

Stress Characteristics and Cheating Tendencies Among Primary Learners in Calabar South Nigeria



Maureen Okang Okon¹

¹Department of Educational Foundations University of Calabar, Calabar

ABSTRACT

The study investigated the relationship between stress characteristics (academic, financial and personal social) and cheating tendencies among primary school learners. The survey design was adopted for the study. The stratified random sampling technique was used in selecting 300 pupils for the study. Two null hypotheses were formulated to guide the study. A survey instrument called SCACTQ with thirty-two (32) items duly validated was used for data collection. Data was analyzed using Pearson product moment correlation analysis for hypothesis 1 and independent test for hypothesis 2. Result of data analysis revealed significant relationship between stress (academic, financial personal social) and cheating tendencies of pupils. Result also suggested that sex difference influences stress and cheating tendencies of pupils.

Keywords: Stress characteristics, Cheating tendencies, Primary learners, Calabar-South

DOI: 10.20448/804.1.1.53.61

Citation | Maureen Okang Okon (2016). Stress Characteristics and Cheating Tendencies among Primary Learners in Calabar South Nigeria. American Journal of Education and Learning, 1(1): 53-61.

Copyright: This work is licensed under a [Creative Commons Attribution 3.0 License](https://creativecommons.org/licenses/by/3.0/)

Funding : This study received no specific financial support.

Competing Interests: The authors declare that there are no conflict of interests regarding the publication of this paper.

History : **Received:** 7 June 2016/ **Revised:** 21 June 2016/ **Accepted:** 27 June 2016/ **Published:** 30 June 2016

Publisher: Online Science Publishing

1. INTRODUCTION

The falling standard of education in Nigeria, and its debilitating effect on the nation's development have become a source of great worry and concern to the Nigerian nation. Indeed today, the pollution of our education sector by the students and other stakeholders in education have been discussed at different forums by parents, teachers, counselors, administrators, policy makers and other well-meaning Nigerians (Animasahun & Ogunniran, 2015; Okon & Petters, 2015). Yet, the educational system has become more and more abused to the extent that parents, teachers and the students in particular no longer respect academic integrity. Hence indulge deeply in different forms of cheating behaviours. This has somehow led to the growing apathy among teachers and other stakeholders concerning measures to take in controlling the cheating behaviours of students. Hence, teachers, school administrators, and even professors look the other way when faced with problems of cheating. The prevalence of cheating behaviours among learners has been established. This phenomena has been on the increase (Akanni & Odofin, 2015) and has been deeply entrenched in the Nigerian educational system for over two decades now (Udoh, 2013), and has currently assumed an epidemic proportion. Cheating refers to actions that violate the established rules and regulations

of an academic institution with regards to a wide range of activities which relate to assessment of students on academic tasks. It enables one student to have an unfair advantage over others on a test or assignment. It also decreases the accuracy of the intended deductions that would arise from students' performance on a test or assignment. Examination leakage, impersonation, encoding/decoding, swooping of answer scripts during examination, or after doing assignments for others, copying answers from the chalkboard and so on, are the various forms of cheating behaviours expressed by students in our schools. Any action taken either by the student or examiner or by any official assigned with administration, evaluation or measuring the examination result constitutes malpractice or cheating.

Cheating is counter-productive hence militates against the optimal unfolding of an individual's potentials. It also reduces the validity of assessment results (Athanasou & Olasehinde, 2002). The consequence of this is the production of underdeveloped, ill-prepared graduates from primary schools who lack readiness for secondary education. Piaget's theory suggests that cognitive development occurs in stages, one stage preceding the other (Iheanacho, 2002). An individual therefore progresses from a lower level of cognition to a higher level. Failure to be effectively grounded in the activities of an earlier stage of cognition will create gaps that will not allow efficiency in the cognitive development of an individual later. An individual's readiness for progressing to the next level of cognition is usually ascertained through assessment. Hence, the case whereby learners fail to show scholarship by writing examination/other assessment through their efforts, rather resorting to cheating, readiness for advancement to the next level of reasoning cannot be guaranteed. Cheating in examination affects many aspects of teaching, learning and assessment and can disadvantage honest students. Athanasou & Olasehinde, (2002). Unfortunately, cheating cuts across all levels of education in Nigeria. The menace of cheating in examination cannot therefore be over-looked. However, efforts made by government, school administrators, educational psychologists, guidance counsellors, non-governmental organizations and so on to curb the menace have not yielded significant results. Research in the area have revealed a relationship between undue emphasis on high grades in test scores, emphasis on paper qualification, fear of failure, inadequate preparation and cheating in examination and other forms of assessment. Cheating tendencies have also been blamed on other personal, social and psychological factors such as students work load, students stress, teacher attitudes, ineffective deterrents, an increasing lack of integrity among students, teachers and others concerned with the teaching-learning process, attitude towards cheating as well as extrinsic motivation (Anderman, Griesingers & Westerfield, 1998).

Schooling is stressful. Hence everyday stressors from the school and home environment could influence students' adjustment, emotional state and cognitive outcome (Kenny, Gallagher, Alvarez-Salvat, Silsby, 2002; Kaplan, Liu & Kaplan, 2005). Stress is a negative emotional experience accompanied by predictable biochemical, physiological, cognitive and behavioural changes that are directed either towards altering the stressful event or accommodating its effects (Taylor, 1999). It produces psychological symptoms such as feelings of anxiety, depression, memory problems, aggression, restlessness, frustration, learned helplessness and so on. These in turn may give rise to an individual's inability to do work effectively and to achieve anything desirable. Sulaiman, Hassan, Sopian and Abdullah (2009) have identified stressors that affect our everyday lives to include problems at school, finances, and family problems as well as problems in an individual's environment. Stress is problematic, it saps one's energy and its effect may persist for a long time and do

cumulative damage to an individual's perceptual and cognitive abilities. Warning signs of stress such as memory problem, inability to concentrate, feeling overwhelmed, sleeping too little, have been noted to adversely affect academic output of students (Smith, Segal & Segal, 2011). These signs of stress may lead the students to become agitated, and anxious when faced with examination and likely to indulge in some form of academic dishonesty in order to achieve their school goals. Considering therefore the fact that cheating is counter-productive and occurs even among learners at the formative stage of development (i.e. primary school), that stress is inevitable in the school system and that severe stress carries consequences that militate against optimum performance, it becomes expedient to carry out this present study to ascertain the relationship between different dimensions of stress (viz a viz economic, emotional, physical and social stress and physical stress) and cheating tendencies among primary learners in public schools in Calabar South, Cross River State of Nigeria.

2. LITERATURE REVIEW

Literature in the area under study reveals a relationship between stress related factors and academic performance. Example, an association between lack of time to study (Baird, 1980; Newstead, Franklyn-Stokes & Armstead, 1996) the need to earn good grades (SinghaL, 1982; Newstead, et-al. 1996) as well as the need to belong and the cheating behaviours of students have been established.

Assessing sources of cheating behaviours, Baird (1980) found that 35 percent of students studied, attributed their cheating behaviours to inability to cope with workload, while SinghaL (1982) found that 68 percent of students cheated in order to obtain good grades. The need to obtain better grades and lack of time were implicated in the study carried out by Newstead, et. al (1996). In a review by Davy, Kincaid, Smith & Trawick, (2007) extrinsic motivation was found to be associated with cheating tendencies. More explicitly, Baker (2004) pointed out that intrinsic motivation contributes positively to learning while extrinsic motivation impairs learning thereby resulting in poor performance and an increased need to cheat. Studying cheating and academic efficacy, Murdock, Hale and Weber (2001) found that cheating has an inverse relationship with academic efficacy. This implies that cheating impairs academic efficacy. An impaired academic efficacy would affect academic performance hence a student who lacks academic efficacy but anxious to pass an examination would likely indulge in cheating. Consequently, Murdock, Miller and Goetzinger (2007) opined that situational factors such as stress are paramount in the explanation of cheating behaviours. In another review, Whitley and Keitherspiegel (2002) attributed cheating to poor scholastic attitude and poor academic preparation. In fact, when people are stressed, they exhibit negative attitudes and a lack of capacity for good academic preparation which makes them susceptible to cheat in an examination situation. In another study, emphasis on paper qualification, fear of failure and inadequate preparation for examination was found to influence examination malpractice (Emaiku, 2012). The researcher assessed through survey the impact of examination on measurement of ability using 300 students and 100 lecturers in Nigeria. Result of data analysis revealed gross malpractice by students and lecturers in Nigerian universities. The efficacy of examination in measuring students' ability and performance as was noted by the researcher was therefore put in doubt. Cheating in examination is a criminal offence which could attract stiff penalties and appears to be associated more with males than females, (Omonijo & Nnedum, 2012).

Rotimi, Omonijo and Uche (2014) examined through correlational survey the influence of personality types and socio demographic characteristics of students on examination malpractice among secondary school students in Ibadan, Nigeria. 300 respondents selected through multistage sampling technique were used for the study. The research instrument was questionnaire with reliability index of 0.71. Data collected was analyzed using independent t-test. Result of data analysis revealed among other things a significant gender relationship with female students showing more proneness to examination malpractice than males. This result was at variance with the work done by Bjorklund and Wenestam (1999) that found and observed that although males and females indulge in cheating, they differ significantly in their cheating behaviour involving taking unauthorized materials into examination. In line with this Anderman and Danner (2008) also observed small but significant sex differences in academic cheating with the males more involved. Hensley, Kirkpatrick and Burgoon (2013) in their study of public university undergraduates also found that male students in a study strategies course had a significantly higher report rate for both plagiarism and making false excuse as compared to females students in science. In another vain, D' Archy & Ingrid (2007) found sex differences in students ethics. More males than females endorsed academic integrity suggesting that females in the study were more inclined to cheating than males.

Literature on sex differences in stress and cheating behaviour as a whole is limited. Although stress and stress related factors have been indicted in earlier research (Sulaiman, et. al., 2009), none of the studies reviewed categorized stress as has been done in the study. The present study attempted to look at the different dimensions of stress to ascertain how the dimensions relate to the academic cheating tendencies and to examine the influence of sex differences in cheating tendencies among primary learners.

2.1. Hypothesis

The study was guided by the following hypothesis

1. There is no significant relationship between pupils stress (academic, financial and personal social) and cheating tendencies.
2. There is no significant gender influence on pupils stress and cheating tendency.

3. METHODOLOGY

Participants: This study used sample drawn from public primary schools in Calabar South Local Government Area, Calabar South. A total of 300 respondents (n=300) made up of 141 males and 159 females were randomly selected from primaries 5 and 6 using the proportionate simple random sampling technique.

3.1. Instrumentation

The study adopted a single research questionnaire titled stress characteristics and academic cheating tendencies questionnaire (SCACTQ) in generating data for the study. The instrument had two sections A and B. Section A elicited information on the respondents personal data. Section B was a four point scale that required respondents to state their degree of agreement ranging from Strongly Agree (SA), Agree (A), Disagree (D) to strongly disagree (SD), to the statements relating to the variables under study. The instrument had a total of thirty two (32) items; items 1-8 e.g. I find it difficult getting to school in time; I have problems

meeting up with assignment deadlines, measured academic stress; items 9-13 e.g. I do not have the money to pay for my basic school needs; I bear the burden of my financial needs; I am often under pressure because of many school demands that involve money, measured students financial stress; items 14-21 e.g. I have trouble getting along with family members; I feel sad and lonely most of the time; I easily get into a fight with others measured social stress; items 22-32 e.g., it is okay to see examination questions before hand; using money to sort for a high grade is okay; it is wrong to copy in examination, measured cheating tendencies.

Data collected was collated and subjected to analysis using Pearson product moment correlation analysis for hypothesis 1 and independent t-test for hypothesis 2.

3.2. Result

The result of data analysis is presented as follows:

3.3. Hypothesis one

The hypothesis stated that there is no significant relationship between pupils stress (in terms of academic, financial and personal social stress) and their cheating tendency in examination. The independent variable in hypothesis one is stress with three dimensions (academic, financial and personal social) while the dependent variable is cheating tendency. To test this hypothesis, pupil scores on cheating tendency were correlated with their scores on stress. Pearson Product Moment Correlation Analysis was employed to test this hypothesis. The result of the analysis is presented in Table 1.

Table-1. Pearson product moment correlation analysis of the relationship between pupils stress and their cheating tendency (N=300)

Variable	$\sum X \sum Y$	$\sum X^2 \sum Y^2$	$\sum XY$	r-value
Academic stress x_1	5109	8634	138943	0.71*
Financial stress x_2	5289	8746	138955	0.65*
Personal – social stress x_3	5403	8962	139223	0.61*
Cheating tendency y	4939	6546		

* Significant at .05 level, critical $r = .113$, $df = 298$

The result in Table 1 reveals that the calculated r-values for academic stress ($X_1=0.71$), financial stress ($x_2=0.65$) and personal social stress ($X_3=0.61$) are respectively higher than the critical r-value of .113 at .05 level of significance with 298 degrees of freedom. With this result the null hypothesis was rejected. This result implies that academic stress, financial stress and personal – social stress significantly relate with pupils cheating tendency in examination.

3.4. Hypothesis Two

There is no significant influence of gender on pupils stress and cheating tendency. The independent variable in this hypothesis is gender (male and female) while the dependent variable is stress and cheating tendency. To test this hypothesis stress and cheating tendencies of male and female pupils were compared using independent t-test analysis. The result of the analysis is presented in Table 2.

Table-2. Independent t-test analysis of the influence of gender on pupils stress and cheating tendency (N=300)

	Gender	N	\bar{x}	SD	t-value
Academic stress	Male	141	19.80	2.14	11.20*
	Female	159	17.08	2.06	
Financial stress	Male	141	18.25	2.01	7.26*
	Female	159	16.57	1.99	
Personal social stress	Male	141	18.89	2.09	5.07*
	Female	159	17.78	2.12	
Cheating tendency	Male	141	29.61	2.64	7.52*
	Female	159	27.44	2.32	

* Significant at .05 level, critical $t=1.96$, $df = 298$

The result in Table 2 indicates that the calculated t-values for male and female students on academic stress (11.20) financial stress (7.26), personal – social stress (5.07) and cheating tendency (7.52) are respectively higher than the critical t-value of 1.96 at .05 level of significance with 298 degrees of freedom. With this result the null hypothesis was rejected. This result therefore implies that gender significantly influence pupils stress and cheating tendency in examination.

4. DISCUSSION

The result of data analysis relating to hypothesis one reveals that academic stress, financial stress and personal social stress significantly relate with pupils cheating tendencies. Literature review does not directly show a relationship among the sub-variables of stress (as categorized in this study) and cheating tendencies. However in holistic terms the result contradicts the hypothesis and is in line with previous research in the area (Baird, 1980; Kenny et al, 2002; Murdock, et. al 2007; Emaiku, 2012). Personal social stress factors such as lack of time to study for examination, lack of readiness or poor preparation for examination (Emaiku, 2012), poor facilities and unconducive learning environment, were associated with cheating tendencies of students, relationship between financial stress factors such as extrinsic motivation like the need and desire to secure a good job through improved qualification that would guarantee improved finance to secure ones future and cheating tendency were established in literature. (Baker, 2004; Davy, Kinkard, Smith & Trawick, 2007). These findings are supported by the present study. The result of present study also supports the fact that academic stress factors such as fear of failure, emphasis on certification (Emaiku, 2012) and poor scholastic attitude (Whitley & et. al., 2002), are associated with cheating in examination.

On the whole, these results suggest that factors from school and home stress learners and influence their adjustment, emotional state and cognitive outcomes. One plausible explanation for the result of this study is the fact that learners come from different home background, from societies replete with study. Inequalities and attend schools of different standards in terms of teacher quality, capacity and readiness to teach, different exposure to learning experience used available but have a strong need to improve their lives. The homes they come from the nature of their society and the conditions under which they learn could together generate stressful conditions or negative emotional experiences which would likely lead to poor school adjustment and consequently a vice like examination malpractice. Learners for instance who face financial difficulty who are unable to meet up with the provision of their school needs and are unable to relate effectively with others are often tensed up, and become easily frustrated when faced with challenges such as writing examination to earn

good grades to meet up their academic goals and aspirations, such learners would easily resort to cheating where the need arises.

The result of data analysis regarding hypothesis two which examined sex differences in pupils stress and cheating tendencies showed significant sex differences in the variables. On examination of their mean scores, male pupils were found to be more prone to stress (academic $x=19.80$; financial, $x = 18.25$ and personal – social $x=18.89$) and cheating tendencies ($x=29.81$) than their female counterparts with the following mean scores academic stress ($x=17.08$); financial stress ($x=16.57$); personal social stress ($x=17.78$) and cheating tendencies ($x=27.44$).

This results support the work of Bjorklund and Wenestram (1999) as well as Anderman and Daner (2008) who observed small but significant sex differences in academic cheating of students with males scoring higher than females. The result is also in line with the study by Animasahun and Oguniran (2014) who also found that males have higher tendency of involving in examination malpractice than female students in pursuit of academic needs. On the other hand however, the result was at variance with the study carried out by Rotimi, et. al. (2014), who found significant gender relationship in examination malpractice among secondary students with female students being more culpable than males. The result of present study which showed female pupils being less prone to cheating tendencies than male counterparts is not surprising. Generally, females are brought up to be less adventurous, to uphold good values and be more proactive in behaving in socially acceptable ways (Okon, 2010). Hence when faced with crises, examination stress or anxiety, they are likely to do a lot of thinking, take a lot into consideration and then settle for a more rational decision than their male counterparts. Cheating in itself is a deviant behaviour which girls would likely shy away from to stay in line with acceptable norms. Males and females cheat, however the stress of figuring out how to possibly cheat successfully may have made the female pupils cheat less significantly than the male pupils. Hence the female pupils who indulge in malpractice could do so in subtle ways which may escape others observation.

4.1. Limitations of the Study

The study was limited to pupils in public primary schools in Calabar South only. The sample size used for analysis which eventually became the sample utilized for the study was relatively small attrition affected the sample size ($N=419$) originally anticipated for the study. Questionnaire filled were not completely retrieved due in part to wrong entries and other unforeseen circumstances. These of course have implications for the generalizability of the work to the larger population of primary learners in the study area. There is need therefore for a similar study to be undertaken with a larger population.

5. CONCLUSION AND RECOMMENDATIONS

Overall, the result of this study suggests that stress (academic, financial and personal – social) relates significantly with cheating tendencies of primary school pupils. Academic, financial and personal social stressors individually and/or collectively impact on pupils thereby leading them to be inclined to cheating tendencies in order to reduce tension generated for example by the need to pass examination at all cost to secure a means of livelihood or to forge ahead in their academic pursuit. The sex differences observed in pupils' inclination towards cheating results from the way boys and girls are brought up, hence it is socially

created, it is learned through differential socialization processes. In spite of the differential standards girls and boys are exposed to in terms of what girls should do and not do as against boys, the result of this research shows that both girls and boys are inclined to cheating. In view of this, curbing the tendency to cheat in primary school pupils would be an important step towards eliminating the anomaly and improving academic integrity as well as achieving success in academic goal attainment across all levels of education. There is need for a reorientation programme to be mounted to redirect the thinking of learners particularly at the primary level and other stakeholders towards ensuring an examination malpractice free system. An orientation of this nature should be given through advocacy. In this regard, direct teaching could be given to learners, administrators, parents, teachers, policy makers and the society at large about the dangers imposed on individuals by stress the need to de-emphasis sex stereotypes and the gains of curbing cheating in examination. Public enlightenment campaigns, workshop for designated groups like teachers, seminars for teachers, students, parents (through the parent teachers association) and mass media are the different means that could be explored for advocacy. These done may improve stakeholders' inputs in teaching and learning and subsequent elimination of cheating in examination.

REFERENCES

- Anderman, E., Griesinger, T. & Westinger, G. (1998). Motivation and cheating during early adolescence. *Journal of Educational Psychology*, 90(1): 84-93.
- Athanasou, J. A. & Olasehinde, O. (2002). Male and female differences in self – reported cheating. *Practical Assessment Research and Evaluation*, 8 (5). Retrieved May 12, 2016 from <http://PAREonline.net/getvn.asp?V=8&n=5>.
- Anderman, E. M. & Danner, F. (2008). Achievement goals and academic cheating. *International review of social psychology* URK: www.cairn.info/revue-internationale-de-psychologie-sociale-2008-1-page-155, htm.
- Animasahun, R. A. & Ogunniran, J. O. (2014). Correlates of examination malpractice among secondary school students in Oyo State Nigeria. *International Journal of Educational Administration and Policy Studies* 6(9) 181-189; Doi: 10.5897/IJEAPS.2014.0325.
- Akanni, O. O., & Odofin, B. (2015). Reducing examination malpractice in Nigerian schools. Through effective continuous assessment techniques as an alternative to one shot examination in Osun State, Nigeria. *American Journal of Educational Research*, 3(6): 783-789.
- Baird, J. S. (1980). Current trends in college cheating. *Psychology in the Schools*, 17: 515 – 522.
- Bjorklund, M. & Wenestam, C. (1999). Academic cheating: frequency, methods and causes. Paper presented at the European conference on educational research, Lahti, Finland. UkEduco./document/0001364.htm.
- Baker, S. R. (2004). Intrinsic, extrinsic and motivational orientations: their role in university adjustment, stress, well being and subsequent academic performance. *Current Psychology*, 23(3): 189 – 202.
- Davy, J. A., Kincaid, J. F., Smith, K. J. C., Trawick, M. A. (2007). An examination of the role of attitudinal characteristics and motivation on the cheating behaviour of business students. *Ethics and Behaviours*, 17(3): 281-302.
- D'Archy, A.B. & Ingrid, U. (2007). Gender differences in student's ethics: Are females really more ethical? Ann-Arbor, MI: Michigan Publishers.
- Emaiku, S. O. (2012). Assessing the impact of examination malpractices on measurement of ability in Nigeria. *International Journal of Social Science*, 2(4): 748-757.

- Hensley, L. C., Kirkpatrick, K. M. & Burgeon, J. M. (2013). Teaching in higher education. <http://dx.doi.w.1080/13562517.2013.827641>.
- Iheanacho, R.A.E. (2002). Psychology of learning. Owerri: G.O.C International Publishers.
- Kenny, M. E., Gallagher, L. A., Alvarez-Salvat, R. & Silsby, J. (2002). Source Support and Psychological Distress among Academically Successful inner-city youth. *Adolescence* 37(145): 161 – 182.
- Kaplan, D. S., Liu, R. X. & Kaplan, H. B. (2005). School related stress in early adolescence and academic performance three years later: The conditional influence of self – expectations. *Social psychology of education: An international Journal*, 8: 3 -17.
- Murdock, T. B., Hale, N. M. C., Weber, M. J. (2001). Predictors of cheating among early adolescents: Academic and social motivations. *Contemporary Educational Psychology*, 26: 96-115.
- Murdock, T. B., Miller, A. D. & Goetzinger, A. (2007). Effect of classroom context on university students' judgments about cheating: mediating and moderating processes. *Social Psychology of Education*, 10(2): 141 – 169.
- Newstead, S. E., Franklyn – Stokes, A. & Armstead, P. (1996). Individual difference in students cheating. *Journal of Educational Psychology*, 8: 229-241.
- Okon, M. O. (2010). Psychosocial instigators of aggressive tendencies among university students in the south-south Geopolitical zone of Nigeria. Unpublished Ph.D Thesis.
- Omonijo, D. O. & Nnedum, (2012). A study of the cheating habits of students in three selected universities in Nigeria. *Wufenia multidisciplinary Journal*, 8(4): 37-42.
- Okon, M. O. & Petters, J. S. (2015). Parental involvement and academic performance of secondary school students in Calabar South Local Government Area of Cross River State. *International Journal of Educational Administration, Planning and Research*, 7(2): 212-220.
- Rotimi, O. A., Omonijo, D. O. & Uche, O. O. (2014). Influence of personality types and socio-demographic characteristics of students in examination malpractice. Case of secondary schools in Ibadan. *European Journal of Scientific Research*, 124(4): 486-499.
- Singhal, A. C. (1982). Factors in students dishonesty. *Psychological reports*, 51: 775-780.
- Sulaiman, T., Hassan, A., Sopian, V. M. & Abdullah, S. K. (2009). The level of stress among students in urban and rural secondary schools in Malaysia. *European Journal of Social Sciences*, 10(2): 179 – 184.
- Smith, M., Segal, R. & Segal, J. (2011). Understanding stress. Symptoms, signs, causes and effects. Retrieved from www.helpguide.org/mental/stress-signs.html. Oct 18, 2011.
- Taylor, S. E. (1999). *Health Psychology*. New York: McGraw Hill.
- Udoh, N. A. (2011). Remote causes and counselling implications of examination malpractice in Nigeria. *Students Pulse*, 3(10): 171.
- Whitley, B., & Keith – Spiegel, P. (2002). *Academic dishonesty: An educator's guide*. Mahwah, NJ: Lawrence Erlbaum.

Online Science Publishing is not responsible or answerable for any loss, damage or liability, etc. caused in relation to/arising out of the use of the content. Any queries should be directed to the corresponding author of the article.