0.08	0.01
PE	0.03	2.52	0.01	0.07
PS	0.09	2.41	-0.03	-0.16
PH	0.03	2.23	0.00	0.40
ON	0.04	2.05	0.01	0.05
P	0.05	1.15	-0.07	0.07
WL	0.02	1.23	-0.07	0.03
WG	0.03	1.37	-0.08	0.08
SE	0.05	1.32	0.03	0.21

Table 2. Correlation of variables.

	AC	PE	PS	PH	ON	P	WL	WG	SE
AC	1.00								
PE	0.37	1.00							
PS	0.09	0.14	1.00						
PH	0.08	0.09	0.82	1.00					
ON	0.09	0.12	0.78	0.76	1.00				
P	0.05	0.01	0.15	0.16	0.14	1.00			
WL	-0.01	0.01	0.19	0.17	0.16	0.27	1.00		
WG	0.05	0.05	0.23	0.22	0.21	0.32	0.38	1.00	
SE	-0.02	-0.01	0.18	0.17	0.20	0.27	0.33	0.41	1.00

participants who did not complete all the questionnaire were removed from the dataset. The 982 of the 1000 cases with intact data were kept for all the analyses performed in this study.

Table 1 show the descriptive statistics of the observed variables in the study. The table show that the mean of the observed variables ranges from 0.02 to 0.09, while standard deviation range from 1.15 to 2.80. Skweness range from -0.08 to 0.08 while Kurtosis range from -0.16 to 0.40. The kurtosis and skweness are within the range -2 to +2 as recommended values (Field, 2017). Hence the data were normally distributed. As Table 2 shows, the observed variables have a correlation range from -0.01 to 0.76. The implications is that there is no multiconlinearity among the variables Academic Persevrance (Ac), Academic attention (coded as PE), Psychology (PS), Physiology (PH), Online (ON), Pressure (P), Workload (WL), Worry about Grade (WG) and Self-expectation (SE).

Measurement model

CFA revealed that the three factors conformed well to the structure of the model and fitted to the data, with indices of CFI = 0.952, AGFI = 0.878, RMSEA = 0.051; and a statistically significant chi-square $\chi 2/df = 1.758$. As Table 2 shows, the measurement model, both academic perseverance (AC) and academic attention (PE) significantly loaded on the latent variable of academic self-control, ß = 0.514 and ß = 0.720 ($p<0.001$) for academic perseverance (AC) and academic attention (PE, respectively. The latent variable explained about 26.4 and 51.8% of the variances of these two observed variables, respectively. Table 3 indicates that the three measures of online testing anxiety (OTA) also loaded significantly on the latent variable, ß = 0.98, ß = 0.894 and ß = 0.885 ($p = 0.000$) for psychology (PS), Physiology (PH) and Online (ON), respectively. The latent variable accounted for about 96, 79.6 and 78.3% of the variance in these two indicators, respectively. For Academic Stress (AS), despondency was removed as observed variable due to poor loading, the remaining three observed variables of academic stress (AS) also loaded significantly on the latent variable, ß = 0.467 for pressure (P), ß = 0.551, $p<0.001$ for workload (WL), and ß = 0.688, $p<0.001$ for worry about grade (WG), and ß = 0.587, $p<0.001$ for self-expectation (SE). The latent variable accounted for about 21.8, 30.4, 47.3, and 34.4% of the variance in these four indicators, respectively.

Structural model

In the structural model, the three factors conformed well to the structure of the model and fitted to the data, with indices of CFI = 0.932, AGFI = 0.888, RMSEA = 0.059; and a statistically significant chi-square $\chi 2/df = 1.838$. Table 4 shows that the latent variables academic self-

Table 3. Factor loadings of observed Variables on latent variable.

Variables	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std. all
ASC =~						
AC	1.000				1.436	0.514
PE	1.261	0.430	2.931	0.003	1.811	0.720
OTA =~						
PS	1.000				2.214	0.918
PH	0.899	0.022	41.117	0.000	1.990	0.894
ON	0.790	0.021	38.039	0.000	1.749	0.854
AS =~						
P	1.000				0.536	0.467
WL	1.293	0.125	10.324	0.000	0.692	0.561
WG	1.762	0.162	10.885	0.000	0.944	0.688
SE	1.441	0.137	10.511	0.000	0.772	0.587

Table 4. Influence of academic stress and control on online test anxiety.

Regressions	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std. all
ASC	0.263	0.070	3.780	0.000	0.171	0.171
AS	1.430	0.190	7.532	0.000	0.346	0.346

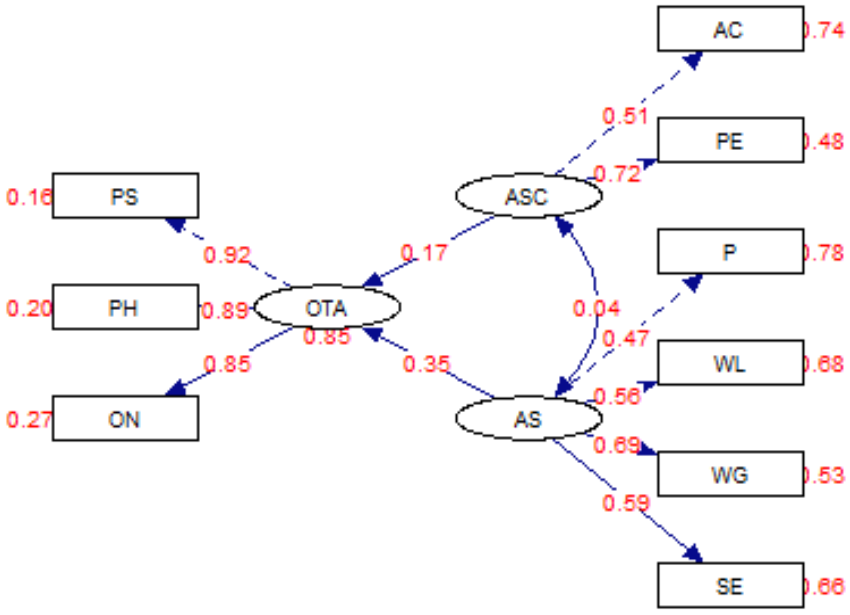

Figure 1. Path diagram of the influence of academic stress and academic control on online testing anxiety.

control is predictive of online testing anxiety (OTA), after accounting for the effect of academic stress (AS), ß = 0.171, p = 0.000. However, after accounting for the effect of academic self-control, academic stress did show significant unique contribution to online testing anxiety (OTA), ß = 0.346, p = 0.00. Figure 1 indicates that academic control and academic stress are substantial contributors to test anxiety for online learning.

DISCUSSION

The finding of the study indicates that there is a significant relationship between academic stress and online testing anxiety. Furthermore, the study also indicates that academic stress is a significant predictor of online testing anxiety. This is possibly due to the fact that stress can trigger anxiety during testing. Academic stress among students have long been researched on, and researchers have identified stressors as too many assignments, competitions with other students, failures and poor relationships with other students or lecturers (Fairbrother and Warn, 2003). Academic stressors include the student's perception of the extensive knowledge base required and the perception of an inadequate time to develop it (Rafidah et al., 2009). Too much stress can cause physical and mental health problems, reduce self-esteem and may affect the academic achievement of students.

The finding of the study indicates that there is a significant relationship between academic self-control and online testing anxiety. Furthermore, the study also indicates that academic self-control is a significant predictor of online testing anxiety. This may be due to the fact that when a student has academic self-control it can reduce anxiety in testing situation. A bright student who has high academic control, but who allocates insufficient cognitive resources to setting academic goals, to enacting strategies and plans to attain them, and to monitoring success and failure, may not perform optimally in a course. Consequently, talented high school students can underperform at college, either because of their lack of academic control, or because of failure to monitor and modify their efforts, or both. Academic control as a relatively stable psychological disposition affecting students' scholastic performance resulting from class tests, term assignments, and course grades, while recognizing its transient, state qualities as well. This agreed with the findings of Schult and Mcintosh (2004) who compared the anxiety of students in psychology classes who knew they would take online test to students in other sections who expected paper test. They also found out that students who exposed to online test have higher level of test anxiety to those who are expected to paper test. It was presumed to reflect students' beliefs both about various factors responsible for their academic successes (cause—effect relationships) and about whether they possess those factors as personal attributes, such as intellectual aptitude, physical stamina, effort expenditure, task strategies, social skills, and educational experience (Sinha et al., 2001).

Conclusion

The researcher concludes that academic control and academic stress are substantial contributors to online test anxiety. Academic control is positively linked to online test anxiety, which underlines its importance for undergraduate students' academic success. Moreover, academic stress has impact on online test anxiety.

Limitations of the study

The study was based on purposive sampling techniques, this no doubt could affect the generalizability of the findings of the result. Similarly, the results of the study were not compared across gender to find out if there is measurement invariance.

Recommendations

The researcher recommends that school management that involve in online assessment should organize workshops and seminars for students on how to control online test anxiety during examinations. Controlling online test anxiety will help to improve students' online academic achievement. Furthermore, students should develop high level of academic control and also indulge in less stressful activities as this can influence their online test anxiety.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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