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WEST AFRICAN JOURNAL OF OPEN AND FLEXIBLE LEARNING

Aims and Scope

The West African Journal of Open and Flexible Learning exists to facilitate and encourage high-quality scholarship on important theoretical and empirical work in Open and Distance Learning (ODL), research as well as research in all disciplines that could be taught and learnt through the open and distance learning approach. Researches in the Sciences and Social Sciences, Humanities, Law, etc. are therefore equally encouraged especially those whose findings have identifiable implications for open and distance learning. ODL is a rapidly developing discipline which encourages teachers and learners of all disciplines to think of alternative modes of content delivery; alternative to the conventional face-to-face method, particularly for purposes of expanding access to the discipline. Hence, there is a need for all disciplines to research the best ways of applying the ODL philosophy.

WAJOFEL is published twice annually.

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About RETRIDOL

The Regional Training and Research Institute for Distance and Open Learning (RETRIDOL) is an international institute established under a collaborative agreement between the Commonwealth of Learning (COL) and the National Open University of Nigeria (NOUN) in 2003. It is mainly for capacity building and research in Open and Distance Learning (ODL) for the West African sub-region, and anywhere in Africa when the need arises.

The primary purpose of the institute is in three broad but interrelated parts: first, the institute has the mandate to plan and implement programmes to meet the training and capacity development needs of practitioners of open and distance learning-administrative, technical/technological and academic within the West African sub region.

Second, the institute is mandated to initiate, carry out, and support research in all areas of open and distance learning and its ancillary fields. While the institute facilitates research into open and distance learning as a field of enquiry, it is also involved in promoting discipline-based researches which have implications for open and distance learning. In doing this, the institute is expected to provide necessary training in research, and support to early career researchers and experienced academics undertaking research. The institute is also required to provide opportunities for the dissemination of research outcomes through its dedicated website, newsletter and regular journal. The third strand of RETRIDOL's mandate is to serve as a platform for intra-regional and inter-regional cooperation and linkages between open and distance learning institutions, organisations and professional associations in West Africa and the rest of the world.

RETRIDOL is domiciled within the National Open University of Nigeria, Abuja, Nigeria. The vision of the institute is to be seen as a centre of excellence in open and distance learning in the West African sub-region through the promotion of workable policies, development of accountable strategies, the promotion of useful research activities,

networking and collaboration for the purposes of attaining excellence in open and distance learning.

To achieve its mandate, the institute has been focusing on meeting the training needs of open and distance learning institutions including single-mode, dual-mode, consortium and solely electronic modes in the West African sub-region. This way, it intends to build a network of open and distance learning trainers and core professionals in ODL in the sub- region.

More than thirty institutions have participated in various RETRIDOL activities from The Gambia, Sierra Leone, Ghana, Cameroon, Nigeria and Tanzania over the last few years to respond to various needs. Many more are expected to participate in the future. The feedback from many of the institutions and individual participants has been very encouraging. The institute has its activities supervised by an International Advisory Board with members from the Commonwealth of Learning and the West African sub-region.

Profil de RETRIDOL

L'Institut régional de formation et de recherche en enseignement à distance (RETRIDOL) est un institut international établi dans le cadre d'un partenariat entre le Commonwealth of Learning et la National Open University (NOUN). Il est, avant tout, destiné à la formation et la recherche dans le domaine de l'enseignement à distance (FOAD) pour la sous-région de l'Afrique de l'Ouest, et partout en Afrique en cas de besoin.

Le rôle principal de l'institut se répartit en trois volets, à la fois vastes mais complémentaires. D'abord, l'institut a pour mandat de planifier et de mettre en œuvre des visant à répondre aux besoins de formation et de développement des capacités des professionnels de l'enseignement à distance – soit administratif, techniques/technologiques et intellectuels dans la sous-région de l'Afrique de l'Ouest.

Deuxièmement, l'institut a pour tâche d'initier, de réaliser et de renforcer la recherche dans tous les domaines de l'enseignement à distance et les champs auxiliaires. Alors que l'institut sert à faciliter la recherche sur l'enseignement à distance en tant que domaine de recherche, il est également impliqué dans la promotion de recherches à caractère strictement spécifique qui ont des significations pour l'enseignement à distance. Pour ce faire, l'institut est supposé assurer la formation nécessaire à la recherche et fournir un soutien aux chercheurs débutants et aux universitaires expérimentés pour mener à bien leurs recherches. L'institut est également tenu de fournir des opportunités de diffusion des des résultats de la recherche par le biais de son site web, son bulletin d'information et sa revue officielle.

Le troisième volet du mandat de RETRIDOL consiste à servir comme base pour la coopération intra-régionale et inter-régionale et ainsi que la connexion entre institutions, organisations et associations professionnelles d'enseignement à distance en Afrique de l'Ouest et dans le monde entier.

RETRIDOL est abrité au sein de la National Open University du Nigeria, Abuja, Nigeria.

La vision de l'institut est d'être un centre d'excellence de l'enseignement à distance dans la sous-région ouest-africaine par la promotion de mesures pratiques, le développement de stratégies pertinentes, la promotion d'activités de recherche bénéfiques et l'initiation de réseaux, ainsi que des collaborations dans le vue d'atteindre l'excellence dans l'enseignement à distance.

Pour réaliser son mandat, l'institut s'est consacré à la satisfaction des besoins de formation dans institutions d'enseignement à distance, y compris les instituttions de mode unique ou le mode mixte, ansi que le consortium et le mode uniquement électronique dans la sous-région ouest-africaine. De cette façon, il a l'intention de construire un réseau de formateurs de l'enseignement à distance et un noyau de professionnels de l'ensignement à distance (LD) dans la sous-région.
Au cours des dernières années, plus de trente institutions de la Gambie, du Sierra Leone, du Ghana, du Cameroun, du Nigeria et de la Tanzanie ont participé à diverses activités RETRIDOL pour répondre à divers besoins. Nous espérons que beaucoup d'autres institutions devraient y participer dans les années prochaines. Le feedback de la part de nombreux participants individuels et des institutions participantes sont très positifs.

Les activités de l'institut sont supervisées par un conseil consultatif international composé de membres du Commonwealth of Learning et d'autres membres sont la sous-région de l'Afrique de l'Ouest

EDITORIAL

In this edition of WAJOFEL, the multidisciplinary nature of research in Open and Distance Learning is on display. The disciplines include adult learning, Library science, English studies, and computer studies. There are five articles in the research article section of this volume, and they address topics such as student enrollment forecast, low-cost digital libraries, interactive pedagogical tools, and Language use in asynchronous facilitation. The authors discuss issues of access, technological and pedagogical support for learners in distance learning and online learning contexts. The commentary section presents a keynote address and the volume closes with the book review section.

Adoga et al investigate Choosing a Forecast Model for Prediction of Students' Enrolment in Multiple Programmes of the National Open University of Nigeria: Towards Course Materials Production Planning. Forecasting student enrollment is crucial for effective income and expenditure planning in educational institutions like the National Open University of Nigeria (NOUN). In choosing the best forecast model from various statistical methods, the authors selected the Holt Winters additive seasonal model because it showed a relatively constant seasonality in NOUN's enrollment data. Comparing numeric goodness-of-fit values for multiple time series proved to be a simple and reliable approach. Accurate enrollment forecasts aid in course material production, faculty hiring, and budgeting. The recommended Holt Winters additive technique should be employed by NOUN and similar institutions for accurate enrollment predictions.

Okonkwo in a study of e-Granary Electronic Library: A Panacea for Effective Low-Cost Means of Knowledge and Lecture Delivery for Distance Learning in the National Open University of Nigeria, examines the potential use and benefits of the e-Granary digital library, also known as the "Internet in a Box," as an essential tool to provide information and knowledge for human resources in low-income communities, and specifically in distance learning contexts. It serves as an offline information store, offering access to over 35 million digital resources for those with limited Internet connections. In the author's view, the digital library overcomes challenges faced by academic institutions, such as lack of funds and stable electricity supply, making it a cost-effective solution for distance learning in rural areas.

Akinyemi and Ologunada investigate Perceptions of Teachers and Students on the use of Interactive Learning Instructional Package (ILIP) in Nigeria Senior Secondary Schools in Ondo State, Nigeria for teaching BASIC programming. Both students and teachers perceive ILIP as effective and beneficial for learning. However, challenges such as insufficient time allocation for computer studies, lack of resources, and inadequate technical support hinder its full implementation. They recommend incorporating ILIP in the curriculum, providing necessary resources, and offering training for teachers to optimise its use and enhance students' learning outcomes in BASIC programming.

Patrick and Abaa in their study titled, Assessment of Power and Load Factors in Older Adult Learners' Margin to Learn in National Open University of Nigeria focused on open and distance learning (ODL) for older adults (aged 60 and above). They found that older adult learners face challenges in learning due to factors such as low stamina for learning, lack of institutional support, and financial constraints. Using McClusky's theory of margin, which emphasises the interplay of power (resources) and load (demands) in learning they found the margin to learn to be low due to higher load factors compared to available power factors. Participants expressed the need for support and assistance to overcome these challenges and continue their studies. The study also revealed that older learners have low ICT skills but high peer support. The load factors in learning for older adults include family pressure, career demands, and religious commitment. To motivate older learners, the authors recommend interventions informed by the findings of the study such as older adult learners reducing load factors and increase power through support services and ICT skill development. They also recommend that further research with a larger sample size to generalise the findings.

Bibian Ugoala examines Achieving error-free posts in Asynchronous facilitation: Findings from the Discussion Forum Posts of 100 Level Students of National Open University of Nigeria. The errors are in the use of the simple past tense (SPT) in asynchronous online discussion posts of 100 level students at the National Open University of Nigeria (NOUN). Errors in regular and irregular verbs were identified, including omission, addition, and mis-selection of morphemes. The irregular verbs posed more challenges for students, likely due to the lack of specific rules for their past tense formation in English. Interference from learners' first language (L1) did not seem to be the main cause of errors. To mitigate these errors,

Ugoala recommends the use of prompts on discussion platforms to help motivate learners to use the correct past tense forms and improve their communication skills. This would also provide technological and pedagogical support for learners' self-mastery of the English tenses and writing in general.

In the commentary section of this volume, **Olufemi Peters**, Vice-Chancellor National Open University of Nigeria's keynote at the Open University of Tanzania's graduation ceremony, on 24th November 2022, explores the Contributions of Open and Distance Education to Africa's Social-Political and Economic Development. Peters emphasises the challenges faced by Africa and the need for open and distance learning to address issues like political instability, poverty, and inadequate education systems. He highlights the potential benefits of distance education in providing access, quality, and cost-effective education to a rapidly growing population. He notes that ODL has already made significant contributions, such as empowering marginalised groups, meeting special social needs, and reducing brain drain. The National Open University of Nigeria is cited as an example, providing arrangements for special needs candidates, promoting leadership development, vocational training, self-discipline, lifelong learning, internationalisation, and ICT penetration. Peters concludes that although challenges persist, ODL's positive impact on socio-economic development in Africa is acknowledged, and its potential to contribute to development goals of the continent, the African Union's ***Agenda 2063, The Africa We Want***, remains crucial.

In the book review section, **Felix Olakulehin** reviews a book collection of papers edited by Online and Distance Education for a Connected World edited by Linda Amrane-Cooper, David Baume, Stephen Brown, Stylianos Hatzipanagos, Philip Powell, Sarah Sherman and Alan Tait.

I thank our contributors for choosing WAJOFEL as the platform to share their research, our reviewers for their valuable contributions and the editorial team for putting together this issue. We hope readers will find this issue valuable and look forward to receiving more manuscripts from across the globe.

Professor Christine Ofulue,
Managing Editor, WAJOFEL

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Choosing a Forecast Model for Prediction of Students' Enrolment in Multiple Programmes of the National Open University of Nigeria: Towards Course Materials Production Planning

Choix d'un modèle de prévision de l'inscription des étudiants à plusieurs programmes de l'Université nationale ouverte du Nigeria : La planification de la production des supports de cours

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Abstract

Budgeting for highly capital-intensive activities such as course material development, hiring of facilitators and conduct of examinations in Open and Distance Learning (ODL) institutions rely greatly on the number of students admitted yearly. The need for an effective forecast model for the prediction of students' enrolment in ODL institutions can therefore not be overlooked. In this study, we tested seven different exponential smoothing forecasting models on

sampled data of students' admission into the National Open University of Nigeria (NOUN) programmes for a period of 16 years, in view of finding a single forecast method that will be effective in forecasting future enrolment of students into all programmes of NOUN. The students' enrolment data were collected twice a year corresponding to admissions made in each semester of the year as practiced in NOUN, forming a time series with 32 observations for each programme. The stationary R^2, MAPE and MAE goodness-of-fit measures obtained from the methods were compared to obtain the best performing model. The Holt Winters Additive model performed better than others with a mean stationary R^2 of 0.583 and a very low mean standard error (SE) of 0.127 for the sampled programmes, hence it was chosen as the forecast model for prediction of future outcomes. The result of this work is useful in describing the pattern of students' enrolment in NOUN over the past years and for forecasting of student population in each programme offered in NOUN.

Keywords: Students enrolment forecasting, Exponential smoothing model, SPSS, time series analysis, Open and Distance Learning.

Résumé

La budgétisation d'activités à forte intensité de capital telles que le développement de matériel de cours, l'embauche de facilitateurs et la conduite d'examens dans les établissements d'enseignement ouvert et à distance (EOD) dépend fortement du nombre d'étudiants admis chaque année. La nécessité d'un modèle de prévision efficace pour prédire le nombre d'étudiants dans les établissements d'enseignement ouvert et à distance ne peut donc pas être négligée. Dans cette étude, nous avons testé sept modèles différents de prévision par lissage exponentiel sur un échantillon de données relatives à l'admission des étudiants dans les programmes de l'Université nationale ouverte du Nigeria (NOUN) sur une période de 16 ans, afin de trouver une méthode de prévision unique qui soit efficace pour prévoir les inscriptions futures des étudiants dans tous les programmes de NOUN. Les données relatives aux inscriptions des étudiants ont été collectées deux fois par an, ce qui correspond aux admissions effectuées au cours de chaque semestre

de l'année, comme cela est pratiqué à NOUN, formant ainsi une série temporelle de 32 observations pour chaque programme. Les mesures stationnaires R2, MAPE et MAE de qualité d'ajustement obtenues à partir des méthodes ont été comparées pour obtenir le modèle le plus performant. Le modèle additif de Holt Winters a donné de meilleurs résultats que les autres, avec un R2 stationnaire moyen de 0,583 et une erreur type moyenne très faible de 0,127 pour les programmes échantillonnés, et il a donc été choisi comme modèle de prévision des résultats futurs. Le résultat de ce travail est utile pour décrire le modèle d'inscription des étudiants à NOUN au cours des dernières années et pour prévoir la population étudiante dans chaque programme offert à NOUN.

Mots-clés : Prévision des inscriptions des étudiants, modèle de lissage exponentiel, SPSS, analyse des séries temporelles, enseignement ouvert et à distance.

Introduction

Forecasters have in time past provided answers to questions such as, how much rainfall is expected in a forecast year, how much an economy will grow over a period of time, what direction a stock markets will take, the rate of call arrival at call centers, etc., using different forecasting methods. There is also growing interest in the area of student enrolment forecasting because of its importance in school administration and management. Forecasting of students enrolment into a school is the first step towards successful income and expenditure planning. This is because there is direct relationship between student population and their demand for services and products such as Course Materials.

Hillier & Lieberman (2001) discussed two main types of forecasting methods; the Statistical forecasting methods which uses historical trends to predict future outcomes and the judgmental forecasting methods which on the other hand solely uses expert judgment where historical data is not readily available. Most statistical forecasting methods use time series which are historical data from a series of

observations of some quantity of interest, over time. The Moving Average model and the Exponential Smoothing model of forecasting are the most commonly used statistical forecasting methods. There are however, many more sophisticated methods for forecasting the expected values of random variables, for example the Box-Jenkins and ARIMA models, but these methods are not popular for production applications, in which forecasts for many items are required (Murty, 2006). In this research work, we shall focus more on the exponential smoothing methods considering their usefulness in the nature of problem we wish to solve.

According to Murty (2006), the exponential smoothing method introduced and popularized by Brown R.G in 1959, is perhaps the most popular forecast method in practice. There are several variations of the exponential smoothing method. They can be categorized into non-seasonal and seasonal exponential models. The Statistical Package for Social Sciences version 25 (SPSS 25) provides tools for executing the simple, Holt's Linear trend, Brown's linear trend and Damped trend non-seasonal exponential models. It also provides simple, Holt Winters additive and Holt Winters multiplicative seasonal exponential models which were all tested in this work. The Holt Winters additive seasonal model which was chosen in this work is preferred when a time series has a linear trend with a relatively constant seasonal pattern (Hyndman & Athanasopoulos, 2018), such that the level, growth rate and the seasonal pattern may be slowly changing over time.

Selecting a suitable forecast model from the wide range of available methods is a major problem faced by many forecasters. According to Arsham (2015), using visual comparison of several forecasts models to assess their accuracy and choosing the best model is a widely used approach in model selection. In such approach, the original values of a time series variable and the predicted values from different forecasting methods are first plotted on the same graph, thus facilitating a visual comparison. Another method for choosing the best forecast model available in literature is the comparison of the goodness-of-fit measures obtained from different models. Such fit measures include Mean Absolute Error (MAE), Root Mean Square Error of Prediction (RMSEP), Root Mean Square Error (RMSE), Mean Absolute

Percentage Error (MAPE), Mean Absolute Scaled Error (MASE), Mean Squared Error (MSE), R-Squared values etc.

The National Open University of Nigeria offers wide range of programmes across its eight faculties with over Five Hundred Thousand students spread across over One Hundred Study Centres nationwide. Every Semester, there is need to distribute thousands of distinct printed Course materials to these students at their different locations to enable them study and prepare for examination. In recognition of the importance of Course Materials in Open and Distance Learning Institutions, most ODL institutions have special units where all their Course Materials are processed. In NOUN, the Course Material Development Unit (CMDU) amongst others is responsible for timely printing of the required number of Course Materials based on students' trend of admission (National Open University of Nigeria, 2023). To be able to produce and distribute adequate number of Course Materials within a budget year and to reduce the incidences of non-availability of some Course Materials at the Study Centres when demanded by students, there is need to employ effective Decision Support Systems with inbuilt forecast models that can effectively predict students' enrolment within such periods (Adoga et al., 2022a). This research outlines the procedures involved in choosing an effective forecast model which is the first and probably the most technical step in the series of activities leading to accurate forecast of students' enrolment into different programmes of NOUN.

Related Works

Lazar & Lazar (2015) applied different methods to forecast enrolment of the two categories of students admitted to University of Petroleum-Gas (UPG) of Ploiesti. They tested several trend functions using the relevant tools in Ms EXCEL program. The R-Squared values obtained from the test for each category of students were compared. A forecast was also made using extrapolation based on average change. The result of the work showed a decrease in the trend manifested in recent years, thus, a projected 25% decrease in the number of admitted students over the next five years was made. Chen (2015) developed an integrated enrolment forecast model aimed at studying the variables affecting

student enrolment and to aid in accurate forecasts. The study first applied ARIMA methodology and then linear regression analysis and lastly three model selection criteria were used to determine the best ARIMA and linear regression models. The values of R- squared and MAPE were used in making judgment and choosing of the best model. Yang et al. (2020) proposed the whale optimization algorithm and support vector regression (WOASVR) algorithm combined with whale optimization algorithm (WOA) and support vector regression (SVR) for forecasting of student enrolment and teacher statistics. The research used the data of student and teacher population between 1991 and 2018 to test the performance of the proposed model. The forecast power of the WOASVR approach was compared with five other models: ARIMA, ETS, TBATS, GRIDSVR, and PSOSVR. The WOASVR model performed better than other tested models indicating that it is a better method for predicting student enrolment and teacher statistics. Chen et al. (2019) developed statistical models to predict international undergraduate student enrolment at a Midwest university. They developed a Seasonal Autoregressive Integrated Moving Average model with input variables to estimate future enrolment. One problem they encountered was insufficient records of international undergraduate enrolment to support a high quality time series model as common with higher institutions records. The enrolment data was therefore collected semester wise to bridge the gap and to reflect seasonality. They were of the view that instead of tracking back 40–50 years of enrolment data, introducing seasonality into the model will allow researchers to conduct a robust time series analysis by analyzing 15 to 20 years of the enrolment data instead of hunting for 40-50 years data to no avail. Lavilles & Arcilla (2012) in their paper added a forecasting module to the school management system to help in predicting the number of students expected to enroll in a subject. The simple moving average of order 3, Simple Exponential Smoothing and Double Exponential Smoothing statistical models were tested in the work using MAPE as the fit criteria. Results showed about 58% of subjects had least average MAPE when Double Exponential Smoothing is applied with varying alpha and beta, while Simple Exponential Smoothing was used for the remaining subjects with alpha having least MAPE.

Barman & Hasan (2017) analyzed the most appropriate time series forecasting methods on the short term and long term considering many available options like the Moving Averages method, Linear Regression with Time, Exponential Smoothing, Holt's Method, Holt-Winter's Method etc. MSE, MAPE, MAD were used in the paper as measures of accuracy on sampled data. Test results showed Holt Winters Multiplicative Forecasting Method gave less forecasting errors for the set of analyzed data, it was hence adopted as the most appropriate forecasting method in the research. Kuzmin et al. (2017) also made a case for the use of the Holt Winters model to forecast product mixes in the upmarket sector. The research compared RMSE and MAE values obtained from different forecast models and chose the model with the best values as the most effective model for forecasting product mixes in the upmarket sector. Tularam & Saeed (2016) explored the natures of statistical predictors by presenting time series analyses for oil prices data. To determine the best model, six model selection criteria were applied and the appropriate time series to which to apply the exponential smoothing (ES), Holt Winters (HW) and ARIMA models was chosen. The MSE, RMSE, MAE, MAPE and Theil's U-statistic were used as the model selection criteria. Results showed ARIMA forecast yielded the smallest values for the six selection criteria indicating that it is the best of the three methods. Odame et al. (2014) used Holt Winters Multiplicative model to forecast assisted childbirths at the Teaching Hospital in Ashanti, Ghana. The study applied Holt Winters methods to the dataset of number of quarterly assisted deliveries at Hospital (KATH) from 2000-2011. The Holt Winters multiplicative and additive forecasting models were applied on the data. The Multiplicative model reported lower values of RMSEP, RMSE, MAPE and MASE than the Additive model. The multiplicative model passed the Shapiro-Wilks test in addition and was hence chosen as the best forecast model for the research work.

Materials and Methods

Here we discuss the method of data collection, sampling strategy, method of data analysis and specification of the general procedures followed in carrying out this study.

Data Collection

The number of students that enrolled in various programmes of NOUN from 2004 – 2019 formed the primary data used in this research. The population for the study is all the programmes offered in NOUN since its resuscitation in 2002. There were a total of 94 programmes mounted collectively from 2004 – 2019. During the period, we observed that some programmes were discontinued shortly after they were mounted while some were newly introduced. The sample for the study therefore comprised 45 programmes that have been mounted for at least ten years. The samples were chosen in such a manner as to satisfy the rule of thumb that in time series analysis more observations or data points are always preferable but at the very least, a time series should be long enough to capture the phenomena of interest. The length of a time series can vary, but are generally at least 20 observations long and many models require at least 50 observations for accurate estimation (McCleary et al., 1980). Hyndman & Kostenko (2007) also estimated the minimum sample size requirement for Holt Winters seasonal forecasting methods to be m+5 observations, where m is the seasons per year. That is 9 observations for quarterly data, 17 for monthly and 7 for the biannual data used in this study. Our data was sourced from the Management Information Systems units of NOUN.

The data of students' enrolment were collected twice each year corresponding to admissions made each semester as practice in NOUN. The 16 years data (2004- 2019) therefore formed a time series with 32 observations for each programme.

Data Analysis

The resultant 45 time series data were analysed on the Statistical Package for Social Sciences version 25 (SPSS 25) using the following steps:

- The data was first transcribed in computer readable form for statistical analysis as shown partly in appendix 1.
- Seasonal Decomposition test was carried out on each of the time series. Results showed existence of seasonality and trend in all 45 time series data.

- Forecast of future outcomes of each time series data were done using the following seven Exponential Models: Simple non-Seasonal (SN), Holt's non-Seasonal (HN), Brown's Linear trend non-Seasonal (BLT), Damp Trend non-Seasonal (DT), Simple Seasonal (SS), Holt Winters Additive seasonal model (HWA) and Holt Winters Multiplicative (HWM seasonal model). This was done in order to choose the best model for forecasting of future outcomes. Figures 1-3 show the outputs of the Holt Winters Additive forecasting method carried out on the time series.
- The Stationary R^2, MAPE and MAE values obtained from each tested forecast model were recorded and used to measure the accuracy of the model. Tables 1 – 4 show the comparison of the fit criteria obtained from the different tested models.

The Holt Winters Additive Model

If $y_1, y_2, \ldots .y_n$ denote a time series with m seasonal period then:

$$Y_t = L_t + S_t + \varepsilon_t \quad (1)$$

$$\hat{Y}_{t+h}(t) = L_t + B_t h + S_{t+h-m} \quad (2)$$

Where:

Y_t denotes the observations (actual data) and t is an index denoting a time period (t=1,2,…,n)

$\hat{Y}_{t+h}$ is the forecast at h periods ahead, h is the step ahead forecast (the period to be predicted).

$L_t = \alpha(Y_t - S_{t-m}) + (1-\alpha)(L_{t-1} + B_{t-1})$ = Estimate of the Level of the series (3)

$B_t = \beta(L_t - L_{t-1}) + (1-\beta)B_{t-1}$ = Estimate of the trend of the series (4)

$S_t = \gamma(Y_t - L_t) + (1-\gamma)S_{t-m}$ = Estimate of the Seasonal factor of the series (5)

ε_t is the forecast error.

α, β, and γ are constants that take a value between 0 and 1.

The Holt Winters additive model is formulated, initialized and solved using the above equations or using Software packages like SPSS, R, Microsoft Excel, Python programming etc.

Results and Discussion

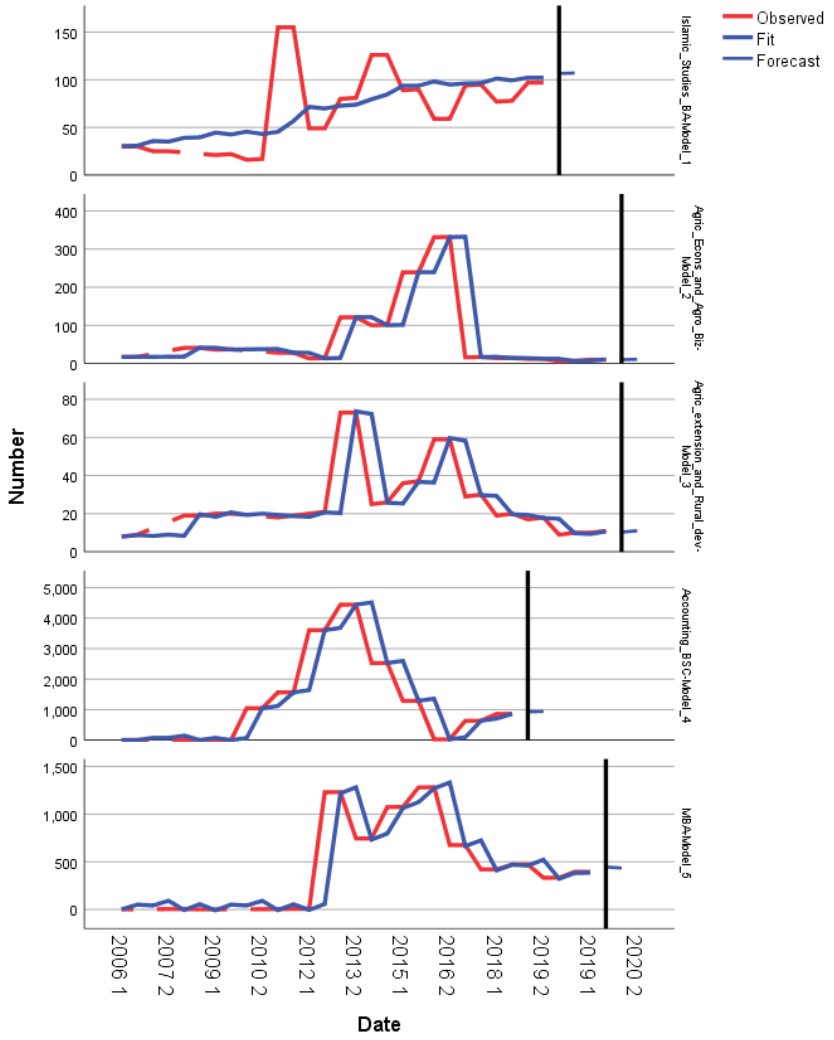

Figure 1: The output of the Holt Winters Additive forecast carried out on the time series data of 5 programmes across different faculties of NOUN.

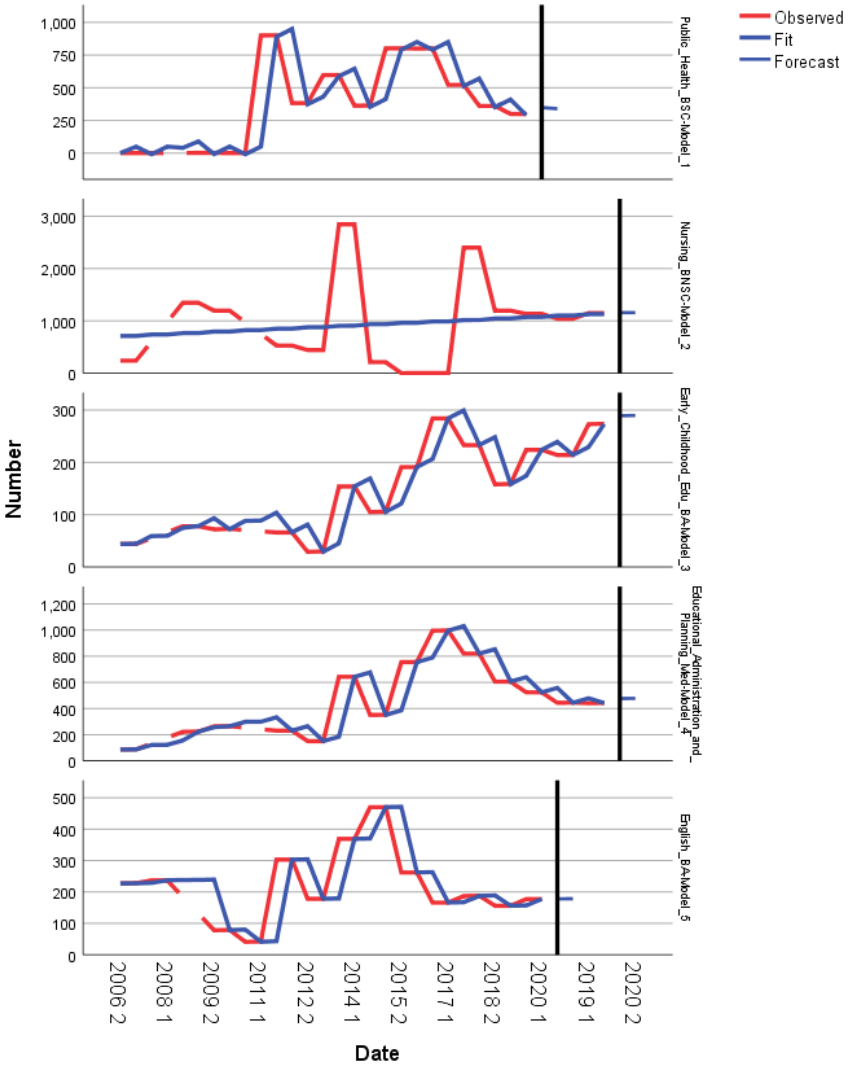

Figure 2: The output of the Holt Winters Additive forecast carried out on the time series data of another 5 programmes across different faculties of NOUN.

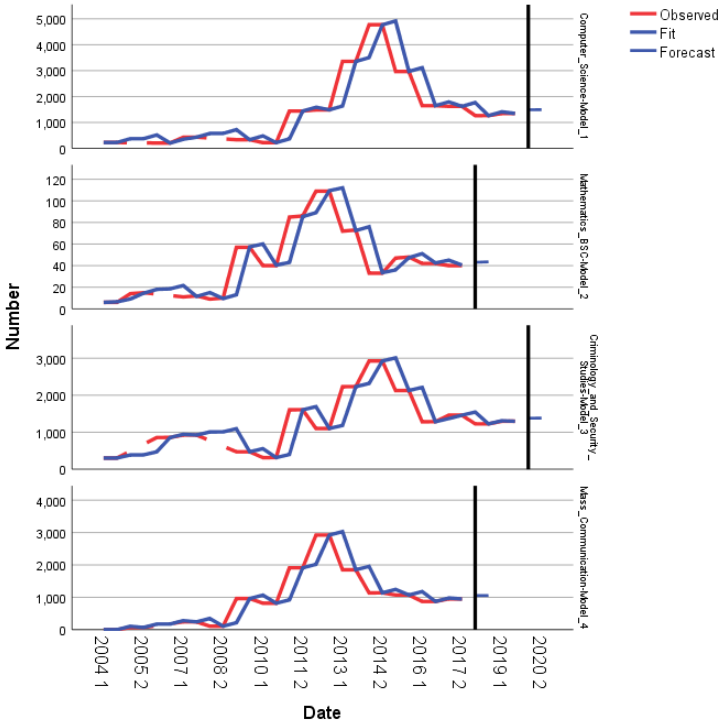

Figure 3: The output of the Holt Winters Additive forecast carried out on the time series data of another 4 programmes across different faculties of NOUN.

Figures 1-3 show the trends and patterns of some programmes time series data when the Holt Winters Additive model was used to forecast future values of the series. These trends and patterns were obtained for each of the seven forecast models applied on all the programmes. The trends and patterns obtained from the HWA model shows existence of seasonality in all the times series. Although a large number of the time series appear to be correlated as seen in their trends and patterns, it was extremely difficulty to completely study their individual properties and relationships using their patterns, considering the large number of time series data tested in this research. To reduce error in the best model selection process therefore, the numeric goodness-of-fit values obtained from the seven tested forecast models for each time series were compared and analyzed as shown in Table 1.

Table 1: Comparing the stationary R^2 values obtained from the 7 forecast models applied on each of the 45-time series data.

		stationary R^2 values								
SN	Time Series (Programmes)	Simple non-seasonal Model	Brown non-seasonal Model	Damp Trend	Holt non-seasonal Model	Simple Seasonal Model	Holt Winters Additive Model	Holt Winters Multiplicative Model	**Best value**	Best Method of Estimation
1	B.Sc. Public Health-Model_1	-0.003	0.419	0.003	0.5	0.656	0.658	0.67	0.67	Holt Winters Multiplicative Model
2	B.A (ed)Early Childhood Education-Model_2	-0.033	0.387	0	0.52	0.605	0.644	0.594	0.644	Holt Winters Additive Model
3	B.A (ed) French Education-Model_3	0.14	0.623	0.327	0.69	0.846	0.855	0.853	0.855	Holt Winters Additive Model
4	B.A (ed) Primary Education-Model_4	-0.003	0.366	-0.003	0.5	0.58	0.588	0.566	0.588	Holt Winters Additive Model
5	B.A (ed) English Education - Model_5	-0.003	0.383	-0.003	0.5	0.605	0.61	0.594	0.61	Holt Winters Additive Model
6	B.A English-Model_6	-0.003	0.328	-0.003	0.5	0.61	0.61	0.61	0.61	Simple Seasonal Model
7	B.A French International	0.045	0.542	0.046	0.52	0.698	0.698	0.685	0.698	Holt Winters Additive Model

	Studies - Model_7									
8	B.A Islamic Studies-Model_8	0.021	0.487	0.146	0.57	0.681	0.727	0.724	0.727	Holt Winters Additive Model
9	B.Agric Agricultural Economics and Agro-Business-Model_9	0	0.354	0	0.5	0.569	0.569	0.569	0.569	Simple Seasonal Model
10	B.Agric Agricultural Extension and Rural Development-Model_10	-2.20E-05	0.447	0	0.5	0.655	0.655	0.659	0.659	Holt Winters Multiplicative Model
11	B.Sc.(ED) Agricultural Science-Model_11	-3.72E-05	0.411	-3.09E-05	0.5	0.652	0.652	0.644	0.652	Simple Seasonal Model
12	B.Sc.(ED) Biology-Model_12	-0.015	0.386	-8.65E-05	0.51	0.553	0.571	0.49	0.571	Holt Winters Additive Model
13	B.Sc.(ED) Chemistry-Model_13	-0.003	0.386	-0.001	0.5	0.616	0.62	0.569	0.62	Holt Winters Additive Model
14	B.sc Integrated Science Edu-Model_14	0.001	0.468	-0.004	0.52	0.616	0.619	0.62	0.62	Holt Winters Multiplicative Model

15	B.sc(Ed) Mathematics Education-Model_15	-0.002	0.375	-0.002	0.5	0.581	0.584	0.566	0.584	Holt Winters Additive Model
16	B.Sc.(ED) Physics-Model_16	-0.002	0.381	-0.002	0.5	0.621	0.623	0.635	0.635	Holt Winters Multiplicative Model
17	B.sc Accounting-Model_17	-0.003	0.454	0.101	0.5	0.2	0.205	0.183	0.5	Holt non seasonal Model
18	B.Sc. Computer Science-Model_18	-0.005	0.413	0.026	0.5	0.371	0.378	0.273	0.5	Holt non seasonal Model
19	B.Sc. Cooperative Management-Model_19	0.018	0.505	0.051	0.53	0.697	0.702	0.704	0.704	Holt Winters Multiplicative Model
20	B.Sc. Criminology and Security Studies-Model_20	-0.006	0.353	-0.001	0.5	0.563	0.572	0.52	0.572	Holt Winters Additive Model

stationary R^2 values

SN	Time Series (Programmes)	Simple non-seasonal Model	Brown non-seasonal Model	Damp Trend	Holt non-seasonal Model	Simple Seasonal Model	Holt Winters Additive Model	Holt Winters Multiplicative Model	**Best value**	Best Method of Estimation
21	B.sc Entrepreneur Business Management-Model_21	-3.61E-05	0.393	0.008	0.5	0.444	0.442	0.458	0.499	Holt non seasonal Model
22	B.sc Environmental studies and resources Mgt-Model_22	-0.003	0.439	0.055	0.5	0.305	0.311	0.168	0.5	Holt non seasonal Model
23	B.Sc. Mass Communication-Model_23	-0.005	0.399	-0.001	0.5	0.449	0.458	0.45	0.5	Holt non seasonal Model
24	B.Sc. Mathematics-Model_24	-0.007	0.369	-0.007	0.5	0.536	0.542	0.502	0.542	Holt Winters Additive Model
25	B.Sc. Maths and Computer Science-Model_25	-0.001	0.394	-0.001	0.5	0.637	0.637	0.467	0.637	Holt Winters Additive Model
26	B.sc Peace Studies and Conflict Resolution-Model_26	-0.001	0.312	-0.002	0.5	0.616	0.622	0.591	0.622	Holt Winters Additive Model

27	B.sc Political Science-Model_27	-0.003	0.449	0.101	0.5	0.166	0.173	0.148	0.501	Holt non seasonal Model
28	B.Sc. Tourism Studies-Model_28	-0.004	0.359	-0.004	0.49	0.541	0.54	0.545	0.545	Holt Winters Additive Model
29	B.sc (Ed) Business Education-Model_29	-0.003	0.405	0.003	0.5	0.457	0.462	0.39	0.501	Holt non seasonal Model
30	B.NSc. Nursing -Model_30	0.097	0.548	0.119	0.58	0.714	0.711	0.711	0.714	Simple Seasonal Model
31	M.ED. Administration and Planning-Model_31	-0.004	0.391	-0.002	0.5	0.613	0.619	0.565	0.619	Holt Winters Additive Model
32	M.ED. Educational Technology-Model_32	-0.012	0.403	-0.001	0.51	0.638	0.651	0.604	0.651	Holt Winters Additive Model
33	M.ED. Science Education-Model_33	-0.019	0.401	-0.019	0.51	0.613	0.63	0.586	0.63	Holt Winters Additive Model
34	M.Sc. Mass Communication-Model_34	-0.003	0.427	-0.001	0.5	0.641	0.647	0.641	0.647	Holt Winters Additive Model
35	M.Sc. Information	-0.022	0.37	-0.022	0.51	0.566	0.585	0.544	0.585	Holt Winters Additive Model

	Technology-Model_35									
36	M.Sc. Peace Studies and Conflict Resolution-Model_36	-0.013	0.446	0.066	0.57	0.63	0.698	0.69	0.698	Holt Winters Additive Model
37	Masters in Public Administration-Model_37	-0.001	0.324	-0.001	0.5	0.568	0.569	0.6	0.6	Holt Winters Multiplicative Model
38	Masters in Business Administration-Model_38	-0.003	0.391	-0.003	0.5	0.613	0.615	0.62	0.62	Holt Winters Multiplicative Model
39	PGD. Agricultural Extension Management-Model_39	-0.002	0.384	-7.03E-06	0.51	0.611	0.614	0.605	0.614	Holt Winters Additive Model
40	PGD. Criminology and Security Studies-Model_40	-0.007	0.46	0.112	0.57	0.657	0.716	0.706	0.716	Holt Winters Additive Model
41	PGD. Education-Model_41	-0.072	0.48	0.024	0.55	0.603	0.667	0.63	0.667	Holt Winters Additive Model
42	PGD. Information	-0.023	0.379	-0.001	0.51	0.494	0.522	0.424	0.522	Holt Winters Additive Model

	Technology-Model_42									
43	PGD. Peace Studies and Conflict Resolution-Model_43	-0.013	0.363	0.006	0.52	0.498	0.51	0.373	0.515	Holt non seasonal Model
44	PGD. Business Administration-Model_44	-0.019	0.383	-0.019	0.56	0.536	0.55	0.535	0.555	Holt non seasonal Model
45	PGD. Public Administration-Model_45	-0.013	0.373	-0.006	0.5	0.569	0.583	0.568	0.583	Holt Winters Additive Model

Table 2: Models with best stationary R^2 Values

SN	Forecast model	No of cases	Percentage (%)
1	Holt Winters Additive model	25	55.55556
2	Holt Winters Multiplicative model	7	15.55556
3	Holt nonseasonal model	9	20
4	Simple Seasonal model	4	8.888889

Table 1 shows the stationary R^2 values obtained when the Simple non-Seasonal, Holt's non-Seasonal, Brown's Linear trend non-Seasonal, Damp Trend non-Seasonal, Simple Seasonal, Holt Winters Additive seasonal model and Holt Winters Multiplicative forecast models were tested on each of the programmes time series data. For each time series, the best forecast model was determined and recorded. This was done by comparing the stationary R^2 values obtained from each forecast model when applied on a single time series data and choosing the model with the highest positive stationary R^2 value. The stationary R^2 is a measure that compares the stationary part of the model to a simple mean model. A high positive stationary R^2 value implies that the model under consideration is better than the baseline model.

The overall performance of each forecast model was thereafter determined as shown in Table 2. Results showed that the Holt Winters Additive seasonal model produced the best stationary R^2 values in 55.6% of the sampled programmes, Holt Winters Multiplicative model produced the best stationary R^2 values in 15.6% of the sampled programmes, Holt nonseasonal model produced the best stationary R^2 values in 20% of the sampled programmes while Simple Seasonal model produced the best stationary R^2 values in 8.9% as shown in Table 2..

Table 3: comparing the MAPE values of the forecast models in cases where there were ties in stationary R^2 values

		Mean Absolute Percentage Error (MAPE)			
SN	Time Series (Programmes)	simple seasonal model	Holt Winters Additive	Holt Winters Multiplicative	Best method
1	B.A English	27.456	27.717	27.656	simple seasonal model
2	B.A French International Studies	95.308	93.696	125.326	Holt Winters Additive
3	B.Agric Agricultural Economics and Agro-Business	91.905	92.787	92.866	simple seasonal model
4	B.Sc.(ED) Agricultural Science	37.914	39.441	39.998	simple seasonal model
5	B.Sc. Maths and Computer Science	34.344	33.875	202.204	Holt Winters Additive
6	B.Sc. Tourism Studies	38.296	38.108	38.674	Holt Winters Additive

Table 3 shows six cases where two or more forecast models produce the same stationary R^2 values. Where two or more models produced same best stationary R^2 values, the Mean Absolute Percentage Error (MAPE) fit criteria was used to resolve the tie. The model with the lowest MAPE was chosen among the ties as shown in Table 3.

Table 4: Showing the MAE fit statistics of the four top models when applied on the 45-time series data

Forecast Model	Mean	SE	Min	Max	Percentile						
					5	10	25	50	75	90	95
HWA	105.745	152.755	2.934	672.073	4.282	6.413	14.514	45.639	136.996	351.552	546.132
HWM	119.226	171.341	2.984	789.485	4.295	7.059	16.824	58.142	146.122	405.257	568.22
HN	109.667	158.269	2.934	713.489	4.273	6.49	15.071	48.869	137.314	364.071	551.965
SS	106.057	155.36	2.954	677.746	4.259	6.356	14.456	44.842	143.263	343.166	563.767

Finally, the obtained Mean Absolute Error (MAE) values for the top four best performing models were recorded and compared as shown in Table 4 to validate our choice of the best model. The mean values of MAE shown in Table 4 are the average values of MAE when each of the four top models is used to forecast all the 45 sampled time series data. In addition to the MAE validation, a mean stationary R^2 of 0.583 and a very low standard error (SE) of 0.127 were obtained when Holt Winters additive model was tested on the entire 45 time series data. This shows a good performance of the Holt Winters Additive model on all the time series data. The Holt Winters additive model was therefore chosen as the best forecast model for forecasting students' enrolment into NOUN programmes.

Conclusion and Recommendations

Choosing an effective forecast method for multiple time series using traditional approach can be daunting and most times prone to errors if not carefully managed. The approach adopted in this research is simple and reliable while working with large number of correlated time series. Comparing numeric goodness-of-fit values for our 45 distinct time series data is no doubt easier and less prone to errors than using any other method to evaluate and compare such large number of time series data. The determination of Holt Winters Additive method as the best forecast model for future students' enrolment in NOUN implies that the enrolment pattern of NOUN displayed a relatively constant seasonality over time.

Accurate forecast of student population will have great implication on Course Material production and distribution planning, hiring of Facilitators, Examination booklets production planning and also help in income and expenditure projections in NOUN and other ODL institution with similar structure. Choosing an effective forecast model is the first and probably the most technical step in the series of activities leading to accurate forecast of students' enrolment into different programmes of NOUN. The results of this study will therefore be of great benefit to researchers, software developers and others non expert forecasters wishing to predict students' enrolment into NOUN programmes for several purposes. The chosen HWA

forecast model in this research was applied in Adoga et al. (2022 a,b) to determine the demand of course materials needed in a succeeding year and to develop a decision support system for Course Materials production and inventory management in NOUN.

It is therefore the recommendation of this study that to ensure accurate and reliable forecast of students' enrolment into various programmes of NOUN in future, the Management of NOUN and relevant stakeholders should employ the Holt Winters additive technique as it produced better goodness-of-fit values and generally performed better than other tested time series models.

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Appendix 1: Transcribe time series data of 25 of the 45 programmes for a period of 2004 -2019

Year	Public_Health_BSC	Early_Childhood_Edu_BA	French_Edu_BA	Primary_Education	English_Education	English_BA	French_International_Studies	Islamic_Studies_BA	Agric_Econs_and_Agro_Biz	Agric_extension_and_Rural_dev	Agricultural_Science_EDU	Biology_EDU	Chemistry_EDU	Integrated_Science_Edu	Mathematics_Education	Physics_EDU	Accounting_BSC	Computer_Science	Cooperative_Management	Criminology_and_Security_Studies	Entrepreneur_Business_Mgt	Environmental_studies_and_res_Mgt	Mass_Communication	Mathematics_BSC	Maths_and_Computer_Science
01-Jun-04	0	44	6	106	101	0	0	0	17	8	15	7	3	3	19	3	0	226	442	302	3	67	0	0	0
01-Dec-04	0	44	6	107	102	0	1	0	17	9	16	7	3	3	19	4	0	226	443	303	4	67	0	0	1
01-Jun-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01-Dec-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01-Jun-06	0	78	4	126	92	227	15	30	41	19	35	34	13	21	30	5	0	205	284	858	428	198	1	6	74
01-Dec-06	1	78	5	126	93	228	16	30	41	19	35	34	13	22	31	6	0	206	285	859	428	198	1	6	74
01-Jun-07	1	72	2	169	83	237	11	25	36	20	47	44	15	9	34	8	2	431	486	925	790	197	68	14	120
01-Dec-07	1	73	2	169	84	237	11	25	37	20	47	44	15	10	35	9	3	431	487	925	790	197	68	15	120
01-Jun-08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01-Dec-08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01-Jun-09	2	66	1	155	53	78	12	21	28	18	28	28	11	6	19	8	2	334	363	471	628	197	242	11	75
01-Dec-09	2	66	2	156	53	79	12	22	28	19	28	29	11	6	19	8	3	335	364	471	628	198	242	12	76
01-Jun-10	1	29	0	34	24	41	8	16	13	20	9	15	5	7	13	4	1	220	194	314	344	117	108	9	39
01-Dec-10	1	30	1	34	25	42	9	17	14	21	9	15	5	7	13	5	1	221	194	315	344	118	109	10	40
01-Jun-11	900	154	13	282	295	303	114	155	121	73	92	145	42	29	72	29	1046	1440	552	1607	2337	674	962	57	261
01-Dec-11	901	154	14	283	295	303	114	155	121	73	92	146	43	29	72	29	1047	1441	552	1608	2337	674	962	57	262
01-Jun-12	383	105	4	192	184	178	15	49	100	25	35	110	31	17	47	13	1566	1486	217	1100	2546	660	817	40	147
01-Dec-12	383	106	5	192	185	178	15	49	101	26	36	110	31	18	48	14	1567	1487	218	1101	2546	660	817	40	147
01-Jun-13	597	191	8	375	341	369	41	80	239	36	88	214	45	24	97	42	3607	3357	463	2232	6013	1566	1912	85	277
01-Dec-13	597	191	8	375	341	369	42	81	239	37	89	214	45	25	97	43	3607	3358	464	2233	6013	1567	1912	86	278
01-Jun-14	363	284	9	597	432	470	49	126	331	59	119	285	63	27	123	46	4443	4771	581	2926	7665	2227	2923	109	289
01-Dec-14	364	284	9	597	433	470	49	126	332	59	120	285	63	28	123	46	4444	4771	581	2926	7666	2227	2923	109	290
01-Jun-15	801	233	14	454	304	262	49	89	16	29	106	195	34	19	72	34	2528	2968	334	2126	4103	1679	1849	72	164
01-Dec-15	801	233	15	455	304	262	50	90	17	30	106	196	35	19	73	35	2529	2968	335	2127	4104	1679	1850	73	165
01-Jun-16	800	158	3	258	192	166	41	59	14	19	66	148	25	13	51	16	1288	1648	150	1284	1174	985	1137	33	91
01-Dec-16	801	159	4	258	192	166	42	59	14	20	66	148	26	14	51	17	1288	1648	150	1285	1174	985	1138	33	92
01-Jun-17	522	224	8	262	194	187	16	94	12	17	67	153	33	0	52	20	26	1621	411	1461	2776	834	1071	47	92
01-Dec-17	522	224	8	263	194	188	17	95	12	18	67	153	33	0	52	21	27	1622	412	1461	2777	835	1072	48	93
01-Jun-18	361	214	5	212	141	156	17	77	6	9	18	138	26	15	36	18	636	1264	31	1226	1079	566	871	42	56
01-Dec-18	361	214	5	213	141	156	18	78	7	10	18	138	26	16	37	18	636	1265	32	1227	1080	566	872	42	56
01-Jun-19	300	273	8	240	168	177	12	97	10	10	18	144	24	13	38	14	861	1346	41	1296	469	599	950	40	70
01-Dec-19	300	274	9	240	168	177	12	97	10	11	19	145	24	14	39	14	862	1346	41	1297	469	600	950	40	70

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e-Granary Electronic Library: A Panacea for Effective Low-Cost Means of Knowledge and Lecture Delivery for Distance Learning in the National Open University of Nigeria

Bibliothèque électronique E-Granary: Une panacée pour des moyens efficaces et peu coûteux de transmission de connaissances et de cours magistraux pour l'enseignement à distance à l'Université nationale ouverte du Nigeria

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Abstract

e-Learning is virtual learning process in which a learner stays in one place and explores as well as interacts with knowledge anywhere and at any time through electronic means. This e-learning is first choice for distance education. The electronic library also known as digital library, an online library, an Internet library, a digital repository, or a digital collection will be a great support to e- learning. This digital library embraces an online database of digital objects that can include text, still images, audio, video, digital documents, or other digital media formats to be accessible through the Internet. The accessibility of this information digitally in university libraries could be expensive. The remedy could be to embrace the use of the egranary Digital Libra ry which is an offline information store that provides instant access to digital resources for those lacking adequate Internet connections. A single e-Granary, connected to a wired or wireless local area network (LAN) helps to solve the situation. The research work investigates the concept of e-Granary Digital Library and its usefulness for developing distance education especially in the rural areas of Nigeria, features of e-Granary digital library, e-Granary Digital Library Implementation, benefits of e-Granary Digital Library to the development of distance

learning , steps for using digital library for executing distance learning education, importance of e-Granary Digital Library for the development of distance learning programmes and problems of e-Granary digital as a mode of lecture delivery, conclusion and recommendations were made.

Keywords: e-Learning, Wireless Local Area Network, distance learning, Cost effective, E-Granary digital library

Résumé

La formation en ligne est un processus d'apprentissage virtuel dans lequel l'apprenant reste à un endroit et explore et interagit avec la connaissance n'importe où et à n'importe quel moment par le biais de moyens électroniques. L'apprentissage en ligne est le premier choix pour l'enseignement à distance. La bibliothèque électronique, également connue sous le nom de bibliothèque numérique, bibliothèque en ligne, bibliothèque Internet, dépôt numérique ou collection numérique, sera d'un grand secours pour l'apprentissage en ligne. Cette bibliothèque numérique englobe une base de données en ligne d'objets numériques qui peuvent inclure du texte, des images fixes, de l'audio, de la vidéo, des documents numériques ou d'autres formats de médias numériques accessibles par l'intermédiaire de l'internet. L'accessibilité de ces informations sous forme numérique dans les bibliothèques universitaires pourrait s'avérer coûteuse. La solution pourrait être d'adopter l'utilisation de la bibliothèque numérique e-Granary, qui est un magasin d'information hors ligne offrant un accès instantané aux ressources numériques pour ceux qui ne disposent pas de connexions Internet adéquates. Le travail de recherche étudie le concept de bibliothèque numérique e-Granary et son utilité pour le développement de l'enseignement à distance, en particulier dans les zones rurales du Nigeria, les caractéristiques de la bibliothèque numérique e-Granary, la mise en œuvre de la bibliothèque numérique e-Granary, les avantages de la bibliothèque numérique e-Granary pour le développement de l'enseignement à distance, les étapes de l'utilisation de la bibliothèque numérique pour l'exécution de l'enseignement à distance, l'importance de la bibliothèque numérique e-Granary pour le développement du

programme d'enseignement à distance et les problèmes de la bibliothèque numérique e-Granary en tant que mode de transmission des cours, une conclusion et des recommandations ont été formulées..

Mots-clés : L'apprentissage à distance, le Réseau Local sans Fil, Les Etudes à Distance, la Rentabilité, Bibliothèque Numérique e-Grenier,

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Introduction

The need for e-Granary electronic libraries cannot be overstated to provide information and knowledge for human resources in all works of life. E-Granary's digital library is an external hard drive designed for users in low-income communities and also known as "Internet in a Box", The e-Granary Digital Library — "The Internet in a Box" — is an off-line information store that provides instant access to over 35 million digital resources for those lacking adequate Internet connections (Abifarin, 2004).

The e-Granary plays a basic role as an offline digital library that provides electronic library resources to the university. This can be accomplished by copying websites (with copyright permission) and sending them to intranet web servers inside the university, providing millions of documents that are instantly accessible over a local area network (LAN).There are other relevant websites available in the e-Granary. The e-Granary contains several databases on different academic subjects such as agriculture, computer science and mathematics. Others include e-journals, e-books, online tutorials, free software downloads, and more. The basic functions of the e-Granary digital library are known for using innovative offline storage technology to deliver millions of digital documents to schools, clinics, hospitals and homes in the developing countries with little or no Internet connection. It helps to provide users with instant access to a wide range of websites, audio, video and multimedia resources from the institution's local area network (LAN). The e-Granary digital library demonstrates a new, cost-effective way to provide global information and knowledge in poor areas.

e-Library (electronic library) is a synonym for virtual and digital libraries. The electronic library has been defined in different ways by different scholars, depending on their individual or organizational perspective. Issa, Jerry and Muhammed (2009) confirmed that the term electronic library is used as a synonym for digital, universal, future, community and library without walls. Nebeolise (2019), in his own perspective, refers to the digital library as an electronic library in which the collections are stored in electronic format such as CD-ROMs, flash drives, SD cards (as opposed to printed materials) and are used over computers. In addition, it states that the virtual library is an Internet-based digital library or libraries without walls. The content of a virtual library simply means that anyone with a computer and a connection to library networks can access not only the library's resources, but also a wide variety of information available over national and inter-national networks once the networks are available without being physically present in the library.

In fact, most of the academic libraries around the world including Nigeria are struggling with problems such as lack of funds to acquire needed information resources, subscribe to printed resources and even electronic resources and competent librarians adapted to the digital age. Software and hardware are another potential problem in the digital age in developing countries; others are the human resources to handle the technologies effectively and the instability of the electricity supply. The challenges occur in academic libraries in many countries and have great significance for the development of education in the nation (Omekwu, 2002).

In view of the above challenges, the provision of e-Granary digital libraries for distance learning is becoming very important as digital libraries provide access to information resources such as databases, e-journals, electronic-books (e-books), notification services, special collections and CD-ROMs, online reference works, and these improve the quality of teaching and research (Lee, 2008). Therefore, knowing the availability and use of these digital information resources (DIR) have become convenient for academic purposes. Since those looking for information are no longer satisfied with printed materials alone, only digital information remains in the digital age.

Digitisation improves access to library resources, and through the digitization of library holdings, information will be accessible to all and not to just a group of researchers. Digital projects enable users to quickly and comprehensively search collections anytime, anywhere. Digitisation makes visible what is invisible. Multiple users can access the same material at the same time without hindrance. It also eliminates the problem of distance since users do not have to travel to libraries that hold printed copies of library materials before they can access and use those materials.

Distance learning is gradually being recognised as an outstanding means of educating a large number of students in Nigeria recently. It's still a relatively cheap and easy way to house those who, for one reason or another, have dropped out of the school system. It is also a new tool to solve the yearly problem of traditional higher education institutions' inability to absorb large numbers of qualified candidates seeking a place in the relatively few places available in the country's higher education institutions (Abifarin, 2004).

Distance learning refers to a form of instructional delivery that does not require students to be physically present at the same location as the teacher (Steiner, 2002).In light of the above discussion; the researcher has found the importance of the e-Granary digital library for effective education for distance learning.

Many distance learning students are mainly seen in urban and rural areas in most countries around the world (Popoola, 2018). A case in point is National Open University of Nigeria (NOUN) students who can be found in every part of Nigeria where facilities such as web, Internet and other Internet facilities facilitate access to programmes in one way or another. Through a process of copying web sites (with permission) and putting them on the internal networks of our partner institutions, the e-Granary delivers instant access to a wide variety of educational resources including video, audio, books, journals, and websites.

The e-Granary is much more than just static information: the digital library contains built-in tools for subscribers to upload and edit local materials as well as create and edit their own websites, which are stored locally. A single e-Granary, connected to a wired or wireless local area network (LAN), can serve thousands of patrons and has been adopted by over 2,000 institutions. In support, Nwosu (2012) stated that the January 2009 survey on the web presence of 70 higher institutions in Nigeria found that 46 of Nigerian universities had an online web presence and 24 did not. Some universities have a significant web presence and a case in point is the National Open University of Nigeria, Abuja (NOUN). Nevertheless, there are still some hindrances altering the effective means of knowledge and lecture delivery for distance learning.

This problem could be better solved by finding other means to reach distance students in their different locations. The use of the e-Granary digital library represents an alternative solution that provides an appropriate solution to the problem created by the urban-rural dichotomy in Nigerian society.

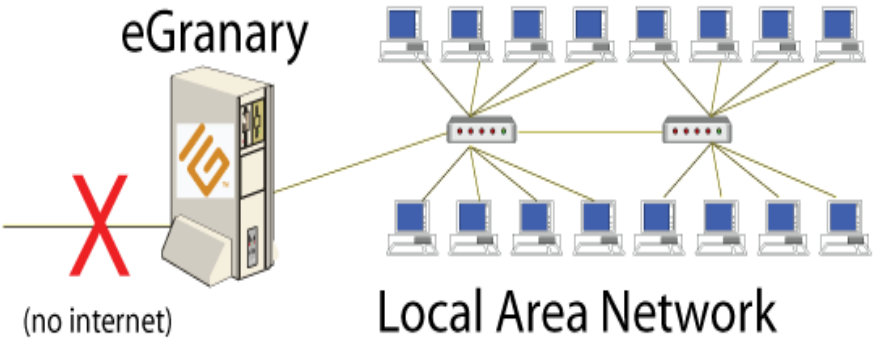
Concept of e-Granary Digital Library

The e-Granary Digital Library can be viewed as a mini Internet resource for various schools in developing countries without adequate Internet connections. It is a collective effort of hundreds of authors, publishers, programmers, librarians, teachers, and students from around the world (Abifarin, 2010). The e-Granary Digital Library is also the Internet in a box and an offline information store, providing instant access to over 35 million digital resources for those without a sufficient Internet connection Purbo (2020). A single e-Granary connected to a wired or wireless local area network (LAN) can serve thousands of customers.

An e-Granary digital library stores educational resources over a local network to reduce connection costs in areas with poor Internet access. Most e-Granary subscribers don't have an Internet connection, but

those who do can open resources from e-Granary Digital library up to 5,000 times faster than an ordinary library with Internet connection.

A large number of students in the developing world have little or no access to the Internet and its wealth of educational resources (Wright, Dhanarajan and Reju, 2009). The e-Granary digital library offers more than 30 million educational resources over a local network without Internet access. For countries with low literacy rates, high Internet access costs, and other barriers that hinder students and educators, this "Internet in a Box" helps close the gap between Internet usage in developed and developing countries.



A Diagrammatic representation of e-Granary

E-Granary is an offline server hosting millions of websites, videos, tutorials and software programs accessed from computers, tablets and smart phones over a local area network (LAN). This "Internet in a Box" works and feels just like the Internet, but is thousands of times faster over the LAN and completely secure. By copying websites (with permission) and localizing them on the internal networks of our partner institutions-Granary provides instant access to a wide variety of educational resources including video, audio, books, magazines and websites covering dozens of subjects ranging from engineering and medicine to horticulture and music. Over 35 million resources hosted on e-Granary are fully indexed and searchable with our powerful built-in search engine. In addition, users can upload their own content and

create or edit tons of websites using integrated software called Community Information Platform.

Features of e-Granary digital library

The e-Granary possesses some features or characters and are as follows-:

- No Physical Restriction
- Multiple Access
- Easy-to-Use
- Conservation and Preservation
- No Limitation of Space
- Scope of Improvement
- More Than a Library
- Not Time-Bound

Benefits of e-Granary Digital Library

The e-Granary digital library performs many roles and some of the benefits are-:

i. The e-Granary digital library supports quick access to educational materials, including video, audio, books, magazines and websites, even when there is no Internet access (Wider Net Project (2001).

ii. The e-Granary digital library makes millions of digital educational resources available to institutions that do not have adequate access to the Internet (Wider Net (2010)

iii. e-Granary helps copy websites and submits them to Internet web services INSIDE their respective institutions in developing countries through a permission-seeking process.

iv. e-Granary Digital Library provides millions of multimedia documents that users can instantly access local area networks (LAN) free of charge

v. In developing countries, the E-Granary digital library helps bring millions of Internet resources to institutions that do not have adequate Internet access by copying and submitting websites to Internet web servers in partner institutions.

vi. The e-Granary Digital Library provides educational materials for instant access over local area networks (LANs).
vii. The e-Granary Digital Library provides those who do not have adequate Internet access with an offline access link to approximately 14 million educational resources and more than 1,200 websites and hundreds of CD-ROMs.
viii. The e-Granary digital library has collections totaling more than 50,000 books, hundreds of full-text journals and dozens of software applications (Wikipedia, 2010).

Steps for Lecture Delivery to the Rural Based Distance Learning Students through e-Granary Digital Library

- Establishment of Study Centers in the Rural Areas: The study centers could be located in the local government headquarters or in the district headquarters. These study centers should be well equipped with all the necessary facilities that will enable the e-Granary Digital Library function well. It is important that computer laboratories or cybercafés are provided to house the e-Granary Digital Library equipment. There is the need to provide comfortable seats to the students and technical officers handling the digital library. Should in case the centers are not connected to the national grid, it will be advisable to power the centers with generating plants.

- Availability of Course Materials Online: The distance learning facilitators should ensure that course materials for all courses offered by them are placed on the websites. The students in the urban areas can make use of the course materials directly from the net while the same materials are copied into e-Granary hard drive and added to the existing servers in the study centers for every distance learning student on the Local Area Network (LANs) to have fast and free access. Each of the study centers should be provided with separate e-Granary Digital Library equipment and facilities to operate on.

- Computer Literacy Training Programme: The students should be prepared for the utilisation of the e-Granary Digital Library.

The distance learning operators have to organize computer literacy training programme for their rural students most especially some of them that are not computer literate. After this training, the training for utilisation of the e-Granary Digital Library should follow. The students have to be trained on skills for accessing information online. This training will enable the distance learning students to cope with the use of the new e-Granary Digital Library technologies for their academic work adequately.

- Experiment on the Use of e-Granary Digital Library: The students should be encouraged to carry out practical on the use of e-Granary Digital Library personally. This is to enable them to be familiar with challenges they may encounter in the course of using the digital library. It is after they have mastered the use of e-Granary Digital Library that the students can be allowed to use the facilities on their own without much supervision.

- Installation of e-Granary Digital Library for their Collective Usage: A good number of students or wealthy students can come together with the sole aim of installing e-Granary Digital Library for their collective usage. This is because the cost of installing e-Granary Digital Library is relatively low compared with Internet installation. Therefore, in some rural study centers, the students can also contribute money for the installation of e-Granary Digital Library. The distance learning institutions can equally appeal to the federal, state and local governments, non-governmental organisations, telecommunication companies and other philanthropists to assist them in providing e-Granary Digital Library in their rural study centers for their students' usage.

- The Advantage of e-Granary Digital Library with the Online Facilitators: The distance learning facilitators in Nigeria together with distance learning institute of various universities and the national open university of Nigeria (noun) are suggested to embody the possibilities embedded with inside the

use of e-Granary virtual library to reach their students most especially those in the rural areas of the country.

Importance of e-Granary Digital Library to the Development of Distance Learning Programme

i. The use of e-Granary digital library, especially in the rural areas provides opportunity for the rural based students to develop and improve their basic Internet access skills.

ii. The e-Granary digital library makes available to the students or its users the very rich collections of works or information from varieties of authors, publishers, programmers, librarians, instructors and other authorities wherever they may reside most especially areas without Internet connectivity.

iii. e-Granary digital library is serving the purpose of bringing the Internet to the door steps of the users especially in the rural areas. This is because with e-Granary digital library. There is no problem of bandwidth cost which is always very high in the developing countries and great impediment to the provision of Internet connectivity in many countries in the developing world.

iv. It is equally a good alternative to the users in countryside who do not have access to information on the Internet. The e-Granary digital library affords them the opportunity to have access to very rich materials that are copied from the Internet.

v. e-Granary digital library provides cheap academic materials to the users especially schools in the developing countries that cannot afford to spend millions of dollars for their Internet connectivity.

vi. e-Granary digital library focus is to install the library in thousands of sites around the world. The multiplier effect of this is that, many students including those in the rural areas across the globe will have access to a lot of information on the Internet especially academic work through the e-Granary digital library.

vii. The inventions of e-Granary digital library according to Abifarin (2010) is an advantage to the distance learning students most of whom are based in the rural areas where Internet connectivity is not available, he asserted that what is required is just for the management of such distance learning programme to install e-Granary digital library in their various study centers where Internet services is not available for the use of their students.

viii. e-Granary digital library provides up-to-date and very recent academic information to their users based on the constant review of the contents from time to time. This is done through the use of WiderNet project staff and volunteers who work round the year to improve and increased the academic work or content collection of the e-Granary.

ix. e-Granary digital library is cost effective especially when one compared the money spent on its installation with the numbers of users it serves. For instance, Abifarin (2010) asserted that "to install e-Granary digital library may cost less than one million naira in a university or other tertiary institutions. But the number of students and other users it will serve overshoot the cost of installation".

Problems to e-Granary Digital Library as a Mode of Lecture Delivery

- **Power Failure:** Power failure stand out as one of the great problem in the use of e-Granary digital library. Irrespective of the great advantages of the use of e-Granary digital library to distance learning programme, most rural areas are still not connected to the national grid for electricity supply which is a major impediment to the use of e-Granary digital library.

- **Funds:** e-Granary digital library is a newly developed learning technology. Therefore, enough funds will be needed to install the e-Granary digital library which most rural populace may not be able to afford despite its relatively low cost when compared

to Internet connectivity. Enough funds are also required for recruiting staff for the library and for maintain the facilities of the e-Granary digital library. Time should also be allotted to train the users on the basic skills for effective use of the equipment.

- **Insufficiency of Course Materials:** Notwithstanding, the richness of the materials in the e-Granary digital library, still its contents cannot be compared with what the Internet has. Stressing on this, some downloaded materials from the Internet may not be sufficiently enough for the academic needs of the students when compared with the Internet content that are updated on regular basis.

Conclusion

The invention of e-Granary digital library could be an immense advantage to development of education in the developing countries of the world. The problem is how e-Granary can be promoted in the University libraries and in the main, National Open University of Nigeria library. This is to ensure that both faculty and students adopt the cheapest e-learning in using the electronic digital library that is most suitable for the realisation of education and the goal of their prestigious institution. The area of education is being fortified regularly with new training technologies. E-Granary digital library is one of such innovations. The invention of e-Granary digital library is no doubt a major development in the art of teaching and learning. It is also a great contribution to the development of distance learning especially when consideration is given to adequate contact of the distance learning students in the rural areas. The e-Granary digital library should therefore be embraced by all distance learning institutions for better geographical coverage of their programmes.

Recommendations

1. The federal, state and local governments should make available e-Granary digital library to all the schools lacking Internet connectivity in Nigeria.
2. The NOUN management should try to implement e-Granary digital libraries in the institution to ensure that all facilitators and students deliver their lectures and receive their lectures and other information respectively.
3. The National Universities Commission (NUC), non-governmental associations and other philanthropists should also assist the schools by assisting the schools and other tertiary institutions with Internet connectivity or at least the e-Granary digital library.
4. Experts should be engaged to train the teachers in different levels of education for adequate utilisation of e-Granary digital library new teaching technology.
5. Adequate and continuous training programme should be conducted in schools on Internet skills acquisition for both the staff and the students to enable them benefit adequately from the new training technologies in the classroom.
6. Adequate maintenance should be given to the e-Granary digital library equipment in order to enable it serve the users for a long time.

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Perceptions of Teachers and Students On the Use of Interactive Learning Instructional Package (ILIP) in Nigeria Senior Secondary Schools in Ondo State, Nigeria

Perceptions des enseignants et des élèves sur l'utilisation de kit d'apprentissage interactif (ILIP) dans les écoles secondaires supérieures de l'État d'Ondo, au Nigeria

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Abstract

This study investigated the perception of teachers and students on the use of Interactive Learning Instructional Package (ILIP) in Nigeria senior secondary schools in Akoko South West Local Government Area, Ondo State. Two research questions were formulated to reveal the perception of teachers and students on the use of ILIP. A purposive sampling method was employed to select 150 participants for the study (100 students and 50 teachers). Questionnaire on Students' Perception in ILIP (QSPILIP) and Questionnaire on Teachers' Perception in ILIP (QTPILIP) was developed by researchers and validated by educators; they were used for data collection. QTPILIP and QSPILIP were built with Google Forms and the link was distributed to the respondents online via social media community; WhatsApp specifically. The instruments were found reliable at r = 0.73 and r = 0.75, using

Cronbach alpha coefficient, respectively. Descriptive statistics were deployed to analyze the research questions using frequency counts, percentages and bar charts. The results of the study revealed that both students and teachers have a positive perception of ILIP innovation in teaching BASIC programming as 94% of teachers and students agree that ILIP is important to teach and learning BASIC in schools. There are many possible setbacks that might hinder the use of ILIP in the future such as epileptic power supply, lack of ICT facilities and insufficient time allocation for computer studies on school's timetable etc. Findings revealed that ILIP as an instrument was found more interesting, interactive and engaging in relating BASIC rules and procedures to assist students in mastering learning programming contents at their own pace. Hence, ILIP is found to be effective in developing and improving students' academic achievement in BASIC programming in schools. The research recommended that government should provide well-equipped computer laboratories and power supply in public senior secondary schools to facilitate the effective use of ILIP tool to teach BASIC programming.

Keywords: Instructional package, Programming Language, Perception.

Résumé

Cette étude a examiné la perception des enseignants et des élèves sur l'utilisation du kit d'apprentissage interactif (Interactive Learning Instructional Package - ILIP) dans les écoles secondaires supérieures du Nigeria dans la zone de gouvernement local d'Akoko Sud-Ouest, dans l'État d'Ondo. Deux questions de recherche ont été formulées pour révéler la perception des enseignants et des élèves sur l'utilisation de l'ILIP. Un échantillonnage raisonné a été utilisé pour sélectionner 150 participants à l'étude (100 élèves et 50 enseignants). Le questionnaire sur la perception de l'ILIP par les élèves (QSPILIP) et le questionnaire sur la perception de l'ILIP par les enseignants (QTPILIP) ont été élaborés par les chercheurs et validés par les éducateurs ; ils ont été utilisés pour la collecte des données. Le QTPILIP et le QSPILIP ont été élaborés à l'aide de Google Forms et le lien a été distribué aux répondants en ligne par l'intermédiaire de la

communauté des médias sociaux, en particulier WhatsApp. Les instruments ont été jugés fiables à r = 0,73 et r = 0,75, en utilisant le coefficient alpha de Cronbach, respectivement. Des statistiques descriptives ont été utilisées pour analyser les questions de recherche à l'aide de comptes de fréquence, de pourcentages et de diagrammes à barres. Les résultats de l'étude ont révélé que les élèves et les enseignants ont une perception positive de l'innovation de l'ILIP dans l'enseignement de la programmation BASIC, puisque 94 % des enseignants et des élèves reconnaissent que l'ILIP est important pour l'enseignement et l'apprentissage de la programmation BASIC dans les écoles. De nombreux obstacles pourraient entraver l'utilisation de l'ILIP à l'avenir, tels que l'épilepsie de l'alimentation électrique, le manque d'équipements TIC et l'insuffisance du temps alloué aux études informatiques dans l'emploi du temps de l'école, etc. Les résultats ont révélé que l'ILIP, en tant qu'instrument, a été jugé plus intéressant, interactif et engageant dans la transmission des règles et procédures BASIC pour aider les élèves à maîtriser les contenus de programmation à leur propre rythme. L'ILIP s'est donc avéré efficace pour développer et améliorer les résultats scolaires des élèves en programmation BASIC dans les écoles. L'étude recommande au gouvernement de fournir des laboratoires informatiques bien équipés et une alimentation électrique dans les écoles secondaires supérieures publiques afin de faciliter l'utilisation efficace de l'outil ILIP pour enseigner la programmation BASIC.

Mots-clés : Kit pédagogique, langage de programmation, perception.

Introduction

Information and communication technology (ICT) is a tool that has tremendously transformed many sectors and has affected the way people work, think, and live. It plays a massive role in many disciplines like architecture, business, law, medicine, banking, engineering, tourism, travel, and education. In education, computer among other ICT gadgets is used to design instructional packages for teaching and learning, lesson delivery, creation of e-books, registration of entrance examinations, and examination grading. These gadgets are also used to keep students' records and make learning more interactive. Based on the immense and immeasurable impact of computers on education, several nations across the globe incorporated computer studies into their educational system at all levels (primary, secondary, and tertiary levels) to empower their young ones and the next generation to meet international standards.

In 1987, Nigeria adopted computer studies into secondary schools' curriculum so that students can catch up with the increasing trends in technology (FGN, 2004). In order to achieve this innovation, Beginners' All-purpose Symbolic Instruction Code (BASIC) programming was included as part of the topic to be learned by the students undergoing training in the subject. It is aimed at developing problem-solving skills in these learners. According to David (2013), the programming language is defined as a vocabulary or a set of grammatical rules for instructing a computer to perform specific tasks. It is designed to communicate instructions to a machine, particularly a computer. It can be used to create programs to control the behavior of a machine or to express algorithms. Acquisition of programming skills, therefore, has been described as a vital instrument for developing problem-solving skills (Ambrosio, Costa, and Franco, 2011), higher-order thinking skills (Fessakis et al., 2013) and creative thinking skills in the individual (Gao, 2011). Programming necessitates the acquisition and thorough knowledge of various rules by the student, including semantic and syntactic knowledge (Chen and Du, 2012) as well as coding and algorithmic knowledge (Govender, 2009). Coding is a skill that involves the typing of rigid syntactic rules and, whilst acquiring this skill, students often make errors. BASIC occupies a

central position in the teaching and learning of computer programming at the Secondary Schools level where computer education is offered (Olelewe, 2009).

It is unfortunate that students at the secondary school level invariably find it difficult to understand some of these concepts. Ogundele and Ajobiewe (2020) revealed that many students find programming difficult and disheartening at the secondary school level in Nigeria. Since BASIC programming is the basic skill required of computer programmers or computer science students, the negative impact of a solid background in BASIC may be harmful consequences on the learner's attitude towards programming. Computer programming especially BASIC programming requires a higher level of knowledge, it includes the need for meta-cognitive skills, such as understanding "When" and "Why" certain tasks are needed. This can be difficult for students to grasp; as multiple studies have shown.

Various studies (Gomes and Mendes, 2007; Govender, 2009) have confirmed that learning to program is considered hard work which is sometimes boring and often difficult to grasp. Lack of understanding and high levels of abstract teaching of programming (Koulouri, Lauria, and Macredie, 2015; Bergersen and Gustafsson, 2015), gender and mathematics knowledge (Lau and Yuen, 2010; Sullivan and Bers, 2016; Yurdugül and Aşkar, 2013), problem-solving skills (Yurdugül and Aşkar, 2013) as well as programming inexperience (Jegede, 2009), the idiosyncratic nature and complex syntax of programming (Altadmri and Brown, 2015; Topalli and Cagiltay, 2018) have been affirmed as the factors contributing to students' difficulties in learning BASIC programming.

There are gaps or deficiencies in students' knowledge of computer programming in each phase of the programming processes; the lack of skills in analyzing problems, ineffective use of problem representation techniques for problem-solving, ineffective use of teaching strategies for problem-solving and coding, the difficulty in mastering programming syntaxes and functions, and unavailability of adequate materials were the identified problems (Ogundele and Ajobiewe, 2020). Effects of these difficulties highly contribute to students'

repeated failure, and loss of interest in programming (Law, Lee, and Yu, 2010; Tan, Ting, and Ling, 2009). This problem calls for immediate attention because the nature of this topic has made it difficult for students to comprehend when taught in a traditional classroom setting (Gomes and Mendel, 2007).

Therefore, there is a need to incorporate teaching methods that will introduce the reality of concepts into the learning environments. BASIC programming requires the application of different techniques to teach it effectively and to make it interesting and meaningful (Olelewe, 2009). Muhammad and Fadzlliyati (2010) suggested that teachers need to engage the students in an experiential learning environment so that they are able to experience learning with some level of enjoyment. Munawaroh (2015) opined that organized quality interactive learning which is inspiring, fun, and challenging, motivates the students to actively participate in the teaching process and provides enough space for innovation, creativity and independence according to their talents, interests and physical and psychological development of students. The use of Interactive Learning Method activates the student's cognitive self-reliance (striving and being able to think critically and independently, being able to find pathways in a new situation, express thoughts in clearer ways, easy-to-understand, and concise manner, come up with an approach of his/her own to resolving an issue and be willing to help others enrich their array of competencies – Samal et al, 2016).

An instructional package is a solution for learning needs and problems, it is used to simplify learning for the user (Alshahad, 2018). It makes the learning process engaging and increases students' motivation toward the concept/subject; as well as increases students' achievement. Interactive learning modules can be used in the classroom environment for effective learning (Goldee, 2012).

Many findings have found that Interactive Learning Instructional Packages are effective and suitable in teaching BASIC programming in other fields like economics, mathematics etc. Akinyemi and Ologunada (2022) revealed that Interactive Learning Instructional Package has a more significant beneficial influence on the learners of

BASIC programming than the conventional lecture method. Its usage does not discriminate against genders in academic achievement. Students who were taught arithmetic progression with computer-assisted instructional packages achieved a higher score than those with the lecture method (Koni, Zephaniah and Okoro, 2019). Students taught using the simulation method achieved higher than those taught with the traditional method (Odo, 2016). The web-Quest package influenced students' performance levels because a large number of students performed better (Babatunde, Chukwuemeka and Godwin, 2020).

Perception can be defined as the process of interpreting sensory information in order to form a meaningful experience of the world. It describes the process of gaining an understanding or awareness of something through the use of the five senses. Perception is an important factor to consider in this finding. Perception is affected by the way information is presented, which can ultimately determine the level of acceptance and interaction with the material. Studies conducted (Adebayo 2008 and Ogunsumi 2015) found that students had more positive perceptions of interactive learning instructional packages when presented in an engaging way. Teacher perceptions also vary. Oluwole and Oluji (2014) found that teachers often lack confidence in their ability to use and effectively incorporate interactive learning instructional packages into their teaching. However, they also found that teachers often lack confidence in their ability to use and effectively incorporate interactive learning instructional packages into their teaching.

Therefore, it is essential to understand the various perceptions associated with the use of interactive learning instructional packages, as they can have a significant effect on the level of student engagement and success. Hence, this research focused on investigating the perception of teachers and students on the use of Interactive Learning Instructional Package (ILIP) and its challenges in Nigerian senior secondary schools in Akoko South West LGA.

Research Questions

1. What are the perceptions of teachers and students on the use of Interactive Learning Instructional Package (ILIP) in secondary school?
2. What are the possible challenges that Nigerian teachers and students will face in using Interactive Learning Instructional Package (ILIP) in the classroom?

Theoretical Framework

Learning theories depict how learning takes place among human being and animals. Selection of any of the learning theories by the teacher of computer has great influences on the instruction. Learning theories that was applicable to this study which are in agreement with theories suggested by Olelewe (2009) in teaching and learning of computer programming are: Connectionism, Gestalt Learning and Cognitive Flexibility.

Connectionism proposes that learning is a process of forming simple associative connections between stimuli and responses. In this context, perception of teachers and students in the use of interactive learning instructional package in Nigeria Senior Secondary School could be understood in terms of the activation of specific connectionist networks through the presentation of stimuli, such as the interactive learning package and the student's response to it. Through repeated exposure, a student's response to the instructional package can be modified, eventually leading to a change in their perception. Ultimately, this could lead to a positive attitude towards the use of the package.

Gestalt Learning is a cognitive theory that suggests that individuals learn best when they are able to form meaningful patterns out of related items. It is essential for students to be able to identify the part-whole relationships between objects and concepts in order to acquire meaningful knowledge. In this study, Gestalt learning could help teachers and students in the use of interactive learning instructional package in Nigeria Senior Secondary Schools by helping them to make

meaningful connections between concepts and objects within the package, thus allowing them to learn more effectively.

Cognitive Flexibility is the ability to switch between different perspectives or tasks when engaging in problem-solving or learning. In the context of this study, cognitive flexibility would refer to the ability of both teachers and students to recognise different approaches to using the interactive learning instructional package in Nigeria Senior Secondary School. This could include the ability to switch between different learning strategies, consider different perspectives, and recognise the impact of the instructional package on different types of learners.

Methodology

The research design adopted for the study was survey research design. Purposive sampling technique was employed to select participants (100 students and 50 teachers) from Government Senior Secondary Schools in Akoko South West Local Government Area of Ondo State. The schools selected were those who offered Computer Studies, had well-equipped computer laboratory, electricity/generator and were willing to participate.

The instrument "Interactive Learning Instructional Package (ILIP)" was developed by the researchers which serve as treatment to the students. This package was developed with authoring tool called Articulate Storyline version 3. The course contents were articulated and published for students' consumption. The students have access to the instruction through a mouse click on the package and it launch through any browser a learner chooses to use. ILIP can be published on Learning Management System (LMS) through which students can access the package anywhere, anytime over internet. That means ILIP can be accessed offline and online by the users. The package is cross-platform accessible; that is its contents can be accessed on any internet-based devices.

Questionnaire on students' perception on ILIP (QSPILIP) and questionnaire on teachers' perception on ILIP (QTPILIP) were

developed by the researchers and validated by educators; they were used to gather data on the perception of students and teachers on the use of Interactive Learning Instructional Package (ILIP) and its future possible challenges.

QTPILIP and QSPILIP were built with Google Form and the links were distributed to the respondents online via social media community; WhatsApp specifically. The instruments were found reliable at r = 0.73 and r = 0.75 using Cronbach alpha coefficient, respectively**.** Descriptive statistics using frequency counts, percentage and bar charts were used to analyze the research questions.

Results

Analysis of Research Questions

Research Question 1: What is the perception of teachers and students on the use of ILIP in secondary schools?

Table 1.1: Perception of students on the use of ILIP in secondary schools

S/N	ITEMS	Students (100)				
		SA	A	D	SD	Remarks
1.	ILIP is good for BASIC programming	60 (60%)	34 (34%)	4 (4%)	2 (2%)	**Agreed**
2.	ILIP is important for students in learning BASIC programming in schools than conventional method	51 (51%)	43 (43%)	4 (4%)	2 (2%)	**Agreed**
3.	The use of ILIP is time consuming/inefficient	7 (7%)	4 (4%)	48 (48%)	41 (41%)	**Disagreed**
4.	Students can easily learn programming skills effectively via ILIP	64 (64%)	28 (28%)	5 (5%)	3 (3%)	**Agreed**
5.	ILIP is very interactive	62 (62%)	31 (31%)	6 (6%)	1 (1%)	**Agreed**
6.	ILIP is easier to access without special training	65 (65%)	30 (30%)	3 (3%)	2 (2%)	**Agreed**
7.	It is easy to navigate through the ILIP environment	56 (56%)	36 (36%)	3 (3%)	5 (5%)	**Agreed**

8.	The use of ILIP can increase the interest of students toward learning programming BASIC programming	61 (61%)	31 (31%)	3 (3%)	5 (5%)	**Agreed**
9.	The use of ILIP can make the students more productive	61 (61%)	32 (32%)	5 (5%)	2 (2%)	**Agreed**
10.	Students can actively pursue learning new and advanced programming language in higher institution after using ILIP	45 (45%)	47 (47%)	6 (6%)	2 (2%)	**Agreed**
11.	The developer of ILIP knows the knowledge of BASIC programming very well.	61 (61%)	33 (33%)	5 (5%)	1 (1%)	**Agreed**
12.	Students get my programming tasks done quickly with ILIP	52 (52%)	43 (43%)	3 (3%)	2 (2%)	**Agreed**
13.	ILIP is tasking	53 (53%)	39 (39%)	7 (7%)	1 (1%)	**Agreed**
14.	ILIP enhances interaction among students	54 (54%)	38 (38%)	4 (4%)	4 (4%)	**Agreed**
15.	Students concentrate more on learning activities in ILIP	49 (49%)	43 (43%)	4 (4%)	4 (4%)	**Agreed**
16.	ILIP makes learners lose control over the learning process	7 (7%)	4 (4%)	59 (59%)	30 (30%)	**Disagreed**
17.	ILIP increases students' academic achievements	67 (67%)	25 (25%)	7 (7%)	1 (1%)	**Agreed**

Table 1.1 revealed that the perception of students on the use of Interactive Learning Instructional Package (ILIP) and how it can impact effective learning of BASIC was largely positive. It indicated that all the items were positively worded with higher percentage acceptance. The findings revealed both students agreed that the use of ILIP is important to teaching and learning of BASIC programming.

Figure 1.1 showed the clustered bar chart to represent data collected on the perception of students on the use of ILIP to teach BASIC programming. The chart is to make easy understanding of the results.

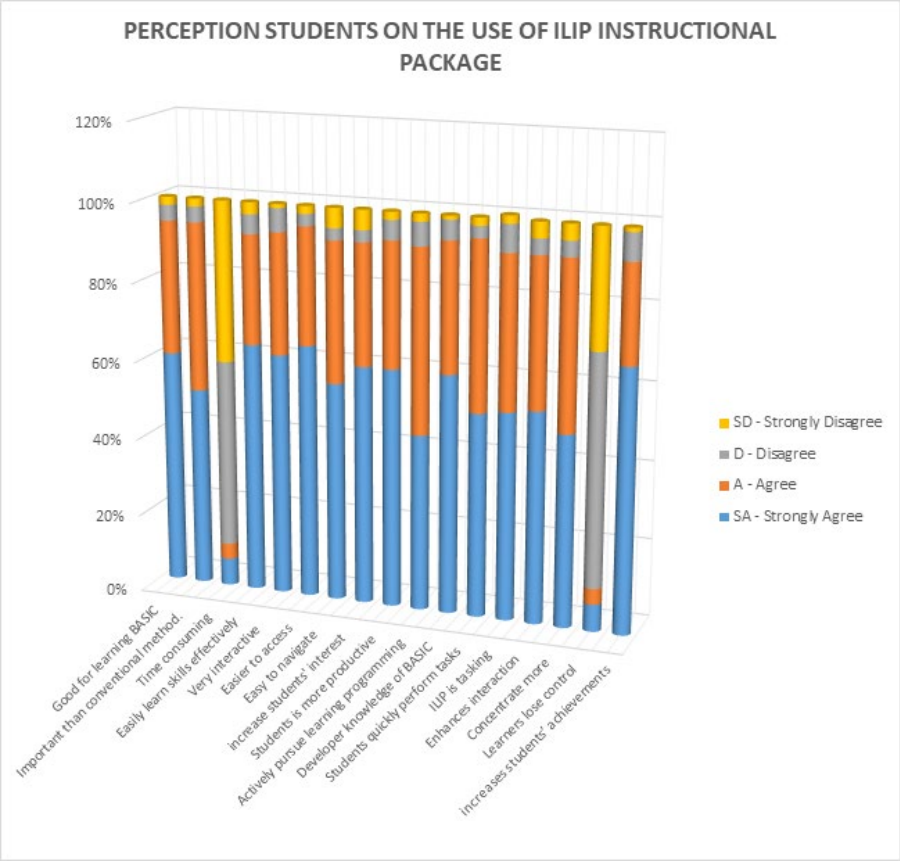


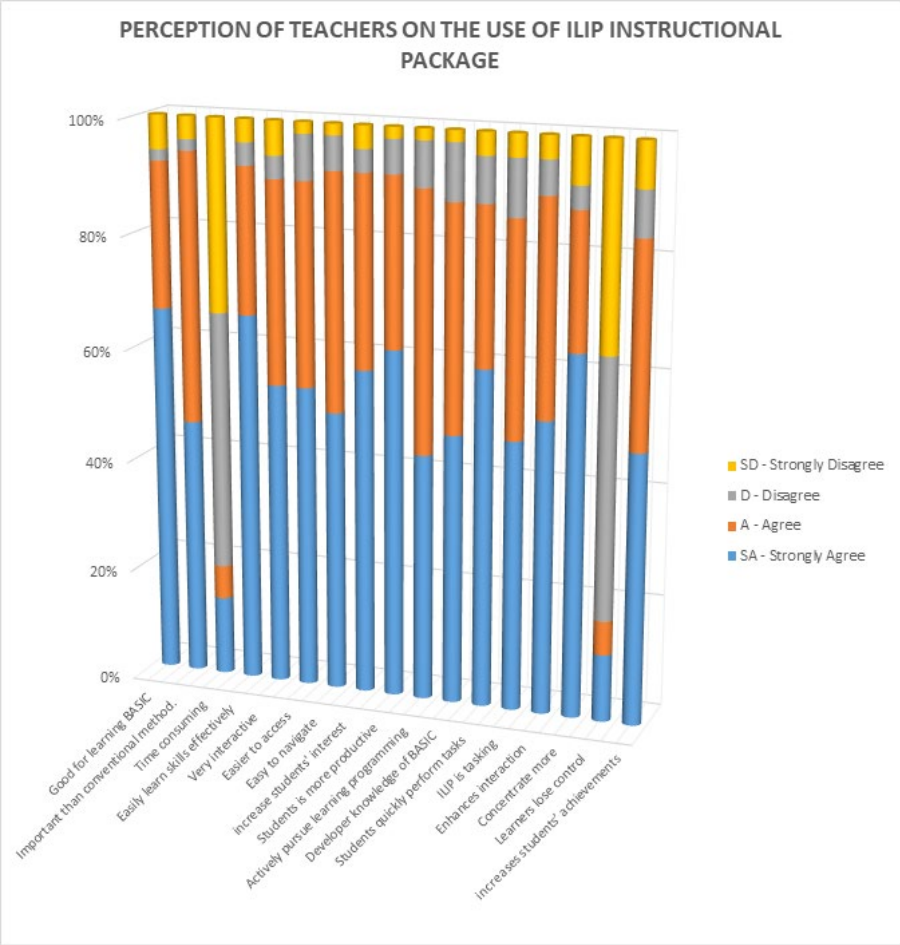
Table 1.2: Perception of teachers on the use of ILIP in secondary school

S/N	ITEMS	Teachers				
		SA	A	D	SD	Remarks
1.	ILIP is good for learning BASIC programming	33 (66%)	13 (26%)	1 (2%)	3 (6%)	**Agreed**
2.	ILIP is important for students in learning BASIC programming in schools than conventional method	23 (46%)	24 (48%)	1 (2%)	2 (4%)	**Agreed**
3.	The use of ILIP is time consuming/inefficient	7 (14%)	3 (6%)	23 (46%)	17 (34%)	**Disagreed**
4.	Students can easily learn programming skills effectively via ILIP	33 (66%)	13 (26%)	2 (4%)	2 (4%)	**Agreed**
5.	ILIP is very interactive	27 (54%)	18 (36%)	2 (4%)	3 (6%)	**Agreed**
6.	ILIP is easier to access without special training	27 (54%)	18 (36%)	4 (8%)	1 (2%)	**Agreed**
7.	It is easy to navigate through the ILIP environment	25 (50%)	21 (42%)	3 (6%)	1 (2%)	**Agreed**
8.	The use of ILIP can increase the interest of students toward learning BASIC programming	29 (58%)	17 (34%)	2 (4%)	2 (4%)	**Agreed**
9.	The use of ILIP can make the students more productive	31 (62%)	15 (30%)	3 (6%)	1 (2%)	**Agreed**
10.	Students can actively pursue learning new and advance programming language in higher institution after using ILIP	22 (44%)	23 (46%)	4 (8%)	1 (2%)	**Agreed**
11.	The developer of ILIP knows the knowledge of BASIC programming very well.	24 (48%)	20 (40%)	5 (10%)	1 (2%)	**Agreed**
12.	Students get my programming tasks done quickly with ILIP	30 (60%)	14 (28%)	4 (8%)	2 (4%)	**Agreed**

13.	ILIP is tasking	24 (48%)	19 (38%)	5 (10%)	2 (4%)	**Agreed**
14.	ILIP enhances interaction among students	26 (52%)	19 (38%)	3 (6%)	2 (4%)	**Agreed**
15.	Students concentrate more on learning activities in ILIP	32 (64%)	12 (24%)	2 (4%)	4 (8%)	**Agreed**
16.	ILIP makes learners lose control over the learning process	6 (12%)	3 (6%)	23 (46%)	18 (36%)	**Disagreed**
17.	ILIP increases students' academic achievements	24 (48%)	18 (36%)	4 (8%)	4 (8%)	**Agreed**

Table 1.2 revealed the perception of teachers on the use of Interactive Learning Instructional Package (ILIP) and how it can impact effective learning of BASIC. It indicated that all the items are positively worded with higher percentage acceptance. The findings revealed both teachers agreed that the use of ILIP is important to teaching and learning of BASIC programming.

Figure 1.2 below showed the clustered bar chart to represent data collected on the perception of teachers on the use of ILIP to teach BASIC programming. The chart is to make easy understanding of the results.



Research Question 2: What challenges will students and teachers face in using ILIP in classroom in the future?

Table 2.1: Challenges that students and teachers will face in using ILIP in classroom in the future

S/N	ITEMS	Students (100)			Teachers (50)		
		Yes	No	Remarks	Yes	No	Remarks
1.	Insufficient time allocation for computer studies in school's timetable	93 (93%)	7 (7%)	Yes	47 (94%)	3 (6%)	Yes
2.	Shortage of computer such as laptop and desktop	91 (91%)	9 (9%)	Yes	46 (92%)	4 (8%)	Yes
3.	Epileptic or lack of power supply	95 (95%)	5 (5%)	Yes	45 (90%)	5 (10%)	Yes
4.	Lack of students' interest in using ILIP	69 (69%)	31 (31%)	Yes	27 (54%)	23 (46%)	Yes
5.	Lack of computer laboratory, seminar room or audio-visual room	87 (87%)	13 (13%)	Yes	47 (94%)	3 (6%)	Yes
6.	Inefficient number of media (Projector, UPS, Mouse etc.) for effective use of computer to access ILIP platform	73 (73%)	27 (27%)	Yes	27 (54%)	23 (46%)	Yes
7.	Absence of motivation to use ILIP	66 (66%)	34 (34%)	Yes	34 (68%)	16 (32%)	Yes
8.	Inadequate use of	91 (91%)	9 (9%)	Yes	39 (78%)	11 (22%)	Yes

	computer by learners						
9.	Adoption of new trending programming language	14 (14%)	86 (86%)	No	7 (14%)	43 (86%)	No
10.	Inability of students to purchase personal computer	90 (90%)	10 (10%)	Yes	44 (88%)	6 (12%)	Yes
11.	Lack of technical staff to support students while using ILIP	66 (66%)	(34%)	Yes	33 (66%)	17 (34%)	Yes

In Table 2.1 the findings showed that both students and teachers attested that insufficient time allocation for computer studies in school's timetable can hinder effective use of ILIP in the future, shortage of computer such as laptop and desktop will not make the method effective in the future, epileptic or lack of power supply which is the common problem affecting Nigeria can serve as bottleneck to the use of ILIP in schools, lack of interest of students can also be one of the challenges in using ILIP in the future.

In the same vein, student and teachers agreed that lack of computer laboratory, seminar room or audio-visual room can also serve as problem to the use of ILIP in the future, inefficient number of media (Projector, UPS, Mouse etc.) can serve as setback for effective use of computer to access ILIP platform while absence of motivation among teachers and NGOs can serve as the problem facing the use of ILIP.

Students and teachers believed that inadequate use of computer by learners like using the computer to play game or surfing internet during class can serve as one of the major problems that will hinder the use of the package in the future, adoption of new trending programming language will not hinder the use of ILIP in the future, inability of students to purchase personal computer for self-learning can be a major

problem to the use of ILIP in the future. Finally, both students and teachers showed that lack of technical staff to support students will be challenge to the use of ILIP in the future.

For better understanding, Fig 2.1 and Fig 2.2 below showed the descriptive distribution of the data collected about the challenges of ILIP in the future

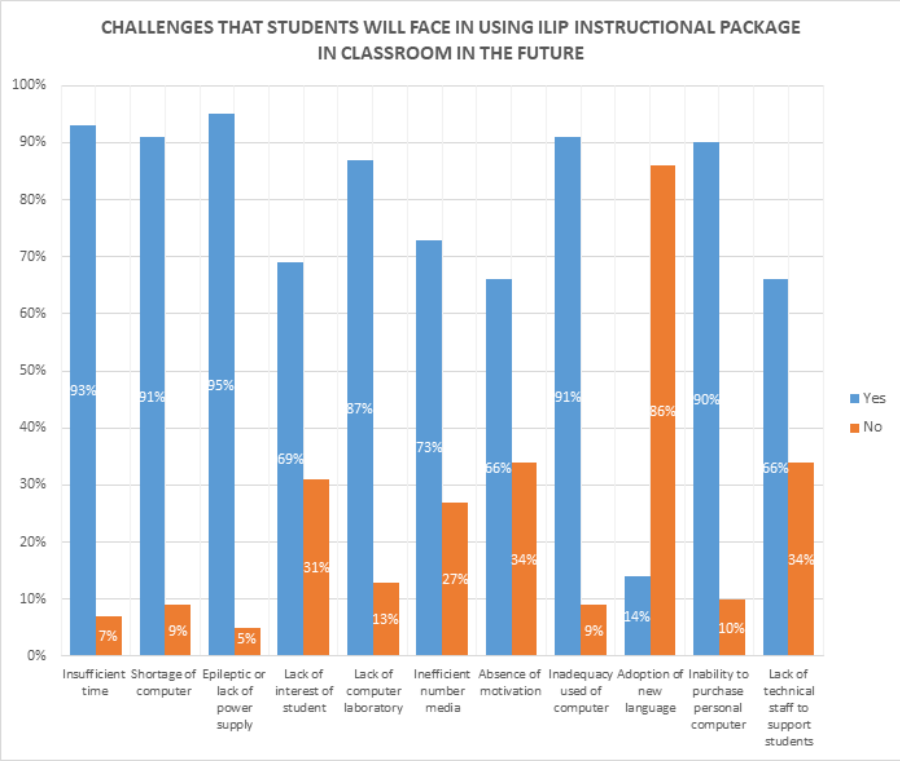


Fig 2.1

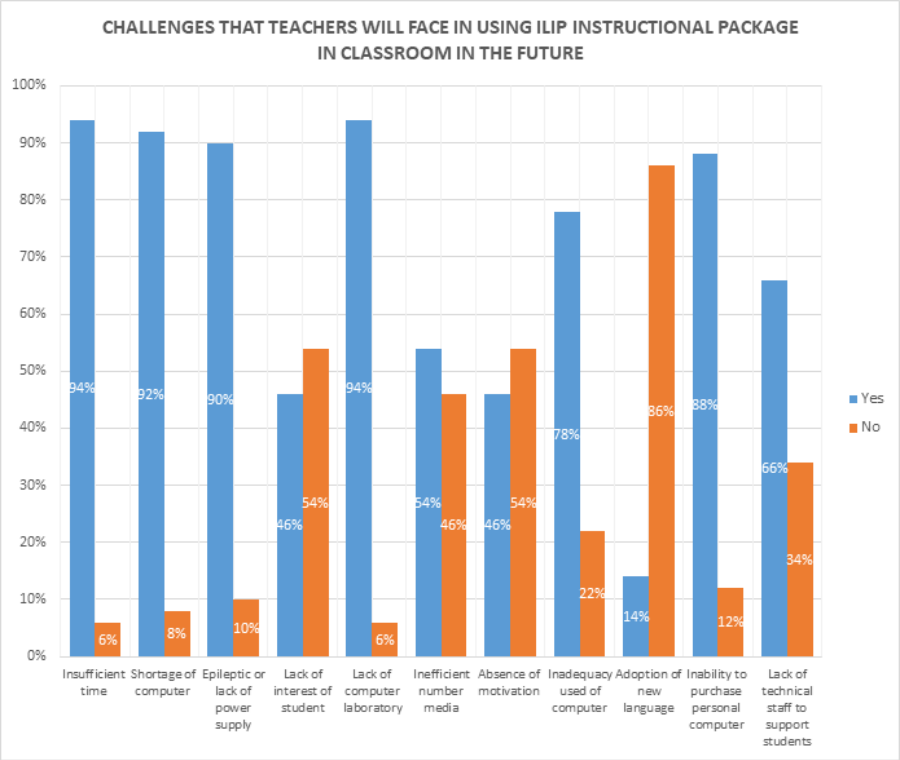


Fig 2.2

Discussion

Table 1.1 and Table 1.2 indicated the percentage of students' and teachers' perceptions of the use of the Interactive Learning Instructional Package (ILIP) in the classroom in teaching and learning BASIC programming. Students and teachers agreed that ILIP is important to the teaching and learning of BASIC. And as well demonstrated a high level of efficiency in the ease of use of ILIP as it is not time-consuming. In essence, students can easily learn BASIC programming skills effectively via ILIP. The majority of the respondents revealed that ILIP is very interactive and easy to access without special training.

This can be supported by Augustine et al (2017) that teachers have a high level of perceived usefulness and perceived ease of use of

technology materials. It is also supported by Yanti et al (2017) who stated that teachers showed 65% higher positive perception of perceived usefulness and 55% positive perception of perceived ease of use of E-learning in educational activities.

The respondents from Tables 1.1 and 1.2 revealed that ILIP has the capacity to increase students' academic achievement in BASIC programming. This is in agreement with Odo's (2016) submission that students taught with computer simulation have higher achievement scores than the conventional method. The finding revealed that students concentrate more on learning activities. The majority of the respondents disagreed with variable 16 which says ILIP makes learners lose control over the learning process. This means ILIP captures the attention of students while learning BASIC programming. This is supported by The Access Center (2021) which stated that computer captures the students' attention because the programs interact with and engage students' spirit of competitiveness to increase their scores.

Also, the finding revealed that students increased toward learning BASIC programming via ILIP, because it makes students more productive and at the same time enhances interaction among students. This idea conforms to Odo's (2016) view that the Simulation Method of Instruction (SMI) helps to create meaningful learning and at the same time students taught with SMI show more interest in a programming language than those taught with the Traditional Method of Instruction (TMI).

The study also found that ILIP is easy to navigate through its environment, very interactive, easy to access without special training and enhances interaction among students. This is in line with the finding by Akinyemi (2013) that LOGO was child-friendly, not difficult but easily accessible, enjoyable, and could be learned and used in an easy and natural way.

Table 2.1 revealed that both students and teachers for this study attested to the following possible challenges that can affect the application/usage of ILIP in the teaching and learning of BASIC programming in the future: Insufficient time allocation for computer

studies in the school's timetable, shortage of computers such as laptop and desktop, epileptic or lack of power supply, lack of interest of the student in using ILIP, lack of computer laboratory, seminar room or audio-visual room, inefficient number of media (Projector, UPS, Mouse etc.) for effective use of a computer to access ILIP platform, absence of motivation to use ILIP, inadequate use of the computer by learners, Inability of students to purchase a personal computer and lack of technical staff to support students while using ILIP.

The above result is confirmed in Awotokun's (2016) submission that lack of ICT literacy among teachers, unstable electricity supply, high cost of ICT facilities, inappropriate funding etc., affect the use of ICT in schools. The result is also in line with Murtala and Norazrena's (2019) report which emphasizes that the factors that hinder the use of ICT materials in school are lack of training among teachers and lack of access to technological materials.

Conclusion

Based on the results of this finding, Interactive Learning Instructional Package has been found to be a greatly beneficial educational tool in Nigerian Senior Secondary Schools. Both teachers and students have expressed positive perceptions of the package, citing potential benefits to student learning outcomes, increased engagement levels, and improved teacher-student relationships. Despite these observations, there are still areas of improvement that can be addressed, such as providing adequate training for teachers and ensuring that the package is tailored to the needs of individual students. With these considerations in mind, an interactive learning instructional package can remain an effective and beneficial tool for Nigeria Senior Secondary Schools.

Recommendation

In view of the findings of this study, the following recommendations were made:

(a). Teachers of Computer Studies should use Interactive Learning Instructional Package (ILIP) in the schools to teach BASIC programming.

(b). Well-equipped computer laboratories and power supply should be made available in public senior secondary schools by the government or NGOs to enhance easy use of Interactive Learning Instructional Package (ILIP) strategy.

(c). The use of ILIP strategy should be given greater emphasis in the curriculum. That it, Curriculum planners, instructional designers and developers in Nigeria should emphasize on the need to continuously use ILIP strategy to improve instructional delivery.

(d). Seminars, workshops should be organised by relevant bodies to educate and sensitize the teachers on the use of ILIP in teaching and learning of BASIC programming in Computer Studies

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Assessment of Power and Load Factors in Older Adult Learners' Margin to Learn in National Open University of Nigeria

Évaluation des facteurs de puissance et de charge dans la marge d'apprentissage des apprenants adultes plus âgés à l'université ouverte nationale du Nigeria

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Abstract

Drawing from the McClusky theory of power load margin, this study examines the margin of learning among older adults in Open and Distance Learning (ODL) system using the National Open University of Nigeria Port Harcourt Study centre. A sample of 69 older adults were administered questionnaire to obtain quantitative data and 21 persons were drawn for focus group discussion to collect qualitative data on the power of learning and the load in learning among older adults in the ODL system. The data collected were analysed using descriptive statistics. From the formula of margin of learning L/P the study reveals that the margin of older adult learning is -0.23 or 1.08 indicating a deficit power of learning. The study further reveal that the power of learning among older adults are increase financial capacity, prior learning experience, and high mental state to learn; while the load to learning are religious commitment, family pressure, course load and socio- economic demands. These findings can inform tailored

intervention on motivating older adults in National Open University of Nigeria. This study provided an insight on the application of the theory of margin by McClusky among older adults in ODL system.

Keywords: Older Adults, Open and Distance Learning, Power Factor, Load Margin

Résumé

S'inspirant de la théorie de McClusky sur la marge de puissance et de charge, cette étude examine la marge d'apprentissage des adultes plus âgés dans le système d'enseignement ouvert et à distance (EOD) en utilisant le centre d'étude de l'Université nationale ouverte du Nigeria à Port Harcourt. Un échantillon de 69 adultes âgés a été soumis à un questionnaire pour obtenir des données quantitatives et 21 personnes ont été sélectionnées pour participer à des discussions de groupe afin de recueillir des données qualitatives sur le pouvoir d'apprentissage et la charge d'apprentissage chez les adultes âgés dans le système d'enseignement ouvert et à distance. Les données recueillies ont été analysées à l'aide de statistiques descriptives. À partir de la formule de la marge d'apprentissage L/P, l'étude révèle que la marge d'apprentissage des adultes plus âgés est de -0,23 ou 1,08, ce qui indique un pouvoir d'apprentissage déficitaire. L'étude révèle en outre que le pouvoir d'apprentissage chez les adultes âgés réside dans l'augmentation de la capacité financière, l'expérience d'apprentissage antérieure et l'état d'esprit élevé pour apprendre, tandis que la charge d'apprentissage est l'engagement religieux, la pression familiale, la charge de cours et les exigences socio-économiques. Ces résultats peuvent servir de base à une intervention sur mesure visant à motiver les adultes plus âgés au sein de l'Université nationale ouverte du Nigeria. Cette étude a donné un aperçu de l'application de la théorie de la marge de McClusky chez les adultes plus âgés dans le système de l'ODL.

Mots-clés : Adultes âgés, formation ouverte et à distance, facteur de puissance, marge de charge

Introduction

Open and distance learning (ODL) provides a wide latitude of opportunity for both young and old to have access to learning opportunities. To the older adults who are in their post work life and post child bearing age, they engage in different forms of learning as part of lifelong learning in order to update their knowledge, retool their skill and acquire new skill. Older adult in this context refers to those from chronological age of 60 years and above. Even the United Nation accepted 60 years as the starting point for older adults (Findsen and Formosa 2011). Most of the older adult learners engage in open and distance learning because of the flexible, open and accessibility of the learning system. There has been increasing enrolment of older adults in Open and Distance learning programmes (Latif, 2010). Kim and Merriam (2010) pointed out that cognitive interest and social contacts were the most influential motivating factors for older adults to participate in formal learning. Other scholars like Gram and Donaldson, and Pourchot cited in Lin (2011) identified the desire to learn, personal development and leisure as the motivating factor to enroll in formal learning. Learning has become part of the ways older adult maintain themselves to age graciously, face continuous growth, change, integrate and improve their quality of life. Most research on older adult education elucidate on participation in higher education with focus on their motivation to learn or the learning barriers. However, participating in higher education and in particular in open and distance learning programmes is not without some challenges. De Vito (2009), and Patrick and Abba (2014) identify the barriers to learning among older adults in open and distance learning programme. Some of the barriers include: accessibility (time, flexibility, and instructional method), affordability (cost), accountability (being an independent learner, family and community responsibilities). These barriers are possible factors for attrition or delay in completion of study.

The motivating factors are the power to learn; while the learning barriers are the load, which the learners carry. How the energy and load are managed is important in determining the success and outcome of learning (Kim, & Merriam, 2010). When the load is more than the

power the margin to learn will drop, but when there is increase in power and load is reduced, the margin to learn will be high. The interplay of Power–Load factors in learning is the main thrust of McClusky's theory of Margin. While most research in older adults focuses in participation in higher education in particular in ODL system examining their motivation or learning barriers, but no research seems to bring the two into focus and determine the margin to learn using the McClusky's theory of margin as it relates to older adult learners in ODL and in particular in the National Open university of Nigeria's open and distance learning system. Perhaps what seem close to the application of this theory was by Salyer-Funk (2012) which examines the power load of women in tenure higher education programmes. To fill this gap and to bring to bear the theory of margin in learning as enunciated by McClusky in NOUN ODL system is the problem of this study. Therefore, the problem of this study is to assess the power load factors in older adult learners' margin to learn in National Open University of Nigeria (NOUN).

The objectives of the study are to:

1. assess the power factors in learning among older adults in National Open University of Nigeria; and
2. assess the load factors in learning among older adults in National Open University of Nigeria.

Based on these objectives, two research questions guided the study from which the margin of learning of the older adults can be established. The research questions are:

1. What are the power factors in learning among older adults in National Open University of Nigeria?
2. What are the load factors in learning among older adults in National Open University of Nigeria?

The study will be of interest to both sociologists and psychologists of adult learning in particular to educational gerontologist on how older adults learn and how to reduce their load and increase their energy in learning to have high margin of learning.

The McClusky's Theory of Margin

Harward Y. McClusky was a Professor of Educational Psychology and Community Adult Education at the University of Michigan. In his study of how adults learn and how to ensure positive approach to life, propounded the theory of margin. McClusky believes that as people age various demands and pressures increase, and that adulthood entails continuous growth, change, and integration, and that efforts must be made to judiciously use the energy available to meet the emerging and changing responsibility. He postulated that because people have less control over many aspects of their lives, they must find ways to be prepared to meet unpredictable crisis or problem (Hiemstra cited in Salyer-Funk, 2012). McClusky holds that an adult life is characterized by load of living (load here refers to demand on resources), and that the adult requires power (power here refers to resources) to carry the load. To him margin is the ratio or relationship between load and power. From these three concepts, McClusky propounded the theory of Power-Load-Margin of adult learning. He was of the view that the theory was relevant to the understanding of adults' physical and mental wellbeing especially in the later life when there will be increasing demands and pressures. According to McClusky load is the self and social demands required by an adult to have a basic level of autonomy or independence. Power is the resource, the ability to do things, possessions, positions, allies, and supports which an adult requires or must possess to cope with or carry loads associated with life (Main, 1979). It is the driving force to learn.

McClusky came up with a mathematical formula for calculating the amount of margin a person can have to carry load associated with life. Load (L) is the numerator and Power (P) is the denominator. Thus the formula is M=L/P. According to McClusky, one must have the right margin to through successfully in certain life situation. This implies that the more the power (resources) an individual possess the higher the margin. When an individual has surplus power he will be able to handle more load or cushion the pressure of the life load. On the other hand, margin could be increased by reducing the load or increasing power. McClusky (1970:2) puts it in this way:

> A crucial element for meeting learning or other life demands is the ratio between load and power. No matter the level of load, within reasonable limits, the most important element is surplus margin of power. The margin allows the person the necessary resources and intellectual autonomy to examine a more full range of responses and enables the person to develop and adapt because of the load and the thought processes required to navigate the situation.

McClusky used another concept in further explanation of the formula, the concept of 'vitality' (V). According to him when L/P ratio is subtracted from one with the equation 1-(l/P) the result is vitality. The total V is one or 100%. This represent infinite possibility of power and combination of load, a person with vitality is one that is creative, capable, dynamic and complete. McClusky assigned values to load and power indicators between .50 to .80 and that a value of this range would provide enough margins to meet the various emergencies that occur throughout life. He further dichotomized the load into two groups of interacting elements: external and internal. The external load consists of tasks involve in normal life requirements (such as family, work, socio-economic status, and community responsibilities). The internal load consists of individual expectancies (such as aspiration, goals, self-concepts, desires and future expectations). Power consists of a mix of external resources and internal resources. The external resources include the capacity of family support, social abilities, and economic abilities. The internal resources are the accumulated or acquired life skill, experiences, resiliency, coping skills, and personality. The power factor is divided into five: Physical- Increased strength, stamina, energy, and health; Social- ability to relate with other people, social support; Mental- ability to think rationally, reasoning; Economic- Increasing wealth, position, influence, and Skills- what the individual knows how to do.

Thus, a person's performance will be a functions of various load dimensions and values, as well as a capacity to carry the load. Margin can be increased by reducing load or increasing power. McClusky (1963) suggested that surplus power is always needed to provide

enough margin or cushion various load requirements and life emergencies. This theory provides an explanatory armory to account for some of the happenings throughout life. The theory is useful in describing varying degree of margin that is required in adult adjustment as they age particularly at the third and fourth age. This theory is also relevant in explaining how adults adjust when they return to school.

Research Methodology

The research design adopted is the descriptive survey research design. A survey of the Power-Load-Margin (PLM) of learning was conducted among older adult learners in National Open University of Nigeria (NOUN) Port Harcourt Study Centre. A total of 95 older adults aged ranging from 60 years and above registered students of NOUN was used in this study. Both qualitative and quantitative methods were adopted. The qualitative method of data collection entails the use of Focus Group Discussion (FGD). Three FGD sessions were organized each made up of 7 participants. Thus 21 older adults participated in the FGD made up of 12 females and 9 males all within the age range of 65 and above. The theme of the discussion was drawn from the thematic focus of the study. These are:

1. The power factors in learning among older adults in National Open University of Nigeria
2. The load factors in learning among older adults in National Open University of Nigeria

The quantitative data was collected through a questionnaire with items to elicit the power and load in older adult learning. The questionnaire is called 'Rating Scale for Power-Load-Margin of Learning among Older Adults in the Open and Distance Learning (RSPLMOAODL). The questionnaire is divided into two sections. Section A contains the demographic items to collect demographic information about the respondents. Section B contains items that seek to address the research questions, which are the power-load factors in older adult learning. Section B is of two sub-sections each containing 10 items with a response option of Very High Extent (VHE) -5, High Extent (HE) -4, Moderate Extent (ME) -3, Low Extent (LE) -2, Very Low Extent (VLE) -1 respectively.

The draft instrument was given to three experts: an educational gerontology, measurement and evaluation, and sociology of adult education. They assessed the instrument in terms of its clarity, relevance and appropriateness to answer the research question. Thus the basis of validation was the face and content validity. To determine the reliability of the instrument, the test-retest method was used. The validated instrument was administered to a pilot study group of twenty (20) older adult learners aged 60 years and above in Calabar study centre. The instrument was administered twice within an interval of two weeks. The two sets of questionnaire were correlated using Pearson Product Moment Coefficient (PPMC); the calculated coefficient was 0.86 which indicates that the instrument was adjudged to be reliable.

Seventy-four copies of the questionnaire were distributed out of which 69 copies were duly filled and returned representing 93.24%. The quantitative data collected were analysed using percentage, the mean and rank other. The criterion mean is determined as follows 1+2+3+4+5=15/5 = 3. Thus, any mean from 3 and above is regarded as High Extent (HE) and any mean from 2.99 is regarded as Low Extent (LE).

Results

Research Question 1: Research Question: What are the power factors in learning among older adults in National Open University of Nigeria?

Table 1: Power Resources of Older Adults to Learn in the NOUN

Power Factors	VHE	HE	ME	LE	VLE	× RM	Rank
Stamina for learning	2(10) 2.8%	9(36) 13%	13(39) 18.6%	20(40) 28.9%	25 (25) 36.23	2.17	LE 8
Desire and aspiration to learn	10(50) 14.5%	14(56) 20.3%	18(54) 26%	14(28) 20.3%	13(13) 18.8%	2.9	LE 5
High mental state to learn	18(90) 26%	15(60) 21.7%	13(39) 18.8%	10(20) 14.4%	13(13) 18.8%	3.2	HE 3
learning condition	16(80) 23.2%	12(48) 17.4%	21(63) 30.4%	8(16) 11.5%	12(12) 17.4%	3.1	HE 4
Prior Learning Experience	25(125) 36.2%	19(76) 27.5%	5(15) 7.2%	13(26) 18.8%	7(7) 10%	3.6	HE 1
Institutional Support to learn	2(10) 2.8%	9(36) 13%	10(30) 14.5%	23(46) 33.3%	25 (25) 36.2%	2.1	LE 10
Family support to learn	5(25) 7.2%	15(60) 21.7%	9(27) 13%	14(28) 20.3%	26(26) 37.7%	2.2	LE 9
Financial resources to learn	22(110) 31.9%	16(64) 23.2%	12(36) 17.4%	10(20) 14.5%	9(9) 13%	3.4	HE 2
Peer support system to learn	12(60) 17.4%	8(32) 11.6%	19(57) 27.5%	10(20) 14.5%	20(20) 28.9%	2.7	LE 6
ICT skill to learn	6(30) 8.7%	7(28) 10%	12(36) 17.4%	19(38) 27.5%	25(25) 36.2%	2.27	LE 7
Grand Mean						2.76	LE

Table 1 shows the power resources of older adult learners in the NOUN. Table 1, items 1, 2, 3, 4 and 5 are internal power factors while items 6, 7, 8, 9, and 10 external power factors. The table shows that 2.8% of the respondents have very high extent of stamina for learning,

while 36.2% have very low extent of stamina for learning. The mean rate of the extent of older adults' stamina for learning is 2.17 which is below the criterion mean, consequently it implies that the older adult learners have low stamina for learning. Stamina for learning is ranked 8th out of the 10 powers identified. This implies that they cannot have a sustained long hour of learning. The table also shows that 14.5% of the respondents have very high extent of desire and aspiration while 18.8% of the respondents have low extent of desire and aspiration for learning. The mean rate of the extent of older adults' desire and aspiration to learn is 2.9 which is below the criterion level of 3.00, and consequently the extent of learning driven by their desire and aspiration is low. The desire and aspiration to learn among the older adults ranked 5th.

However, among the internal power factors of learning, mental status, learning condition, and prior experience in learning all have mean scores that are above low extent and consequently regarded as high extent. The mean scores are 3.2, 3.1, and 3.6 respectively. 23.2% of the respondents have very high extent of learning condition while 17.4% have very low extent of learning condition. 36.2% of the respondents have very high extent of prior experience in learning while 10% of the respondents have very low extent of prior learning experience. Prior learning experience has the highest mean score and is ranked highest implying that most the older adults have good learning experience, which they now draw on in their present learning effort.

Table 1 shows that all external power factors are low except the financial power of the learner. The table shows that 2.8% of the respondents have very high extent of institutional learner support, while 36.2% have very low extent of institutional learner support. The mean score of the extent to which older adult get institutional learner support is 2.1, which is below the criterion mean and so is considered low. This ranked 10th and the least resources the older adults can depend on to reduce the load factor. The table also shows that 7.2% of the respondents have very high extent of family support while 37.7% of the respondents have very low extent of family support. The extent to which older adults get family support to learn is low. The mean score is 2.2 and ranked 9th out of 10 items. In respect of the mean score of

the extent to which older adults get peer support to learn is 2.7 which is an indication the older adults get low peer support to learn. 17.4% of the respondents have very high extent of peer support while 28.9% the respondents have very low peer support. Peer support ranked 6th on the table. The table also shows that the mean score of the extent of the older adults' ICT skill to learn in NOUN is 2.27 which is low. The grand mean of the power factor which can drive the older adults to learn in the NOUN is 2.76 which is low.

What are the load factors in learning among older adults in National Open University of Nigeria?

Table 2: Load Factors of Older Adults to Learn in the NOUN

Load Factors	VHE	HE	ME	LE	VLE	×	RM	Rank
Family Pressure	17(85) 24.6%	19(76) 27.5%	13(39) 18.8%	10(20) 14.5%	10(10) 14.5%	3.33	HE	3
Career demands	9(45) 13%	10(40) 14.5%	13(39) 18.8%	18(36) 26.1%	19(19) 27.5%	2.59	LE	7
Socio-economic demands	21(105) 30.4%	19(76) 27.5%	7(21) 10.1%	13(26) 18.8%	9(9) 13%	3.24	HE	4
Community responsibility	24(120) 34.7%	18(72) 26.1%	9(27) 13%	10(20) 14.5%	8(8) 11.5%	3.57	HE	2
Religious Commitment	27(135) 39.1%	20(80) 28.9%	3(9) 4.2%	10(20) 14.5%	9(9) 13%	3.66	HE	1
Course load	13(65) 18.8%	14(56) 20.3%	18(54) 26%	14(28) 20.3%	10 (10) 14.5%	3.08	HE	5
Poor instructor attitude to learners	15(75) 21.7%	10(40) 14.5%	19(57) 27.5%	15(30) 21.7%	10(10) 14.5%	3.07	HE	6
Learning environment	10(50) 14.5%	9(36) 13%	14(42) 20.3%	16(32) 23.2%	20(20) 28.9%	2.37	LE	10
	8(40)	8(32)	18(54)	14(28)	21(21)			

Poor self-concept	11.6%	11.6%	26%	20.3%	30.4%	2.53	LE 8
Future Expectation	6(30) 8.7%	12(48) 17.4%	12(36) 17.4%	19(38) 27.5%	20(20) 28.9%	2.49	LE 9
Grand Mean						2.99	LE

Table 2 shows the load factors, which are likely to undermine or limit the margin to learn. Items 1 to 8 are the external load factors while items 8 and 9 are the internal factors. The table shows that 39.1% of the respondents have very high extent of religious commitment while 13% of the respondents have very low extent. Religious commitment has a mean response of 3.66 and ranked 1st load factor in learning among older adults engaged in NOUN. This is followed by community responsibility which ranked 2nd with a mean response of 3.57. The table shows that 34.7% of the respondents have very high extent of community responsibility while 11.5% 0f the respondents have very low extent of community responsibility. The 3rd in the rank is Family Pressure with a mean response of 3.33. 24.6% of the respondents have very high extent of family pressure while 14.5% of the respondents have very low extent of family pressure. The 4th in the ranking order is Socio- economic demands with a mean score of 3.24. 30.4% of the respondents have very high extent of socio-economic demand while 13% of the respondents have very low extent. The mean score of the respondents on course load is 3.08; it ranked 5th with 18.8% of the respondents having very high extent and 15.5% having very low extent. The 6th in the rank order is poor instructor attitude to learners; it has a mean response of 3.07. 21.7% of the respondents have very high extent of perception of poor instructor attitude to learners. 14.5% have very low perception. The table shows that career demands and Learning environment both have low mean scores. The mean responses of the respondents are 2.59 and 2.37 respectively. The table also shows that the internal load factors are not high.11.5% of the respondents have very high poor self-concept while 30.4% has very low poor self-concept. The extent to which future expectation is a load to the older adults is not high. 8.7% of the respondents have future expectation as very high load factor while 28.9% have very low extent. The mean responses of the respondents on poor self-concept and future expectations are 2.53 and 2.49 respectively.

Among the load factors, learning environment is the least load factor while religious commitment is the greatest load. From table 1 and 2 what is the margin of learning? Table 1 shows that the grand mean of the power of learning among older adults in the ODL is 2.76, while the grand mean of the load of learning among older adults in NOUN is 2.99. This shows that the older adults have a deficit power of learning of -0.23. The formula for calculating the margin of learning is M=L/P. Thus $\frac{2.99}{2.76}$thus the margin to learn is 1.08, the load of learning being higher than the power of learning the capacity to learn and probability of duly completing ODL programme will be low.

In the Focus Group Discussion, the participants pointed out that they do not have the stamina to read for a long time as they use to do when they were quite young. Similar view was expressed by the participants that they cannot seat for a long time in the classroom for lecture. When asked what could be responsible for that, some of the participants pointed out that they feel tired, inpatient, and bored seating down for long. This was the exact words of one of the participant in the FGD:

> When I was a small boy in my secondary school days, I was quite energetic, I can seat for a long time in the class listing to our teachers, we usually seat in one classroom, and our teachers come in every 45 minutes from 8.45am after the morning devotion till 11.30 am for break. Class resume by 12 noon till 2.30pm. Similarly, after school in the evenings we usually have prep a time for reading for all the students from 6 pm to 9.30 pm. Now at my age I cannot seat for these number of hours. If I seat for long hour now in the class or reading within a short period I will lose concentration and sleep off and sometimes feel back pain.

The participants also state how they have lost some basic learning skill. One of the participants expresses his view of the loss of basic learning skill:

> I use to be multitask oriented, I can do several things at the same time, example reading and talking, reading and listening to music, eating while reading. I can do several things at the same time without being distracted. All of these strengths are gone. I cannot read for a long time, I am getting weaker as the days go by and as I add more days and years to my age. There are a lot of distractions: family problems, community problems, religious commitments, and even financial issues. Life challenge is increasing particularly with the present economic condition.

One of the participants has a contrary view; saying that his academic performance is higher compared to when he was a young student in the college and undergraduate days. He said this:

> …. that I performed better now as an elderly man still in the University in a M.Ed Programme. The reason being that I do not drink, socialise, and waste most of my man hour in parties enjoying; rather I respect myself and stay away from frivolous activities that does not add value to my age as an adult. Therefore, I concentrate on my academics more: reading and doing assignments as when given. Having a good foundation in basic and post basic education is important in learning in the later age.

When asked in the FGD of the various ways in which they have received support and assistance in their studies in the ODL system, the participants all pointed out that when they find it difficult to operate any of the ICT applications and soft ware's necessary for their study such as using Zoom class, Google class, Skype, the NOUN i-learn platform and other platforms of conferencing, they receive little support from the counsellors and other support staffs. However, some of them pointed out that they get support from family members

particularly from their grandchildren or young people in the family. They also pointed out some of their peers have also been helpful through group private tutorials. When asked what has kept them going in their studies, some of the participants said the strong desire to obtain a higher degree, seeing it as a life ambition, and self-actualization. When asked the extent of institutional support obtained from the National Open University if that has been of great strength and sources of power to drive their learning, majority of the participants responded negatively. They answer that the Counsellors and the ICT officers have not supportive, course materials are not readily available; the institution website is always down making course registration and checking of results difficult. On financial support most of the participants reported that they self-sponsor their study and that the manner in which the Open University spread the payment system makes it less burdensome.

Discussion of Findings

The study reveals that there was increasing decline in the stamina for learning among the older. The mean response of the respondents on this item is 2.17 which is below the criterion mean for high extent of load factor. In the FGD, most the participants affirmed this. The participants in the FGD pointed out that they can no longer read or stay in a class for a long period. This finding is in line with the observation that people lose stamina, as they grow older. This finding further corroborates the views of some scholars as pointed out by Berman and Furst (2011) and Lobr, Findsen and Mott (2020) that older adults do experience decline in all aspect of life, that they become physically and mentally frail and psychologically fragile. The implication of the finding is that power to learn in the Load-Power- Margin is negatively affected as a result of decline in the stamina. Stamina is like the energy one puts into an action. With the decline in the stamina to learn, there will be low sustained hours of learning and consequently the margin to learn will drop. The study also reveals that institutional support for learners is low. The mean response of the respondents on this item is 2.1, which is below the criterion mean for high extent of power factor. The findings of this study corroborate the observation of most scholars that in ODL institution rather than investing in learner support invest

more in technology. Usun (2004) observed that more resources are invested in technical services than in learners support service. Previous research identified four types of learner support services (Dillion and Blanchard cited in Usun 2004). These are: Learner support services that addresses the needs of the learners; learner supports on the subject content; learners support services that related to the institutional context; and use of technology. Some of the learner support services that ought to be provided for the older adults in ODL system are: pre-admission counselling, admission and registration information for students, e-library services, tutoring and counselling, guide on the use of instructional material and technology such as ICT facilities, and understanding blended learning. These support systems according to Bergman (2020) are customer service that needs to be prompt and efficient in order to allay the fears and anxiety in returning to formal learning in ODL system. The study reveals that only 2.8% of the respondents appropriate the available institutional learner support to a very high extent while 36.2% have very low extent of institutional learner support. The implication is that either the learner support system is very poor or the older adult learners have not been accessing the available learner support system. The study also reveals that family support to older learners is low. The mean response of the learners is 2.2 which is very low. Older adult learners get assistants from family members in their learning in such areas like aiding them in their difficulties in using modern online technology, support in provision of materials for class assignment and other form of home assignments. This type of supportive learning has been seen as intergenerational learning.

This study gives further insight into intergenerational learning aspect of the older adult's dependence on young family members. The older adults often rely on younger family members on the use of ICT because the older adult learners are not of digital age; rather as digital migrants they need the support of the digital natives to support their ascendance into the digital community of learners. The finding of this study in respect of support from family members is in line with the study by Patrick, Onyenemezu and Olumatin (2019) that older adults acquire digital knowledge through the support and assistance of the young generation. The study also reveals that the older adult learners in the

ODL programmes in Nigeria have low ICT skills. Having low ICT skill in ODL system diminishes their power of learning and increase the load to learn. This is because ODL is ICT driven and without ICT skill an ODL learners cannot effectively navigate the open and distance learning system.

On the other hand, the study reveals that the power factors for learning in the ODL system among older adults are desire and aspiration to learn, high mental state, learning condition, finance, and prior learning experience. Learning in later life often takes cognition of prior learning and the experience of learners accumulated over the years as result of the maturity of the learners. Most often the older adults bring to bear in the learning their experiences and their prior learning experiences. This is a power factor in their learning which do facilitative their learning. The finding of this study further validates the second assumption of the theory of andragogy that: an adult accumulate growing reservoir of experience, which is a rich resource for learning (Merriam, 2017). The study reveals that older adults in the ODL system in Nigeria have higher financial resources to learn. The mean score of the respondents is 3.4. This finding of increase financial support perhaps may be as a result of increased reliance on their pension fund. The study reveals that most of the participants in the ODL programme are retired blue and white color workers with less family responsibilities. People in later life are free from child bearing and rearing, so most of them at this age having retired at work would want to engage on formal learning for leisure, meeting people of their age and other learners. This study also reveals that older learners' peer support system is high. In the ODL system learners greatly engage in peer support system, collaborating in various learning task, peer review assignments, and group discussion. Van Zyl, Els and Blignaut (2016) observed that in the ODL system learners are encouraged to form study groups.

In respect of the load factor, the following were considered by the respondents as loads in the learning in the ODL system: family pressure, Career demands, Socio- economic demands, Community responsibility, Religious Commitment, Course load, Instructor attitude to learners, and poor self-concept. The findings of this study is in line

with previous research by Smith, Smith, Rose, and Ross-Gordon (2020) that adults' participation in adult education programmes tends to be erratic due to personal and family responsibilities, and work responsibilities. Smith et al also assert that the adult learners have multiple competing life roles such as parenting role, community and religious leader. They carry these loads even as learners in open and distance learning programme. Smith et al also identified the educational policies and programme implementation as barriers to adult learners' participation in adult education programmes. These barriers are loads, which the adult learners contend with in their learning. The findings of this study reveal that the loads the adult learners contend with is not only from within the adult learners themselves, but from instructors who are expected to facilitate adult learning.

The study also reveals that there is poor instructor attitude to learners. The mean response of the respondents is 3.07. Kuh cited in Bergman (2020) pointed out that instructor interaction is key in retention and persistence and that instructors ought to be knowledgeable in how to handle non-traditional learners (older adult learners are non-traditional learners) and understand their unique circumstances, support the learners in the course delivery. The absence of an effective facilitating skill with attendant poor attitude to the learners will increase the learner's load. Some of the facilitators may have poor facilitating skill and with lots of attitudinal problems that may undermine the older adults learning process. This finding further corroborates the observation of Arinto (2013) that the role of the teacher in the ODL system is amplified, the teacher must be aware of the pedagogies and skills in online learning which most of the teachers do not acquire. The lack of andragogical skill and the inability of the facilitator to act like a curator cause a load to the learner. A curator balances the freedom of individual learners with the thoughtful interpretation of the subject being explored. If this balance is not achieved the learner's load increases.

The study reveals that religious responsibility is the highest load older adults have as a load in the ODL system. They find it difficult to reconcile their religious commitment with that of the study time and

class attendance online or tutorial class. As people transcend into the third and fourth age, their perception about materialism shift to higher level of consciousness, they begin to seek the meaning of existence and the connection between the self and divine. This finding corroborate Cannon (2017) that older adults yearn for more understanding of life the spiritual connection of what they do. The study also corroborates the Piercy (2013) about the role of spirituality in adult learning.

Conclusion and Recommendations

Because learning is life deep and life wide, learning does not end until death, older adults continue to learn engaging in diverse learning sites in the society. The older adult learner is a self-directed learner; his readiness to learn is internally motivated. What will make an older adult learner succeed in any learning activity is the amount of energy, which the learner has to drive the learning. This energy is the power. If the load is more than the energy the level of attrition will be high, but if the energy is higher than the load, the learner will strive to learn more. From the findings it can be concluded that the driving force, power and resources which older adult learners can depend on in navigating open and distance learning process is their prior learning experience, maturity of learning and financial independence. Whereas the overriding and overarching load which tends to undermine their capacity to learn are religious and community responsibilities, family pressure, course load, poor attitude of instructors and socio- economic demands. The increase load may cause increase attrition level among older adults or delay completion of course of study, but increasing the power and resource through increase learner support, family support, peer support, improve learning environment and adopting older adult friendly ICT will increase the margin to learn among the older adults in the ODL system. It is therefore recommended that older adult learners should take deliberate and appropriate action to reduce their load factors and increase their power of learning. Furthermore, learner support services be directed at helping the older adults reduce the load factors in the ODL system through a more flexible system that will adequately address the load factors.

The findings and conclusion of this study validates the McClusky's theory of power-load- margin. However, the purposive sampling method adopted in this study may have created unpredictable biases that will make it difficult to generalise on the power load factor among older adult learners in ODL system. Therefore, there is the need for further research on the power load and margin of learning in diverse learning environment using larger sample size.

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Achieving Error-free posts in Asynchronous facilitation: Findings from the Discussion Forum Posts of 100 Level Students of National Open University of Nigeria

Réaliser des messages sans erreur dans la facilitation asynchrone : Résultats des messages du Forum de discussion des étudiants de niveau 100 de L'Université nationale ouverte du Nigeria

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Abstract

In order to achieve error-free posts in asynchronous discussion forum in online teaching among students of Open Distance e-learning (ODeL), this study examines patterns of errors in the use of the simple past tense on the discussion forum posts of the 2018/2019 academic session of one hundred level students of National Open University of Nigeria. Past tense errors occur when the wrong verb tense is used in writing. Using Corder's, quoted in Ellis (1994), steps in error analysis, and classification, the study found that of the three hundred and forty-eight (348) students who responded to the post, one hundred and ninety-three students (55.5%) committed errors of omission. Nineteen students (5.5%) added redundant morphemes to irregular verbs. One hundred and thirty-six students (39%) mis-selected the wrong morphemes in marking simple past tense. The findings from the study suggest that the reason for the errors are attributed to the inconsistencies in the English language especially with past tense formation in irregular verbs. The study recommends that in ODeL, leaners in a second language situation be given more online lectures

that weaves in past tense usage in English language; this will enable them to have a good grasp of the rules guiding simple past tense formation in English, and ensure correctness in the use of the right verbs by students in their posts. The study concludes that students' verb usage in online posts can be improved if online teaching platforms build in prompts that immediately pops up the correct verb whenever a student makes use of the wrong verb in posts. This will be an innovation that will encourage motivation to learn and could culminate to decline in leaners' dropout rate in ODeL in Nigeria.

Keywords: Error analysis, simple past tense, ODeL, asynchronous online post, National Open University of Nigeria (NOUN)

Résumé

Afin de réaliser des messages sans erreur dans le forum de discussion asynchrone dans l'enseignement en ligne parmi les étudiants de l'apprentissage en ligne à distance ouverte (ODeL), cette étude examine les modèles d'erreurs dans l'utilisation du passé sur les messages du forum de discussion de la session académique 2018/2019 des étudiants de niveau cent de l'Université nationale ouverte du Nigéria. Les erreurs de temps passé se produisent lorsque le mauvais temps de verbe est utilisé dans l'écriture. En utilisant les étapes de Corder, citées dans Ellis (1994), dans l'analyse et la classification des erreurs, l'étude a révélé que sur les trois cent quarante-huit (348) étudiants qui ont répondu au message, cent quatre-vingt-treize étudiants (55,5%) ont commis des erreurs d'omission. Dix-neuf élèves (5,5 %) ont ajouté des morphèmes redondants aux verbes irréguliers. Cent trente-six étudiants (39%) ont mal sélectionné les mauvais morphèmes en marquant le passé simple. Les résultats de l'étude suggèrent que la raison de ces erreurs est attribuée aux incohérences de la langue anglaise, en particulier en ce qui concerne la formation du passé dans les verbes irréguliers. L'étude recommande que, dans le cadre de l'enseignement ouvert et à distance, les apprenants en situation de langue seconde reçoivent davantage de cours en ligne qui intègrent l'utilisation du passé en anglais ; cela leur permettra de bien comprendre les règles qui régissent la formation du passé simple en

anglais et d'assurer l'utilisation correcte des bons verbes par les étudiants dans leurs cours. L'étude conclut que l'utilisation des verbes par les étudiants dans les messages en ligne peut être améliorée si les plateformes d'enseignement en ligne intègrent des invites qui font immédiatement apparaître le verbe correct chaque fois qu'un étudiant utilise un verbe erroné dans ses messages. Cette innovation encouragera la motivation à apprendre et pourrait aboutir à une baisse du taux d'abandon des apprenants dans l'ODel au Nigéria.

Mots-clés : Analyse des erreurs, passé simple, ODeL, poste en ligne asynchrone, Université nationale ouverte du Nigeria (NOUN).

Introduction

The challenges in physical learning were significantly brought to the fore with the advent of Covid-19. All sectors including academic institutions were shut down as a result of the pandemic. Despite the pandemic, the online mode of learning which entails learning at the confines of the home went on through synchronous and asynchronous modes of delivery. The asynchronous mode was harnessed more during the pandemic, as it availed leaners with the opportunity of responding to posts at their convenient time. In any of these modes of learning, the users were expected to communicate effectively and abide by the rules of the language use in the interaction. Nigeria, where this study was carried out is a multiethnic country with more than 400 indigenous languages; thus, learners have to grapple with the rigors of learning a second language (English). This probably is the reason why Ezema (1996), says that "The learner acquires a second language in an artificial fashion quite different from the natural way in which a mother tongue is acquired. He or she faces many obstacles as he or she tries to achieve some level of competence in the language" (p. 231). The mother tongue (L1 hereafter) of some Nigerians impinges on the use of English, and sometimes often leads to errors. Communicating flawlessly in the target language most times pose problems for the Nigerian user; as a result of L1 interference. This observation makes it

possible for Nigerians to misuse the English language both in speaking and in writing. According to Corder (1974) every language consists of a set of rules for generating phonologically, syntactically and semantically well-formed sentences. When these rules are flouted, errors arise. Errors are flawed side of the learner, either in speech or writing, as a result of learning a new language. Uba (2015) carried out an error analysis on an adult Nigerian postgraduate student in the United Kingdom, and found that there are a lot of errors associated with both Interlingua and intralingua. The student's second language development moves at lower rate. The study concludes that in terms of teaching implication, some errors can be corrected immediately while others can be delayed because too much negative feedback may hinder the progress of the learner. Madu (2019) examines grammatical errors in thirty copies of three randomly selected widely read Nigerian newspapers. The data were analysed using the Error Analysis procedure of Pit Corder. The findings showed among other factors that grammatical errors in the newspapers were as a result of personal native language habits. The study recommends that print media organizations should adopt good feedback mechanism for improved and error free expressions. Ndubuisi and Aja (2021), using the theoretical framework of Corder (1974), Richard & Schemidt (2002) and Brown (1980), examine some of the errors in the expressions by first year students of Coal City University, Enugu. The errors were classified and labeled as ''Indomie English''. The study concludes that the errors by the students are mostly interlingual errors. This points to the fact that students are still at the beginning point of learning English. Oruwari et al (2021) examine errors in sixty essays written by sixty students whose first language is not the English language. The classification of the errors show that they are six most common errors committed by the students. Among other factors, the study concludes that some of the teachers are not adequately trained or qualified, and this may lead to poor performance of students in the subject. None of these studies focus on errors in discussion forum posts of one hundred level students, and proffer solution on how these errors can be avoided. This separates the current from previous studies.

The aim of this study is to identify wrong usage of simple past tense (SPT) hereafter, obtained from asynchronous online posts (AOP) hereafter, of one hundred level NOUN students; and also proffer

solution on how to ameliorate such challenges using opportunities offered by technology in order to enable them to optimise the benefits of ODeL. It was observed that during the synchronous mode, students use wrong past tense when they wanted to report past experiences. This motivated the researcher to find out if the same error in speech will be observed in their AOP. The specific objectives are: to find out the categories and percentages of errors committed by the students in AOP; and to explain the likely sources(s)/cause (s) of the errors in the use of the SPT by the students, and recommend how it can be overcome.

Literature Review

Previous studies have attributed a huge number of second language (L2) learners' errors to the influence of their first language (Newmeyer, 1996; Lim, 2003; Mahmoud, 2005; Al-Nofaie, 2010; Al-khresheh, 2010, 2011). Newmeyer (1996) argued that using L1 is unavoidable whilst learning L2, because structures from L1 can easily be transferred to L2. Al-Nofaie (2010) stated that when L2 learners use their L1 as a tool to learn their L2, the outcome can be positive or negative.

Classification of Errors and their Causes

Researchers have pointed out that in a second language situation, errors arise in speech and writing; and have classified sources of errors in writing using different labels (Corder, 1971, 974; Richard, 1974; Burt and Kiparsky (1974); Ellis, 1994, 1997; Richard et al. 2002; Selinker, 2008). For example, Corder (1971) classified "errors" into ''errors of competence'' and ''errors of performance''; "errors of competence'" are divided into two kinds—interlingual error and intralingual error. Burt and Kiparsky (1974) pointed out two types of errors as: local error and global error. Dulay, Burt and Krashen (1982) categorised errors into four categories: omission, additional, missed formation, and improper ordering. Error, especially in writing mostly occurs when the wrong tense is used. Tense is normally indicated by the use of a particular verb form – either an inflected form of the main verb, or using the base form, or both in combination. Inflection may involve the use of affixes, such as the ''ed'' ending that marks the past tense of English regular verbs, but can also entail stem modifications, such as

ablaut (the substitution of one root vowel for another e.g. ‘‘Get – got’’). Collinge (1990) noted that “tense is the relationship between the form of the verb and the time of the action or state it describes”. The SPT in regular verbs is formed by adding ‘‘ed’’ to the infinitive, adding –d to verbs ending in ‘‘e’’ verbs ending in consonant ‘‘y’’, change; ‘‘y’’ to ‘‘i’’ and add ‘‘ed’’. The general view about tense is that, the past tense formation for regular verbs is fairly more straightforward than the irregular verbs.

Asynchronous mode of delivery in ODeL

The mode of interactions in Open and Distance eLearning (ODeL hereafter) elsewhere and in Nigeria is mainly through the synchronous and asynchronous mode. Instructors can facilitate interactions through a variety of technologies, such as chats on the virtual learning environment, discussion boards, and email (Sher, 2009; Commonwealth of Learning, 2015; Lowenthal & Moore, 2020; Lowenthal et al., 2021). In asynchronous discussion platforms, interaction occur without being limited by time or space (Brown & Green, 2009; Hew et al., 2010; Bernstein & Isaac 2018).

Asynchronous online discussion forums are seen as an extension of traditional learning that promotes interaction, knowledge construction, and self-assessment (Seethamraju 2014). Brown et al. (1989) pointed out that the asynchronous discussion forum provides the opportunities for learners to actively participate or interact in knowledge co-construction. In a similar vein, Anderson (2009) found that the AOP is able to generate the critical dimensions of learning found in the traditional classroom. Asynchronous online posts are effective writing tool for students (Dennen et al. (2007; Andersen 2009). Asynchronous online posts are among the ways to prepare leaners acquire cognitive and increase their critical thinking (Anderson, 2009; Szabo & Schwartz, 2011; Pena & Almaguer, 2012; Schaefer et al. 2018; Corfman and Beck, 2019). The flexibility of AOP allows leaners participate and respond to posts at their convenience, facilitates lifelong learning, which is learner-centred, personalised, and collaborative (Parajuli, 2016; Jinot, 2020); allow students time to reflect and refer to related information that they have read and

researched (Morrison, et al., 2012; Xie et al. 2014; Wegmann & McCauley, 2014), thereby providing students an opportunity to develop a "more thorough understanding of course content" (Knowlton, 2003, p. 31). Foushee (2018) in a similar line of argument like Knowlton (2003) submitted that the posting of an essay in AOP can help learners to improve their creativity and language writing skills; through engaging in AOP students are able to employ self-assessment strategies to independently revise or rewrite their work.

The studies above have foregrounded the importance of AOP as a tool that enhance learning. A concern is that these previous studies did not proffer solution that will enable students to produce an error-free posts. While researchers have described and highlighted the importance of the AOP as a veritable platform for learner-instructor interaction, they have not been any attempt to show how leaners improve their cognitive abilities through knowing the right form of the simple past tense verbs to use in AOP, this further have negative effect on learners' education on the whole. Given this problem, the current study seeks to address this area of study by examining through empirical data, the type of SPT verb forms in the AOP of 100 level students of National Open University of Nigeria, then recommend ways through which the problem can be mitigated.

Method

The case study method was used in this study. Corder's, quoted in Ellis (1994, p. 48) stages in error analysis are adopted. These stages are: ''collection of samples of learner language (collection of data from the students' responses on the AOP), identification of errors (this was done at the data cleaning stage), description of errors, and explanation of errors''. At the analysis stage, the errors were classified under the subheads: omission of some required element; addition of some unnecessary or incorrect element; and selection of incorrect elements. The dataset was exported to an Excel file and imported into IBM SPSS Statistics for the statistical analysis. The population was all one hundred level students who registered for the 2018/2019 academic session. The sample size was one thousand, and twenty-three (1023), that is, all the one hundred level students who offered GST102 (Use of

English and communication skills) in the 2018/2019 academic session of NOUN, this was when the researcher taught the course. The instrument used in the collection of data was a descriptive written test given to the students to narrate on the AOP, a sad experience they have had using the discussion platform of their virtual leaning environment. Three hundred and sixty-one students responded; of these, thirteen had no errors in their responses, so the analysis was based on the responses of three hundred and forty-eight students. In the analysis section, the excerpts are put in italics to foreground them; also, the wrong verbs are asterisked. The analysis and discussion are presented in the next section.

Analysis and discussion

The findings revealed three categories of errors: omission, addition, and mis-selection. These are mostly intralingual. We take them in turns:

Errors of Omission

Error of omission relates to the absence of an item that must appear in a well-formed sentence. Under error of omission, there are three categories of omission both in regular and irregular verbs:

Omission in regular verbs:
Omission of ‘‘d’’, ‘‘ed’’, ‘‘ied’’
Extract 1: *My uncle that *promise to support …* (promised)
Extract 2: *l *discover that the phone *is not in my bag…* (discovered, was)
Extract 3: *I almost *cry my eyes out …* (cried)

These extracts are examples of the omission of some morphemes by some students in regular verbs. In extract 1, ‘‘-d’’ was omitted; in extract 2 ‘‘-ed’’ was omitted, and extract 3 ‘‘-ied’’ was omitted.

Omission in irregular verbs

Most irregular verbs mark their past tense through stem modification, omission of internal vowel, and change at the end of the verb. In stem

modification, the morphemes omitted are consonant and vowel in a word. Omission of internal vowel is when the student omits just a vowel in the word. Below are the extracts from the data to explain each category:

Stem modification

Extract 4: *I have *break* up with her … (broken)
Extract 5: *They *bring the bag …* (brought)
Extract 6: *I *find it difficult to login to my GST102* … (found)
These extracts are examples of omission of the correct past tense marker by some students. The extracts are irregular verbs; the formation of their past tense forms differ in all the instances. In extract 4, the student omitted the internal vowel and end past tense marker, instead of ''broken'', the student used the base form of the verb ''break''. The past tense form of the verb in extract 5 is ''brought'', but the student used the base form ''bring''. In 6, the student used the base form ''find'' instead of ''found''.

Omission of internal vowel in the verb

Extract 10**:** *That was how I *become …* **(**became**)**
Extract 11**:** *To address the situation before it *get out of hand … (*got*)*
Extract 12**:** *Before I *know the situation …* (knew)
In extract 10, the student used the base form of the verb as the past tense form, instead of ''became'', the student used ''become'' omitting the internal vowel ''a''. Extract 11 is a similar omission of the vowel ''o'', and in extract 12, the vowel ''e'' is omitted.

Omission of end past tense marker (''t'' and ''id'')

The omission of end past tense marker in irregular verbs is another sub-type of errors by some students; extracts 8 and 9 exemplify this:
Extract 8: *It was a night trip which *mean we …* (meant)
Extract 9: *People have *lay ambushed …* (laid)
In extract 8, the student omitted the end past tense marker ''t''; instead of ''meant'', the student used ''mean''. Likewise, in extract 9, the student used ''lay'' instead of ''laid''.

Table 1: Items omitted, number of students involved and percentages

Area of omission/item omitted	**Number of students**	**Percentage (%)**
Regular verb		
-d	31	16
-ed	46	24
-ied	16	8
Irregular verbs		
Stem modification	49	25
Omission of end past tense marker (-t, -id)	19	10
Omission of internal vowel	32	17
Total	**193**	**100**

Therefore, the percentage of those that committed errors of omission is:

$\frac{193}{348} \times \frac{100}{1} = 55.5\%$

Error of addition

This relates to the presence of an item that must not appear in well-formed utterances. Some students erroneously added redundant morphemes to form the SPT. Addition errors noticed in the data occurred only in irregular verbs under the subheads—addition of redundant morpheme and double marking:

Addition of redundant morpheme in irregular verbs with zero past tense marker

Extract 13: *The tyre of the vehicle *bursted* (burst)

Extract 14: *I *costed the things …* (cost)

Extracts 13 and 14 are some of the instances of addition of redundant morpheme in irregular verbs with zero past tense markers. The verbs ‘‘burst’’ and ‘‘cost’’ are irregular verbs which have the same form both in the present and past tense forms.

Use of double marker in irregular verbs

Extract 15: *Someone *stoled the phone …* (stole)

Extract 16: *She *tooked my bag …* (took)

Extracts 15 and 16 are examples of the use of double past tense marker by some students. The verbs ‘‘steal’’ and ‘‘take’’ are irregular verbs. Their SPT forms entail internal vowel modification to give ‘‘stole’’ and ‘‘took’’; but the students applied the rule for regular verb SPT formation to the irregular verb form.

Table 2: Items erroneously added, number of students and percentages

Item added	**Number of students**	**Percentage (%)**
Irregular verbs		
Redundant past tense marker	14	74
Double marker	5	26
Total	**19**	**100**

Therefore, the percentage of those that added wrong items is:
$\frac{19}{348} \times \frac{100}{1} = 5.5\%$

Error of mis-selection of morpheme

Error of mis-selection relates to the use of the wrong form of morpheme or structure in forming the SPT. Under error of mis-selection, there are: wrong inflection of regular verb, wrong inflection of irregular verb, wrong selection of the ‘‘be’’ verb, and outright mis-selection of word. They are presented in turns below:

Wrong inflection of regular verbs

Extract 17: *It *seems as if …* (seemed)
Extract 18: *My friend *invites us to …* (invited)
Extracts 17 and 18 are instances of the selection of the wrong morpheme by some students to mark the SPT in regular verbs. In these instances, instead of ‘‘ed’’ the students used the present tense marker ‘‘s’’.

Wrong inflection of irregular verb

Extract 19: *As I *leaved Kaduna …* (left)
Extract 19 is an instance of the mis-selection of the past tense marker for the irregular verb. This is a case of the misapplication of the rule of the SPT formation for regular verbs on irregular verb.

Wrong selection of the past tense form of the 'be' verb
Extract 20**:** *The journey *is not very far …* **(**was**)**
Extract 21**:** *I saw 2:00 pm I *am going to write …* (was)
The ''be'' verbs are part of the irregular verbs in English which mark their past tense form through outright change of the base form. The correct form of the past tense wrongly selected in extracts 20 and 21 is ''was''.

Outright mis-selection of word
Extract 22: *In 2017 when I *fell to gain admission …* (failed)
Extract 23: *The Federal Road Safety Corps that *safe our life …* (saved)

Extracts 22 and 23 are examples of the outright mis-selection of words. The two words out rightly mis-selected are not the base words which the students ought to have used. The right words are ''failed'' and ''saved'' respectively.

Table 3: Items mis-selected, number of students and percentages

Area of mis-selection	**Number of students**	**Percentage (%)**
Wrong inflection of regular verbs	54	40
Wrong inflection of irregular verb	10	7
Wrong selection of the past tense form of the 'be' verb	61	45
Outright mis-selection of word	11	8
Total	**136**	**100**

Therefore, the percentage of those mis-selected wrong items is:
$\frac{136}{348} \times \frac{100}{1} = 39\%$

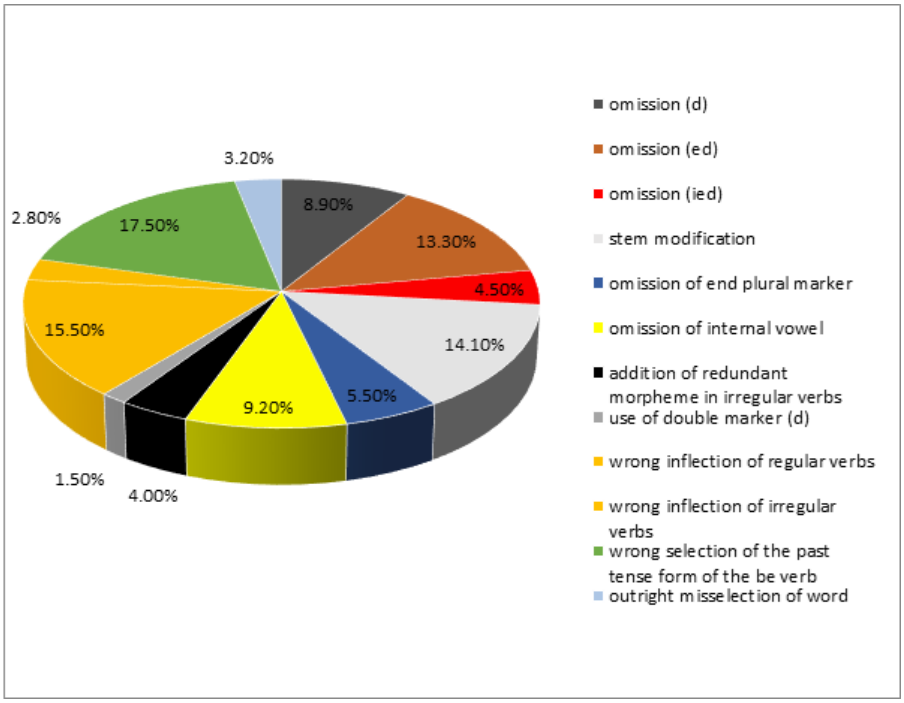

Figure 1: A summary of the errors and corresponding percentages (total percentage is 100)

From the chart, the SPT mostly used erroneously is in the omission category. Under the omission category, 31 students omitted ‘‘–d’’ (16%), 46 students omitted ‘‘–ed’’ (24%), 16 students omitted ‘‘–ied’’ (8%), 49 students modified the stem (25%), 19 students omitted the end past tense marker ‘‘–t’’, and ‘‘–id’’ (10%), 32 students omitted the internal vowel (17%). The percentage of students that omitted items is 193 students divided by the total number of students which is 348, times 100 = **(55.5%).**

Addition errors have the least number of students, with a total number of 19 students, those that added redundant past tense marker 14 students (74%), those that used double marker 5 students (26%) giving 100%. The percentage of students that added erroneous is 19 students divided by the total number of students which is 348, times 100 = **(5.5%).**

Under the error of mis-selection, the ‘‘be’’ verb has the highest number of students— 61 giving 45%; this is followed by wrong inflection of regular verb with 54 students (40%). Wrong inflection of regular verbs and outright mis-selection of words have 10 students (7%) and 11 students (8%) respectively. The percentage of students that mis-selected items is 136 students divided by the total number of students which is 348, times 100 = **(39%).**

Findings

Findings show that the irregular verbs pose more problems for the students than the regular verbs. This is probably because there are no specific rules guiding the formation of SPT marker for irregular verbs in English. The reason for the errors could be attributed to fact that Nigerian languages which is the super-strate of the students is more stable in tense marking. The errors do not reflect the students’ LI; in other words, there is no visible interference from the LI on the students’ erroneous use of the SPT in their posts. This supports Al Tamimi (2006) and Brown’s (2007) assertion that interference from the learners' L1 is not the only cause for committing errors. The unstable nature of the past tense formation in English especially for irregular verbs can be fingered as the likely cause of the errors. In the area of addition of wrong morphemes, overgeneralization is a likely factor contributing to the students’ errors where the students create deviant structures on the basis of his/her experience of other structures in the L2. The Nigerian user who may have internalized the past tense marker in English as the addition of ‘‘–ed’’ to words, overgeneralizes by adding ‘‘–ed’’to verbs that take zero past tense marker. According to James (1998), in L2 acquisition, the less the learner knows about the target language, the more s/he is forced to draw upon any other prior knowledge s/he possesses.

The implication of the findings is that students are still unable to distinguish the base form of irregular verbs from the inflected SPT forms as revealed in their AOPs; their inability also to distinguish verbs with zero past tense marker as revealed by the data validate Richards (1971) claim that some errors emanate as a result of faulty

generalization where L2 speakers extend the rule of SPT marker for regular verbs to irregular verbs. This also tallies with Selinker's (2008) view that intra-lingual errors are those that are due to the target language independent of the user's L1.

Conclusions

Errors arise in a second language situation when the leaners are still at the learning stage of the language. The English language which is the target language has its own tense marking morphemes different from what is obtainable in Nigerian languages. Many users of English language have their first languages which have ways of marking past tense quite different from the English language. The young leaners of English language still have a long way to go in trying to grapple with the inconsistencies in tense usage which is common in the English language.

Recommendation

To mitigate the findings of this study, it is recommended that prompts be built in in asynchronous online discussion platforms which ensures leaners use the right past tense form of verbs in their posts. This will help leaners communicate emerging ideas and knowledge to the community of learners, and also sustain leaners' interest in their post on the asynchronous online platform. The prompts will act as aid for learners, thus providing them with the technological and pedagogical support to meet their educational needs for professional development.

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Commentary:

Contributions of Open and Distance Education to the Social-Political and Economic Development of Africa

Graduation Lecture delivered at the
41st Graduation Ceremony of the Open University of Tanzania on
Thursday November 24, 2022

Olufemi Peters
Vice-Chancellor
National Open University of Nigeria,
Abuja, Nigeria

The Visitor to the Open University of Tanzania;
Distinguished Chancellor of the Open University of Tanzania, The Hon. Mizengo Kayanza Pinda;
The Pro-Chancellor, Open University of Tanzania;
The Vice-Chancellor, Professor Elifas Tozo Bisanda;
Other University Vice-Chancellors and Heads of Institutions present;
The Deputy Vice-Chancellors, Deans and Faculty Members;
Distinguished Guests;
Dear Parents of Graduating Students;
The Successful Graduands of the Day;
Members of the Press
Distinguished Ladies and Gentlemen.

Introduction

It gives me great pleasure to be in your midst today, over 4,000 kms away from Abuja, Nigeria. I want to thank the Vice-Chancellor of the Open University of Tanzania, Professor Elifas Tozo Bisanda for the honour accorded me to deliver the keynote address at this 41st Graduation ceremony of the University. He broached the idea briefly, during our most recent encounter at the 44th Executive Board meeting of the Africa Council for Distance Education (ACDE) held at the University of South Africa (UNISA), in Pretoria. He said much more. His promise of a tour of some wonderful landmarks as well as the natural allures of the Republic of Tanzania, and the hospitality of the people was indeed exciting. However, I soon returned to the dynamics of university administration in Abuja and could not luxuriate further in the world of those exciting promises until I received a formal invitation from him, some weeks ago.

Professor Bisanda has been around for a long time in the ODL landscape in Africa and especially in Tanzania, where he has assumed the status of a colossus in open and distance learning. An Engineer by profession, he has since transited like many of us into the open and distance learning realm. In the Invitation, I was required to speak on the ‘‘Contributions of Open and Distance Education in the Social-Political and Economic Development of Africa’’.

But, first, I bring warm greetings from the Council, Management and Senate of the National Open University of Nigeria (NOUN), Abuja. We viewed this invitation very warmly as a sign of brotherliness that we seek to entrench between peoples of Africa in general, and more especially between the faculties of ODL practitioners and our two institutions. The slogan in my country, Nigeria for this type of gesture is to retort that ‘*we shall certainly retaliate*’.

I have visited Tanzania in the past; to Dar-es-Salam and Arusha, at two different times on issues bordering on open and distance learning, but this is my first time in Mwanza, the city hosting the Convocation ceremony this year. Please believe me when I say that I found this city fascinating. Stooping down from the air, what we saw are mountainous

hills interspersed with green vegetations, and the beautiful view of the world- famous Lake Victoria. I eagerly anticipated landing to breathe in the air. It reminds me of the central Plateau region in my country.

Let me now congratulate the students that are graduating today. This must be a great day for you and your parents, families and friends. For some of you, it is another laurel added; but to the green ones, this must certainly be a day of joy. It certainly is the completion of a new phase in your life. The Open University of Tanzania, which was established in 1992 has really come of age. The world has moved a notch higher in manner and approach of the delivery of education. We now live in a time of far-reaching changes, and your university, OUT, is at the forefront. It is fantastic to note that the tools that they have used for delivery of your teaching are becoming the globally accepted form of instructional delivery. Yet some few years ago, it was still being looked at with some suspicion. Thanks to the global experience of the COVID 19 pandemic, there is a convergence of delivery methods. You can raise your heads further high. My prayer is that you will find favour in whatever you lay your hands, after this graduation.

A cursory look at this topic will show us that this is a very broad topic. But for the mindfulness of not taking too much time from the graduating students, who are expectedly eager to collect their certificates after the rigorous exercise of self-directed learning and to start reaping from the newly acquired competencies and skills, I could say we will be seated here for the whole day. Actually, the broadness of the topic is itself a good context as it gave me the latitude to situate my discussion within a specified scope.

Does Africa Need Open and Distance Learning?

To address the topic given to me, there is but a pertinent question to ask. Does Africa really need Open and Distance Learning? This question is very germane as it seeks to put emphasis on the rationale for the scope of our discussion today.

To many people outside the continent, Africa had always been a metaphor of contrasting issues. To the West who had the exploitative

conquest of Africa, Africa is known as a continent in a perpetual state of chaos manifesting prolonged crises of governance. Political instability, bad governance and chronic internecine conflicts had been known to plague many countries for several years. Even now that most countries have taken to the ideal of democracy, there is still as much perception of unorganised administrative malfeasance in all our human endeavours. Poverty and malnutrition still have manifest visibilities on human life. Except for the miraculously low occurrence of the COVID-19 pandemic, Africa had always carried the top spot in human frailties. HIV/AIDS pandemic, Ebola, and ethnic cleansing have all connived in claiming the lives of many people in the continent and made Africa the unenviable dark continent of the world.

The result of these malfeasances in governance is the downward trend and, in some cases, a total absence of social provision of services such as health, education, and housing except for farming which was thriving, but only at the subsistence levels within the continent. According to the Food and Agricultural Organisation, about 265 million people in Africa are hungry and poor (living on less than 1800 calories per day). If we add these to corrupt practices of governance by the persons in government, it would be clear that no developmental indices could be gauged as satisfactory in many countries in sub-Saharan Africa.

The response from the rest of the world was that, aid, came in from donor countries to alleviate the growing inadequacies in all human indices. In fact, at one time in our history, the World Bank and the IMF virtually ran the economic policies of the debt-ridden continent, recommending regimens of budgetary belt-tightening known technically as the Structural Adjustment Programme.

Amongst the social indices of living, and because somehow people still had access to traditional medical practitioners and rural housing; education, as always, took the bulk of budget cuts with the attendant consequences. School systems in our continent have not been well funded and incentivized, with higher education and universities bearing the brunt of the challenges. What the rest of the world especially the western countries through their institutions of

intervention did was to rightly focus on redeeming the worsening state of education. This they did by focusing rather on the provision of primary education. So, the World Bank, International organizations like UNESCO and several rich countries had stepped in with aid packages according to what they thought could help the continent of Africa.

The challenges of the Education For All (EFA) and the Millennium Development Goals (MDGs) which lapsed at the turn of the century, and more recently, the Sustainable Development Goals (SDGs) which came into force in 2015, make obvious the need to tackle the problems of poverty, poor governance, economic and social insecurity, and inter-ethnic conflagration, inter-religious wars, poor working conditions and the continuing exploitation of the human populace by her leaders and foreign countries. It became clear that to revive African democracies and upscale their development, Africa needed a new strategy which aimed at educating the people of Africa for Africans.

Hitherto, in modern Sub-Saharan African societies, the major agent affecting the process of education has been the traditional education system, whose distinguishing features are face-to-face interaction between teachers and students, structured courses of study, fixed locations for learning, fixed timetables, and a system of certification. Many nations throughout Africa realised the paramount significance of formal education and made very serious efforts to provide human and material resources for the purposes of educating the citizenry in this way. However, for various important reasons, many of the countries in Africa have not been able to fulfill the promise of providing education to the entire population through the conventional education system. Indeed, many reports indicate that Africa is still far behind other regions of the world at all levels of educational development. The direct implication of this scenario is that Africa is less competitive, less resourceful, and ill-equipped to assert itself in the global community. All these demands that education in Africa must be stepped up if the continent is to realise its potential.

Returning to the original question, ***Does Africa need Open and Distance Learning?*** It is clearly an important question to consider in

our quest to aggregate the contributions of ODL to the socioeconomic development of Africa. Since the realisation that whatever development strategies Africa designs, it must be dependent upon skilled human power it will be able to create. It became clear that the conventional residential educational delivery institutions alone cannot create such quantum of human capital as quickly as Africa needs it. Africa does need to deploy distance education.

The weaknesses of the conventional education systems are best crystallised by the notion of the iron triangle of education. The iron triangle of education describes the relationships between the vectors of access, quality and cost in education. Within the formal, campus-based education systems, it is almost impossible to increase access, without a consequential increase in cost and potential decrease in quality. It is also impossible to increase cost without a consequential decrease in access, as demonstrated by the number of people admitted into the system. The examples of expensive elite universities that admit a limited number of students per annum, to provide them with 'quality' education and training demonstrate that quality and access are not compatible entities in a conventional higher education system. Indeed, only an infinitesimal percentage of applicants are able to gain entrance into such conventional universities. A good example is that of Nigeria. The table below shows the gap existing between demand for university education and supply.

Table 1: University Admissions in Nigeria

S/N	Academic Session	Total Application	Total Admissions	Unsuccessful	% Unsuccessful	Noun Admission	NOUN Tot. Adms
1	2017	1,882,559	582,943	1,299,616	69	48,283	8.28
2	2018	1,793,018	588,085	1,204,933	67	48,250	8.20
3	2019	1,989,682	629,651	1,360,031	68	51,001	8.10
4	2020	2,110,623	596,718	1,513,905	72	48,233	8.08
5	2021	1,428,209	605,385	822,824	58	53,313	8.81

Source: National Bureau of Statistics 2018 and Joint Admissions and Matriculation Board 2022

Yet, according to UN estimates, the population of humans on this planet reached an estimated 8 billion people by the 15th of November (UNDESA 2022). What is of interest to us is that "more than half of the projected increase in global population up to 2050 will be concentrated in just eight countries: ***the Democratic Republic of the Congo, Egypt, Ethiopia****, India,* ***Nigeria****, Pakistan, the Philippines and* ***the United Republic of Tanzania****…*" (UNDESA 2022, p.9). This projection illustrates the fact that African countries are expected to contribute more than half of the global population increase anticipated through 2050. The implications of these social realities on the education sector are clear to a careful observer. With an increasing population comes an increasing demand for basic and secondary education, and of course, higher education. The development and growth of higher education systems in terms of participation rates in many parts of the world have been very rapid in response to the population growth rate. However, while the technologically advanced countries are boasting about 70-80% (89% for the USA in 2009) participation rates, BRICS average 37.5%, while Africa lags at around 9.4% (Webbstock 2016).

While Africa accounts for only about 16% of the world's total population estimates, more than 65% of the African population is between 16-35 years of age. This makes Africa the continent with the highest population of young people. The problems that have faced many African nations and prevented them from pivoting into the class of the most developed regions of the world include severe brain drain, where the most qualified medical practitioners and data scientists are in flight out of the continent; economic inadequacy, as most national economies cannot sustain the growth of their countries; internecine wars occasioned by social unrest and insurgencies.

It is in this context that distance education can be viewed as an appropriate method of delivery of education that could mitigate the illiteracy and enlightenment level of the masses of people in the content.

Originally, distance education was aimed at providing people who have missed an educational opportunity at one level or another a way to

recapture what they have lost without necessarily going back to the four walls of a brick-and-mortar classroom. In other words, distance education was designed to provide people with a second chance to receive an education. But as we shall see later, *the raison d'etre* has since changed in modern-day living.

Early distance education endeavours in Africa covered a range of applications, from formal degree programmes offered by the University of South Africa (UNISA) from 1946 onwards to a broadly based adult education campaign conducted by the Institute of Adult Education at the University of Tanzania during the 1960s. Initially, UNISA relied mainly on printed materials issued in the "correspondence" model with minimal contact, while the Tanzanian project used a combination of radio, printed pamphlets and community-based group work.

Community and adult Education programmes through distance education using radio were very common in several counties in Africa. The INADES Foundation, established in 1962 in Cote d'Ivoire as a private initiative was later extended to Burkina Faso, Togo, the Democratic Republic of Congo, Cameroon, Burundi, Chad, Rwanda and Zaire (this was initially confined to these French-speaking Africa), and Ethiopia and Kenya. The programmes offered by the INADES Foundation were mainly in Agriculture and allied fields. It also helped local communities engage in development initiatives through project formulation, etc. More recent projects covered a similar range of target audiences and programme types, with one of the most significant changes over the modes, as more and more ICT options became available. Interactive Radio Instruction (IRI) and community radio were the major instruments that helped this growth.

Distance learning is already being used to train large number of teachers for primary, secondary and tertiary levels in Africa. It is estimated that distance learning institutions are in existence in 34 African countries. In the forefront of these efforts are countries of South Africa, Kenya, Tanzania, Nigeria, Ghana, Ethiopia, Malawi, Zambia, Rwanda and Zimbabwe which have been utilizing distance education programmes for decades. In recent years, rapid

developments in internet technology have given rise to the possibility of instructional competency based on the idea of lifelong learning independent of the physical distance to a particular educational institution.

Overall, therefore, research has been reported to the effect that using DE may help solve the problem of the Sub-Saharan Africa (Arger, 1990) by utilizing its comparative advantage through the following:

a) Avoid the opportunity cost of taking people out of their normal employment for training
b) Reach a large number of individuals
c) Democratise education – by widening access and participation
d) Raise educational standards through the use of high-quality materials
e) Be cost-effective and more efficient than traditional college campus-based educational systems.

In keeping with its developmental aspirations for the continent, the African Union embarked on ***Agenda 2063, The Africa We Want***, which envisions "a long-term 50-year development trajectory due to ongoing structural transformations; increased peace and reduction in the number of conflicts; renewed economic growth and social progress; the need for people-centred development, gender equality and youth empowerment; changing global contexts such as increased globalization and the ICT revolution; the increased unity of Africa which makes it a global power to be reckoned with and capable of rallying support around its own common agenda; and emerging development and investment opportunities in areas such as agri-business, infrastructure development, health and education as well as the value addition in African commodities".

To achieve this dream and turn it into reality, various countries turned to a responsive model of education that is geared towards mass access to all Africans irrespective of their geopolitical locations, political affiliations, economic capabilities, levels of preparedness, gender, age, race or disability status. This is where open and distance learning and its recent manifestations in form of digital education and online

learning became the *sine qua non* for achieving Africa's development agenda in this second decade of the 21st century.

The Prognosis: Now that Africa has embraced ODL

The concept and practice of ODL in Africa has come of age since the emergence of the University of South Africa as the first distance teaching university, and perhaps the first distance education institution in the world.

One of the foremost harbingers of DE to Africa was the International Extension College. This College provided advice and support in distance education and flexible learning to many African countries at independence. Over a period of 35 years, IEC was instrumental in supporting the establishment of organisations such as the South African Institute of Distance Education, Sudan Open Learning Organisation, South African Extension Unit, Lesotho Distance Teaching Centre, Botswana Extension College, Malawi College of Distance Education, Mauritius College of the Air, the Namibian Extension Unit and the Women in Fisheries Industries Project. Many of these organisations later metamorphosised into distance higher education institutions in their respective countries. Over the past forty years a number of open universities, distance higher education colleges and institutions have now been established on the African continent.

There are presently more than 20 open universities on the African continent and over 100 distance teaching centres that are part of existing campus-based institutions (ACDE 2022). The South African experience with distance education is one of the most successful on the African continent. Apart from the University of South Africa, which is a dedicated ODeL institution, many other universities in South Africa also offer structured distance education programmes as part of their institutional arrangement. Indeed, these distance education centres and UNISA account for over 50% of all registered university students in South Africa as at 2020.

Table 2: Number of Students Enrolled in Public HEIs in South Africa, by attendance mode, 2019

Institution	Contact Total	Distance Total
Cape Peninsula University of Technology	33,475	466
University of cape Town	28,603	38
Central University of Technology, Free State	21,225	0
Durban University of Technology	35,442	0
University of Fort Hare	16,982	0
University of the Free State	37,075	430
University of Johannesburg	50,064	526
University of Limpopo	21,490	0
Mangosuthu University of Technology	14,328	0
University of Mpumalanga	3,471	0
Nelson Mandela University	29,478	12
North West University	44,647	19,024
University of Pretoria	48,943	1,651
Rhodes University	8,247	0
Sefako Makgatho Health Science University	6,456	0
Sol Plaatje University, Northern Cape	1,994	0
University of South Africa	0	342,797
University of Stellenbosch	31,523	0
Tshwane University of Technology	66,552	1,121
University of Venda	16,783	0
Vaal University of Technology	21,927	0
Walter Sisulu University	33,572	0
University of Western Cape	23,784	0
University of Witwatersrand	40,710	180
University of Zululand	17,738	0
Total	**704,021**	**370,891**

Source: National ODL Policy & Practice in the Commonwealth, 2021

The Republic of Tanzania was not also left out, as Salum R. Mnjagila noted in his paper, *Tanzania Open and Distance Learning for out-school-youth*, the National Correspondence Institute (NCI) commenced distance education under the University College of Dar es Salaam in 1969, to serve underprivileged literate, but isolated youth throughout the country with the aim of expending access to education to all. The Republic of Tanzania has since established ODL institutions at various levels including the Institute of Adult Education (IAE) at the NCI, Tanzania Global Learning Agency (TGLA), Tanzania Institute of Education, Moshi University Cooperative and Business Studies, International Education Centre (IEC). The Tanzania Open University came into force in 1992. Whilst ODL penetration had remained mostly at higher educational level in most SSA countries, Tanzania had gone further to deepen it. Mnjagila noted that the ODE target included primary school leavers who were not absorbed in the formal secondary education system, primary and secondary education drop-outs, government and private sector employees who had no secondary education, adult learners who aspire to acquire professional skills and disadvantaged and marginalised groups.

Ditto, in Nigeria where I come from. The National Open University of Nigeria (NOUN) was established in 1983 to drive the ODL revolution in Nigeria. The primary objective was to provide access to a wider population of higher education seekers which were hitherto denied by the limitations of the conventional university system. Unfortunately, NOU was closed down in 1984 and licensing of private conventional universities became the favoured alternative, with the hope that these would complement and ameliorate the inadequacies of their public counterparts. As access gaps remained and expanded further, this led to the resuscitation of the National Open University of Nigeria (NOUN) in 2002. Also, the National Teachers Institute, another single mode institution was established in 1978 to increase the production of professional teachers, as well as, to enhance and increase their training for the universal basic education programme in Nigerian schools. The Institute offers National Certificate in Education, Bachelor's degree and postgraduate diploma in education programmes through the distance learning system. But before NOUN and NTI, there had been a form of DE offered by the University of Lagos, Lagos through her

Correspondence Institute and the Ahmadu Bello University Institute of Educations' Adult learning programmes. Of recent, the Nigeria University regulatory commission has now licensed 17 conventional universities, including 4 privately owned universities to commence offering education through the ODeL mode.

Many other African countries have since followed the oldest distance education university in Africa, the UNISA. The Zimbabwe Open University was established in 1999 while the Sudan and Zambia Open Universities were also established in 2002. The Open University of Zambia came into existence in 2004, and that of Mauritius in 2010. It therefore became imperative for an African continental agency to be established to bring all these universities and non - tertiary providers of ODeL under an umbrella. The African Council on Distance Education was established in 2004 as a coordinating agency for distance education practice in Africa. The Council has over 34 members providing distance education on the African continent.

Open and distance education as it is being practiced today will not be the same in the next five years. Just as traditional universities will no longer be merely conventional and campus-based. They are already embracing features of flexibility and remote teaching and learning by leveraging on emerging eLearning solutions. Being flexible in nature, open and distance learning institutions would lead the way, becoming universities of convergence, and fully engaged in networked learning. We are already witnessing this in our various institutions. Even though the use of traditional technologies of ODL in form of print and audio-visuals will continue to hold sway to meet the needs of the most indigent and disadvantaged learners. The growth of ICTs has made digital learning through computing and mobile technologies the order of the day, enabling distance learners to review, speed up or substitute some or all of what normally occurs in conventional university classrooms or traditional distance learning textual materials through electronic links. Thus, technology is bringing about a fundamental change in the very structure of higher education and open, distance and digital learning is the major driver of this change if policymakers are willing to accept this analysis.

What then are the contributions of Open and Distance Education to the Socio-Economic Development in Africa?

We have affirmatively answered the question that Africa indeed needs open and distance learning and explored its trajectory on the continent over the past few decades. The next logical question is to examine the contributions of ODE to the socio-economic development of Africa? The frequency of this sort of question is instructive. It calls attention to the weight of expectations placed on distance learning institutions. The expectation is that distance education, if it must be relevant, must serve as a one-stop solution for all the ills of the conventional system. Thus, if the conventional mode of university education is criticised for its failure to ensure adequate access, quality, relevance, cost, and governance (Odekunle, 2014), open and distance learning institutions are viewed as possessing the magic wands to solve all the problems.

a) Improved Access to Education

Many African nations started to employ open and distance learning strategies as tools to accelerate the pace of educational development within their borders especially to meet the various international set goals such as the MDGs and the SDGs on education of various international agreements on education especially since the early 70s.

Teacher Education: This process of massification was first directed towards the Training of Teachers before it was pointed towards other areas of teaching and learning. For example, Nigeria, Kenya, Malawi, and Botswana in 1976, 1986, 1992 and 1994 set up ODL programmes to train massive and staggering numbers of teachers to enable them prosecute their respective universal primary education programmes (Kamau, 2009; Rumajogee, Jeeroburkhan, Mohadeb and Mooneesamy, 2003). In one year alone (2004), Nigeria produced through its ODL programme, 10,629 trained teachers compared with 30,000 trained teachers produced in 2003 by all the existing government and private teacher training colleges in the country.

Within three years of the commencement of its teacher training programme by ODL, Malawi produced 18,000 trained teachers; normally, it would have taken all Malawi teacher training colleges an estimated 12 years to produce this number of teachers through the

campus-based method of training. Also Botswana and Kenya produced huge numbers of trained teachers within a short time which colleges of education in those countries would have rolled out not only at prohibitive costs but also after many years of teaching and training (Kamau, 2009; Rumajogee, Jeeroburkhan, Mohadeb and Mooneesamy, 2003).

School Enrolment: ODL has indeed increased school enrolment across Sub-Saharan Africa. In Tanzania for example, the establishment of the NCI led to increased enrollment in secondary education through ODL from 6,709 learners in 2007 to 12,345 in 2012. Also, the Open University of Tanzania increased its enrollment from 11,356 learners in 2000 to 68,969 in 2012 (Mnjagila 2012). According to the African Council for Distance Education (ACDE), when a cumulative students' enrolment of 92,568 was reached by OUT, this qualified OUT as the largest tertiary institution in Tanzania.

ODL is considered an important new approach in attempting to resolve the problems of access, quality and equity (SADC, 2009). Mkwizu and Ngaruko in a paper titled *Implied Benefits of Open and Distance Learning in Tanzania* noted that the Open University of Tanzania (OUT) had students' accumulative enrollment of 147,238 from 1994 to 2018/2019 (OUT, 2019), and University of South Africa in South Africa with students enrollment of 350,775 in 2014 to 381,483 in 2018 (UNISA, 2019). They noted therefore, that many people of the respective countries ODL benefited from expanded access to higher education.

Analysis of available statistics in the past 5 years shows that conventional Nigerian universities have consistently granted university admission to less than 50% of candidates that seek admission in them. Below is a table showing application and admission of candidates into Nigerian universities.

Academic Session	Total Enrollment (UG + PG)		Total	% Female	NOUN Enrollment (UG + PG)		Total	NOUN % TOTAL	% Female
	Male	Female			Male	Female			
2017	1,099,921	834,642	1,934,563	43	264,496	206,265	470,761	24	44
2018	1,160,928	880,363	2,041,291	43	287,540	226,620	514,160	25	44
2019	1,227,939	931,523	2,159,462	43	312,654	252,731	565,385	26	45
2020	1,211,831	950,187	2,162,018	44	322,175	259,774	581,949	27	45

Table 3: University Enrollment in Nigeria
Source: National Universities Commission – NUC – Statistical Digest / State of University Education in Nigeria

From the data above, it is clear that NOUN alone offers admission to about 25% of students admitted in Nigeria's over 150 public and private universities.

With the challenges of carrying-capacity confronting conventional universities as evidenced by the above comparative analysis, you will agree with me that the projections of Nigeria's education planners for open and distance education as a remedy were not misplaced. In addition to its involvement in the pursuit of general goals of education in Nigeria, planners evolved some specific objectives for open and distance education. These include among others, the need to provide more access to ***quality education and equity in educational opportunities.***

b) Cultural and Religious Enhancement

Most African cultures regard the role of women as primarily that of a home-keeper. Women are therefore, usually unable to leave their spouse and children to travel away to a conventional university system where they can pursue the much-craved training, skills development and education. Women in this category require distance education, since it allows them to sit at home and study for a programme without jeopardizing their marriages or leaving their children without much adequate attention. The issue of women's education is essential for

rural development and women are not well equipped to contribute their useful quota to society because of illiteracy (Azikiwe 1992).

Another group of women that are denied the access to formal education because of their adherence to the Islamic practice of Purdah. These women can only have access to qualitative education through the open and distance learning approach that allows them to pursue their education at a 'safe distance' from the instructors. They can study, turn in assignments and write examinations after adequate arrangements have been made. A woman in purdah can be trained and given the opportunity to contribute her own quota to national development without disobeying any of the injunctions of her religion. Distance education is an alternative that affords this group of women access to quality study materials on any field of their choice without any of the barriers associated with the conventional system and her religious dedication.

The African nomadic people are yet another group excluded by the conventional mode of higher education. These include the Maasai of Kenya and Tanzania; the Hausa/Fulani herdsmen of West and Central Africa and the migrant fisher-people of Nigeria's Niger delta. The social dictates and vocational practices of people in these nomadic societies require that they be always constantly on the move, often with their families, for subsistence or trading. For generations, they were denied access to quality education due to the peripatetic nature of their livelihood. However, with the ODL system, they can remain in their preferred social environments yet have access to qualitative education.

c) Educated citizenry matter in leadership and governance

One of the major outcomes of democratization of education through ODL is the development of a critical mass of educated citizenry that is increasingly available to be harnessed for political leadership in Africa.

One of the most accepted findings in governance and economics is the importance of education in explaining economic outcomes pointing to overwhelming evidence that education affects governance and earnings. Recent literature reports significant effects of political leaders in driving economic policies for the fact that they are

educationally empowered. Yang Yao et al (2020) indeed argue that educational background and attainment play an important role in shaping leaders' ideas and beliefs, which in turn matter for policymaking in the long run.

Given the extent of higher education's benefits to society, gaps in access to higher are matters of great significance to a country as a whole. Higher education institutions assure the relevance of their knowledge, identify skills gaps, create special programmes and build the right skills that can help countries improve economic prosperity and social cohesion, adapt workforce development to the economy and changing demand for the new skills, develop relevant policies.

Open and Distance Learning has provided continuing education that suits the schedule of senior employees needing additional qualifications or special programmes to improve their competencies on the job. This category of personnel in the public service and private organizations whose presence are critical to corporate stability/continuity cannot be released to, and are not able to adapt to, the strict schedule of face-to-face learning in conventional universities. The ODL system has been a veritable avenue for improving competencies in the top echelons of the public service and private organizations across many African countries.

Many captains of industry in Africa today joined their organizations after secondary education and have had to acquire additional education and qualifications from open and distance learning institutions. They proceeded to senior management and eventually to lead their organisations, and become inspirational examples to the younger generation of employees and citizens of their countries.

For example, the Alumni of the University of South Africa (UNISA – one of the leading open and distance learning universities on the continent) comprise at least two former Heads of Government and several serving and current Ministers in different countries in the Southern Africa sub-region. This is equally true of Nigeria, where a former president is an alumnus of NOUN and several past and serving legislators are numbered among NOUN alumni and students. It is

therefore a truism that open and distance learning contributes in significant ways to the development of leadership for political governance.

d) Meeting Special Social Needs

Besides the flexibility of time and space that distance learning provides to students, the adaptability of programmes is one major contribution which distance learning provides to society. By flexibility of programmes I mean, the freedom of distance learning to design courses that meet the specific needs of markets, instead of heavy reliance on established curriculum as is the practice in conventional institutions. In the National Open University of Nigeria, for instance, we have designed courses for a number of professional associations, private and public companies leading to award of certificates. Such courses take into account the specific Nigerian environment in which the professionals operate. In such programmes, the target is to impart and sharpen the ability of individuals to make use of acquired skills.

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e) Special Education Needs

Given the fact that people living with disability constitute about 20% of the global population, it is essential that the educational needs of this cohort of learners form an important part of the educational planning process. In a recent survey of the various disabilities and impairments found among NOUN students, 184 students reported various impairments including, Visual Impairment, Deaf or hard of hearing,

Mobility Impairment, Autism Spectrum Disorder, and Mental Health Conditions. The fact that these learners are actively engaged in their programmes with no reported restriction is evidence that open and distance learning is amenable to the needs and lived experiences of people with disabilities.

At the National Open University of Nigeria, arrangements are made for special needs candidates. Through ODL, we have further enhanced inclusiveness in socio-economic development of our people by enabling special needs candidates (e.g. the hard of hearing, the blind and mobility impaired) to acquire skills and learn at their own pace and convenience. This has led to their being empowered to make a more decent living than they would ordinarily have had.

f) Leadership Development

Given the extent of higher education's benefits to society, gaps in access to higher are matters of great significance to the country. Higher education institutions assure the relevance of their knowledge, identify skills gaps, create special programmes and build the right skills that can help countries improve economic prosperity and social cohesion, adapt workforce development to the economy and changing demand for the new skills, develop relevant policies. Societal benefits include: Higher levels of education correspond to **lower levels of unemployment and poverty**, so in addition to contributing more to tax revenues than others do, citizens with higher levels of education are less likely to depend on social safety-net programs, generating decreased demand on public budgets. Given the extent of higher education's benefits to society, gaps in access to university education are matters of great significance to the country as a whole.

Open and Distance Learning is more readily suited to the schedule of senior employees needing additional qualifications or special programmes to improve their competencies on the job. This category of personnel in the public service and private organisations whose presence are critical to corporate stability/continuity cannot be released to, and are not able to adapt to, the strict schedule of face-to-face learning in conventional universities. The ODL system has been a veritable avenue for improving competencies in the top echelons of the

public service and in private organisations. Also, many captains of industry in Africa today joined their organisations after secondary education and have had to acquire additional education and qualifications from open and distance learning institutions. They proceeded to senior management and eventually to lead their organisations, and become inspirational examples to the younger generation of employees and citizens of their countries.

g) Vocational Training and Promotion of Entrepreneurship

Open and distance learning has enabled many African entrepreneurs who cannot afford to leave their businesses for the four walls of conventional higher institutions, to acquire much-needed managerial and entrepreneurship training to lead their organisations successfully. Today we have many homegrown African entrepreneurial success stories as examples.

h) Self-Discipline and Distance Learners

I cannot avoid commenting on an issue that is dear to my heart, as an important element of ODL and its relationship to sustainable development. As we are all aware, the ways in which the digital world is changing our day-to-day life is remarkable.

Online learning is a great opportunity for students to learn from anywhere with a single connection to the Internet. Still, there are some facts that could cause great trouble for students. Online learning requires students to get online login to certain websites for their lectures, assignments, and queries. The Internet itself is a temptation for the wastage of time. There are myriads of TV shows, games, social media groups, pop-ups, and many other disturbing technology tools. Therefore, a student is vulnerable to all kinds of negative and mischievous distractions which she may not be open to, within the regimented boundaries of conventional institutions and campus-based universities. To overcome this challenge, one needs to be self-disciplined and self-organised for distance and online learning. It is not difficult to follow the discipline that you are imposing on your own self. Understanding the responsibilities and burden that online education entails is critical to students developing their own disciplined and focused study plans.

Students must improve their self-discipline, avoid distractions, and manage their time effectively to excel in an online program. This can be an important carry-over to the wider society because once you have formed the habit of self-discipline and self-organisation as required for a successful distance learning experience, you will be able to transfer such skills to other vocations and responsibilities in life. It is on record that distance learning graduates are better at planning life.

i) Cultivating and Sustaining Lifelong Learning through ODL

Another critical area where ODL has contributed immensely to the advancement of the quality of life in Africa generally is in literacy and lifelong learning. Depending on the model adopted by the ODL institution, one of the major elements is the learner concept whose main business is to acquire knowledge and skills through self-effort. To do this they must cultivate the art of learning. Literacy through reading is an individual's ability to identify symbols and the connection of suitable meaning to them. It is a conscious attempt towards comprehending and obtaining knowledge. It is also a systematic, deliberate task of gaining precise knowledge geared towards a criterion (Kojo, Agyekum and Arthur, 2018).

Literacy also adds quality to life and provides access to culture and cultural heritage. Learning is an intellectual activity which is possible only if a person forms the habit of learning and practices these from childhood. Reading of books is the most suitable medium through which knowledge is transmitted from generation to generation (Issa et al., 2012).

Due to the mode of delivery in face-to-face institutions, which depend essentially on the teacher, an ODL student must cultivate the art of studying alone. They must develop a reading culture. Nkordeh et.al. (2017) described reading culture as the process of acquiring positive reading attitude among students and children over a length of time.

ODL through its development of the reading culture does not only increase our knowledge, but it also builds maturity and character,

sharpens our thinking, and widens our awareness in social, economic, political, and environmental issues. It also helps in mental development and is known to stimulate the muscles of the eyes. It is an irreplaceable weapon for all - round growth and the fulfillment of one's potential. Reading is the foundation upon which other academic skills are built. Reading is a very essential way of learning and achieving any global academic breakthrough (Hassen, 2016). It was asserted by Tella and Akande (2007) that the ability to read is at the heart of self-education and lifelong learning and that it is an art capable of transforming life and society.

j) Internalisation of the Higher Education Curricular

Studies show that there is a place for peaceful process of sharing information and knowledge as well as for collaboration for the purposes of knowledge generation among nations. Agents of this process include multinational corporations (Gupta and Govindarajan, 1991), global and regional organisations (like World Bank, UN, UNESCO, AU, etc.), and higher education institutions. Indeed, the UNESCO charter starts with the profound statement that "Since wars begin in the minds of men, it is in the minds of men that the defences of peace must be constructed." Without doubt education remains the most effective mechanism of peace and social development.

Scholars agree that sharing knowledge made possible by internationalisation improves the competitive advantage of nations, and avail them with world-class excellence, and flexibility to tackle challenges. (Jianbin, Yanli, and Kaibo, 2014). International and cross-border intellectual exchanges are not the exclusive preserve of conventional universities. But it is also understood that distance learning institutions must walk the extra mile if we are to escape the gaze of suspicion placed on us by the cautious public. We must be seen to do, what we say we do, in order to gain public confidence.

Perhaps because of their special nature and manner of developing their contents for instruction, ODL institutions in Africa have developed special partnerships to advance scholarship and enhance the visibility of the continent through engagement with bodies such as the Commonwealth of Learning (COL) Canada, International Council for

Distance Education (ICDE) Norway, African Council for Distance Education, Kenya, Association of Commonwealth Universities (ACU). Presently, the NOUN is one of the Technical Partners of the Association of Commonwealth Universities (ACU) Partnership for Enhanced Blended Learning in West Africa (PEBL WA). In this capacity, NOUN has engaged in training academics from 12 universities in the West Africa subregion in the adoption of blended learning techniques. In addition, over 3,000 students are being trained in special entrepreneurial skills and in the use of ICT to enhance their learning and their employability. This project which followed the success of an earlier version in East Africa is contributing immensely to the competence of African universities in the development and management of virtual learning environments and improved access to an even wider population of prospective learners.

Through collaborations and linkages, ODL institutions have established a working relationship for staff and student exchanges. As we speak, colleagues in various faculties are conducting benchmarking and study tours between NOUN and UNISA. We are also expecting colleagues from the Open University of Tanzania in December 2022. We have success stories of student exchanges between NOUN and UNISA and staff between the Indira Ghandi National Open University, (IGNOU), India and NOUN and continue to encourage such practices between our university and partner institutions. This has enriched knowledge, enhanced outlook beyond national boundaries and encouraged continuous re-imagination and search for solutions to African problems.

k) Enhancing Quality and Standards in Curricula

The ODL system requires development of learning materials, instructional videos and other teaching aids that gives the learner a feel of the education experience. These materials, including Open Educational Resources and Massive Open Online Courses (MOOCs) are often accessible to a wide range of institutional audiences where they are critiqued and assessed. This has led to the institution of quality in the content, production and use of such materials. Taking the example of the National Open University of Nigeria, the NOUN, is the resident institution for the ACDE Accreditation and Quality Assurance

Agency. The university is also the host institution for Africa's Focal Point for Quality on the ICDE Network. As with other ODL institutions in Africa, the NOUN study materials are available in the public domain and have been found to becoming the main resource of a number of other institutions to enrich their curricula and increase the body of knowledge in the various fields of study.

l) Ameliorating Brain Drain

Open and distance education reduces the effect of external and internal brain drain in tertiary institutions by utilizing home-grown experts as teachers regardless of their locations and places of work. By their nature of operations, ODL institutions do not require large resident pools of staff. They are able to leverage faculties in conventional and other ODL institutions for facilitation, tutorials and research collaborations. This enriches the curricula and breeds constant review and update of learning materials.

m) ICT Penetration in Education

Open and distance education as of necessity required the use of modern technologies to enable access for the hitherto unreached. In doing this, ODL institutions have taken the lead in ICT competence and penetration. For example, among Nigeria's public universities, the NOUN is easily the leading institution in the use of ICT for learning. This had been a tradition since inception of the university. In its annual statistical digests, the National Universities Commission had acknowledged NOUN as a leader in the use of ICT devices by both academics and students for teaching and learning in the country. I am sure similar testimonies abound in other African countries.

Undoubtedly, the place of ICT in the world of today cannot be over-emphasized. Therefore, we as ODL institutions have led the way in empowering the continent and its large youth population to be globally competitive, resourceful and creative in responding to the challenges of a fast-paced and dynamic world. During the Covid 19 pandemic, whilst conventional universities in Nigeria shut their doors to students and staff, many ODL institutions were able to continue to serve its large student population and conducted its examinations through proctoring

techniques. This ensured that there was no disruption in the academic calendar and students were able to graduate at the expected times.

According to various research, the challenges posed by deployment of technology by our institutions and the use of technology by our students have helped improved the critical thinking and problem-solving skills among our learners which are required in the 21st century. We have started to see our people develop alternative technology platforms *vis-a-viz* others platforms such as Google Docs, Discussion Forums in Blackboard and create various activities that can help to develop the critical skills of learners (Mansbach, 2015). We have to continue to encourage this skill and knowledge attainments.

n) Deepening Economic Value Chains

In developing access for wide spectrum of learners, ODL institutions have had to establish institutional presence in multiple locations called Study Centres. The UNISA in South Africa for instance operates from 3 main campuses, while the NOUN has 3 main campuses and over 100 study centres in Nigeria. The Open University of Tanzania also operates from over 30 regional centres in the country.

Perhaps the greatest area of influence of open and distance education is in the socio-cultural context of its presence in different places in any of the developing country and continent. I had alluded to this in the earlier part of this paper, that aligning with the mandate of widening access, is the concept of bringing the ***Gown to Town***. This is exemplified by the operations of our Study centres across the length and breadth of Nigeria. For a developing continent like Africa, the socio-economic importance of locating or siting an institution of learning (Study centre) in designated locations is immense, as exemplified by the city status conferred on such ‘‘towns’’ in which such schools as UNISA in Pretoria and OUT in Mwanza, (to mention a few) are situated. There have been substantial increases in the GDP of such cities as they relate to the social and economic services the students generate. The importance of this policy in community/rural development is invaluable. These centres have turned out to be beehives of economic activity and have encouraged the growth of local enterprise in their communities. This ranged from business centres that

attend to student learning and academic needs, retail hospitality - from food to accommodation, provision of security and transportation services, telecommunication, internet data services and extension of public utilities etc.

As a further fall-out, it helps to curb rural-urban migration that educational activities ordinarily generate. In addition, the presence of study centres in various locations have helped to create direct and indirect employment for both skilled and unskilled labour.

o) Encouraging Self-Directed and Lifelong Learning Opportunities

The ODL mode of education encourages self-directed learning which produces resilience in the individual learner. In the absence of physical contact, learners are encouraged to overcome the barriers of time and space, and therefore develop skills to interact with virtual environments through a host of modern technologies, course materials and learning aids. Learners are most often able to prepare and harmonize their thoughts ahead of tutorial classes wherein challenging topics are ironed out. This produces a higher level of understanding far ahead of the campus-based contact learner who most often is introduced to a subject in real time and probably takes time to have a grasp of concepts being taught. Also, ODL institutions by their very nature of flexibility have a high vocational content and are readily available to provide life-long learning for varied concepts in modules, for continuous development as well as adult education.

p) Entrepreneurship

Aderinoye and Ojokheta (2004) argued that employment generation is an important measure of national development. Many African countries and other countries world over, assessed their level of development based on the number of jobs created within a given period of time.

Employment generation is another aspect through which open and distance mode of education contributes to development of countries of the Africa. This mode of education makes an individual to be

productive and employable. Without education, it will be difficult for an individual to be gainfully employed especially into white collar jobs.

The remark of Dhanaraian (2001) confirmed that developed nations created more jobs for their citizen through education. He asserted that they make adequate efforts for their citizens to be educated and that some of them have been using open and distance learning programmes to prepare their citizens for employment. Standing (2014) in Tekeli and Gunsoy emphasizes the importance of education especially university and vocational education in women's employment and participation in the labour force. He emphasized that women who missed the chance to secure higher education due to poverty, oppression or marginalization can capitalize on the opportunity provided by distance education to acquire higher education and be gainfully employed into white collar jobs.

On the terrain of economic development aspect of national development of African countries, various Economists such as Onwe (2013) including other social scientists have attributed poverty to lack of education or illiteracy. Onwe opined that education is the driving force for eradicating extreme poverty from a nation. As remarked by Dhanaraian (2001), poverty is a significant signage of under-development of a nation and it is only education and skill acquisitions that can reduce or erased it.

Open and distance education overtime has shown that it is a significant tool to develop the human capital of a nation and reduce poverty. Aderinoye and Ojokheta (2004) posit that open and distance education create an opportunity for all citizens (both young and old) to acquire higher education and secure a profession that will enable them earn white collar jobs and defeat poverty.

Lastly and worthy to note is the fact that, open and distance education helps to reduce poverty level among workers of different categories as the mode of education enable them to upgrade their certificate to a higher level which will in turn earn them promotion and increase their salary structure for better and improved standard of living (Kaufman, Walkins and Guera, (2000) and Ojo ; Olakulehin; Olowola; Adeoye, &

Salawu, (2007). With the opportunity offered by the programmes offers through the open and distance education mode, individuals are able to acquire a profession which helps them to fight poverty and improve their economic status in the society. (Besong, 2014) observed that most people who partake in distance learning programmes of a distance institutions are working class people whose jobs cannot fetch them any reasonable of money that can enable them take good care of their family and extend hands to their relatives unless they improve their educational status. This category of persons embarked on this programme to acquire higher academic qualifications that will earn them promotion in their workplace and uplift them from poverty. Meanwhile, Dhanaraian (2001) posits that the desire to migrate from poverty to person of social status is the reason why many people who missed out on higher education purchase part-time forms and sandwich programme. Through these programmes, people have the chance to obtain university degree and compete with other intellectuals in the society. Khakhar (2001) opines that open and distance education is the most effective strategy to bridge the wide education gap and alleviate people from poverty and hunger.

Africa, what next for ODL Institutions?

Distinguished Ladies and Gentlemen, to answer this question, I share with you a few data from the 2020 Annual Report of the Africa Progress Group, a think-thank of African Elder Statesmen, chaired by Nigeria's former President, Chief Olusegun Obasanjo, below.

While ODL institutions have indeed made significant contributions in expanding access to education, our out-of-school rates are still significant in a lot of sub-Saharan African countries. The case of Nigeria (33.77) and Tanzania (39.72) are instructive. Perhaps due to the ever-growing youth population of sub-Saharan Africa, gross tertiary enrollment rates are still relatively low, despite growing adult education literacy.

ODL has emerged as a growing trend in the attempt to massively educate Africa and gaining wider popularity among Higher Education institutions in Africa.

In the 2020 report, the think-thank recommended among others that lessons learned from good performing countries include:

a) Expanding the opportunities for formal and *non-formal education provisions* to reach remote locations;
b) Increased use of technology, especially radio, TV, and mobile phones to deliver quality education in local languages;
c) Strengthening the capacities of education providers and improving their welfare; and,
d) Ensuring that our education curricula are *relevant to the socio-cultural needs of the people.*

Therein lies the challenge before us. Our work as ODL practitioners is well laid out. As it is said in the Bible, *the harvest is plenty, but labourers are few*. Let us therefore go out to bring people to the harvest.

We must continue to strengthen our capacities, especially in the use of emerging technologies to reach the yet unreached, widen and adapt existing services to fit African cultural idiosyncrasies, and design new quality standards that will measure and highlight areas/needs for improved efficiencies and effectiveness in the delivery of education to our people through ODL.

Table 5: Literacy and Out of School

Ranking of Countries by Education Literacy Rate		**Ranking of Countries by Out-of-School Rate**	
Libya	99.95	Algeria	0.35
Seychelles	99.07	Angola	
Mauritius	99.04	Benin	2.79
Djibouti	98.91	Botswana	
Equatorial Guinea	98.26	Burkina Faso	36.27
Cabo Verde	98.11	Burundi	23.7
Tunisia	98.06	Cabo Verde	6.45
Botswana	97.85	Cameroon	6.53
São Tomé & Príncipe	97.78	Central African Republic (CAR)	
Morocco	97.73	Chad	46.59
Algeria	97.43	Comoros	24.92

Ranking of Countries by Education Literacy Rate		**Ranking of Countries by Out-of-School Rate**	
Eswatini (formerly Swaziland)	95.47	Cote d'Ivoire	29.36
South Africa	95.32	Djibouti	48.85
Namibia	95.16	Egypt	6.94
Eritrea	93.27	Equatorial Guinea	55.3
Ghana	92.49	Eritrea	44.9
Zambia	92.09	Eswatini (formerly Swaziland)	12.67
Zimbabwe	90.43	Ethiopia	33.85
Gabon	89.78	Gambia	18.19
Uganda	89.4	Ghana	12.94
Burundi	88.22	Guinea	21.91
Egypt	88.19	Lesotho	13.08
Kenya	87.83	Liberia	21.36
Rwanda	86.49	Madagascar	1.96
Tanzania	85.76	Malawi	15.05
Lesotho	85.09	Mali	50.71
Cameroon	85.08	Mauritania	33.85
Congo, Democratic Republic of the (DRC)	84.99	Mauritius	8.65
Togo	84.29	Morocco	9.67
Congo, Republic of the (RC)	82.05	Mozambique	24.89
Madagascar	81.2	Namibia	1.52
Comoros	78.27	Niger	52.04
Angola	77.43	Nigeria	33.77
Guinea-Bissau	77.28	Rwanda	14.08
Nigeria	75.03	São Tomé & Príncipe	12.12
Sudan	73	Senegal	38.28
Malawi	72.94	Seychelles	5.27
Ethiopia	72.75	Sierra Leone	29.74
Mozambique	70.91	Somalia	
Senegal	69.48	South Africa	11.53
Gambia	67.16	South Sudan	62.36

Ranking of Countries by Education Literacy Rate		Ranking of Countries by Out-of-School Rate	
Sierra Leone	66.65	Sudan	38.3
Mauritania	63.95	Tanzania	39.72
Benin	60.95	Togo	21.11
Cote d'Ivoire	58.42	Tunisia	
Burkina Faso	58.29	Uganda	
Liberia	55.4	Zambia	14.9
Mali	50.13	Zimbabwe	0.35
South Sudan	47.9		
Guinea	45.24		
Niger	39.79		
Central African Republic (CAR)	38.27		

Table 6: Secondary and Tertiary Gross Enrollment Ratio in Africa

Ranking of Countries by Gross Enrolment Ratio (Secondary)		Ranking of Countries by Gross Enrolment Ratio (Tertiary)	
Angola	50.67	Algeria	51.37
Benin	59.04	Angola	9.34
Botswana	23.4	Benin	12.27
Burkina Faso	40.71	Botswana	25
Burundi	48.47	Burkina Faso	6.5
Cabo Verde	88.16	Burundi	6.05
Cameroon	60.06	Cabo Verde	23.62
Central African Republic (CAR)	17.14	Cameroon	12.76
Chad	22.56	Central African Republic (CAR)	3
Comoros	59.47	Chad	3.25
Congo, Democratic Republic of the (DRC)	46	Comoros	9
Congo, Republic of the (RC)		Congo, Democratic Republic of the (DRC)	6.6
Cote d'Ivoire	51.03	Congo, Republic of the (RC)	12.67

Ranking of Countries by Gross Enrolment Ratio (Secondary)		**Ranking of Countries by Gross Enrolment Ratio (Tertiary)**	
Djibouti	51.97	Cote d'Ivoire	9.34
Egypt	87.91	Djibouti	5
Equatorial Guinea		Egypt	35.16
Eritrea	47.7	Eritrea	3.36
Eswatini (formerly Swaziland)	82.41	Ethiopia	8
Ethiopia	34.94	Gambia	3
Ghana	64.57	Ghana	15.69
Lesotho	62.01	Guinea	11
Liberia	37.9	Kenya	11.46
Libya		Lesotho	10.2
Madagascar	36.53	Liberia	12
Malawi	40.28	Madagascar	5.35
Mali	41.03	Malawi	1
Mauritania	36.83	Mali	4.52
Mauritius	95.1	Mauritania	5
Morocco	80.23	Mauritius	40.6
Mozambique	35.41	Morocco	35.94
Namibia		Mozambique	7.31
Niger	24	Namibia	22.89
Nigeria	42	Niger	4.41
Rwanda	40.9	Nigeria	18.21
São Tomé & Príncipe	89.34	Rwanda	6.73
Senegal	43.7	São Tomé & Príncipe	13.38
Seychelles	81.45	Senegal	12.76
Sierra Leone	41.8	Seychelles	17.08
Somalia	26.5	Sierra Leone	
South Africa	104.7	Somalia	
South Sudan	11.01	South Africa	22.37
Sudan	46.62	South Sudan	
Tanzania	29.44	Sudan	16.92
Togo	61.85	Tanzania	4.01
Tunisia	92.87	Togo	14.52

Ranking of Countries by Gross Enrolment Ratio (Secondary)		**Ranking of Countries by Gross Enrolment Ratio (Tertiary)**	
Uganda		Tunisia	31.75
Zambia	19.93	Uganda	4
Zimbabwe	23.2	Zambia	4.12
		Zimbabwe	10.01

Conclusion

Distinguished Guests, Ladies and Gentlemen, I have spent the last three-quarters of an hour reflecting on a few pertinent questions related to our community of practice – open, distance and eLearning. I make bold to assert that ODeL programmes do not necessarily have to lead to the award of degrees in order to improve the knowledge base and skill acquisition in Africa. ODL can be the nourishing vehicle that can help meet with the ambitious socio-economic and education development agendas such as the ***Continental Education Strategy for Africa*** and the wider ***Agenda 2063: The Africa we want***. Without gainsaying, education will play a prominent role in the accomplishment of these goals and other international development goals that African nations have signed up to.

In the final analysis, there seems to be no end to the palpable advantages and contributions of ODeL mode to African situations in terms of socio-political and economic development and by extension national development of African countries. The foregoing shows that the functional implications and advantages of the ODeL scheme cover a broad spectrum of society to the benefit of everyone. ODeL holds special implication for the women, especially in a developing society of the countries of Africa, such as Nigeria, Tanzania, Zimbabwe, Kenya, Ghana, Uganda Mauritius and a host of other countries. Lots of market women, traders, itinerant businesswomen, women in Purdah, working women as well as women and girls resident in the sub-rural societies would benefit from this scheme.

Another implication of the address is that ODeL has gone a long way in increasing the literacy level of Africans generally and confirms the long held assertion of Okeke (1995) that education is the most effective strategy for promoting individual empowerment and the United Nations report on human development which states that in sub-saharan Africa education seems to be the only effective means of empowering citizens.

What has become clear is that the kind of education that would be required for the accomplishment of these development targets can also be deeply rooted within the practice of open, distance and digital learning. We in Africa should create more partnerships and networking among ODeL institutional providers within the continent on the one hand, and with the private telecommunications sector, and Non-Governmental Organizations (NGOs), on the other hand, to share knowledge and be able to further reduce costs.

I submit that open and distance learning offer important opportunities for the socioeconomic development of Africa in various sectors of human activities over the next few decades. Important manifestations of these are already evident across our continent and I see these often as I travel to different African countries including at OUT in the course of my current assignment.

Once again, I congratulate the Graduands, the Vice-Chancellor and indeed all members of the university community at the Open University of Tanzania, on the auspicious occasion of this 41st Convocation. I wish our graduands success, as they enter a wonderful new and dynamic world of opportunities.

Thank you for your kind attention.

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Vice-Chancellor, National Open University of Nigeria
1st Vice-President, African Council for Distance Education
November 2022

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Book Review:

Online and Distance Education for a Connected World

Edited by Linda Amrane-Cooper, David Baume, Stephen Brown, Stylianos Hatzipanagos, Philip Powell, Sarah Sherman and Alan Tait. London: University College Press, 2023, ISBN: 978-1-80008-480-3, 448pp.

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Open and distance learning is a relatively young area of research within higher education studies. Concerted investigations into the emergent field of open, distance and online learning are just emerging and there are very few publications that addresses various concerns in this field. "Online and Distance Education for a Connected World," edited by Linda Amrane-Cooper, David Baume, Stephen Brown, Stylianos Hatzipanagos, Philip Powell, Sarah Sherman, and Alan Tait, is a remarkable collection of essays that delves into the rapidly expanding realm of online and distance education. The book brings together an ensemble of esteemed scholars and practitioners, offering what appears to be a multidisciplinary perspective on the challenges, opportunities, and best practices associated with digital learning. With the rise of technology and the internet, education has transcended traditional boundaries, and this book seeks to explore the interconnectedness of the global education landscape in the digital age. More on this in a short while. The book comprise twenty main chapters organised into four sections.

The first section, which sets the scene for this handy publication consists of a preface, a chapter on the Centre for Online and Distance Education (CODE) and an extensive introduction by Stephen Brown provocatively titled: Online, Distance and Blended. It's all just education. The section provides a comprehensive overview of online and distance education's historical context and evolution. Apart from exploring the historical evolution of the University of London's external degree system, the first section also attempts to unpack

the definitional imperatives and effectiveness of the concept of distance education. Brown's chapter outlines the technological advancements that have revolutionised learning, paving the way for a connected world. He delved into the different modes of online learning, such as synchronous and asynchronous learning, and discuss their impact on learners and educators. By analyzing the growth and trends of distance education, this chapter provides a perspective for understanding the current state of the field.

The second Section of the book, which is labelled Section 1 focuses on Planning Distance Education and comprises six discrete chapters each of which addresses a key component of the operation of distance learning systems. The Student Voice by Pete Cannell and Julie Voce; Exploring digital learning by J. Simon Rofe; Marketing digital education for an inclusive society by Endrit Kromidha and Benedetta Cappellini; Supporting Employability by David Winter; Strategic models for distance education by Philip Powell, Mary Stiasny and Michael Davis; Open and Distance Learning in Nigeria: a case study by Stephen Brown and David Baume. A highlight of this collection is the exploration of pedagogical approaches in online education. The chapters in this section address the misconception that online learning is a mere replication of traditional classroom teaching. It emphasizes the importance of adopting learner-centered approaches and designing courses that cater to the unique needs of online learners. The authors delve into constructivist pedagogy, problem-based learning, and collaborative learning, showcasing how these methodologies can be effectively applied in a virtual environment.

The main issue with this section of the book is the chapter on Nigeria. At first glance, it seems surprising that Nigeria is the only country case study in the entire publication. More surprising is the fact that the chapter only made a passing mention of the National Open University of Nigeria and ignores the role of NOUN in the development of open and distance learning in Nigeria. The section on Capacity building for ODL fails to acknowledge the various training workshops and capacity development initiatives that the Federal Ministry of Education and the National Open University had delivered on open and distance learning for all dual-mode distance education institutions in Nigeria. Also missing is an indication of the activities of the Regional Training and Research Institute for Distance and Open Learning (RETRIDOL), established by NOUN in collaboration with the Commonwealth of Learning Canada and has played a significant role in expanding skills development in ODL in Nigeria and the rest of Commonwealth West Africa.

The third section of the book titled: Doing distance education, comprise ten chapters. Course design, pedagogy and staff development by David Baume and Matthew Philipott; Interactive Social learbing and fostering learning Communities by Ayona Silva-Fletcher and Christine Thuranira-Mckeever; The Icarus simulation tool: a case study by Lynsie Chew and Alan Parkinson; Digitally supported assessment by Leo Haveman , Simon Katan, Edward Anstead, Marco Gillies, Joanna Stroud and Sarah Shrman; Taking Assessment Online- systems, issues and practices: a case study by Linda Amrane-cooper, David Baume, Stylianos Hatzipanagos, Gwyneth Hughes and Alan Tait; Inclusive Practice by Shoshi Ish-Horoiwcz, Diana Maniati, Nicholas Charlton, Danielle Johnstone, Beatrice Hyams, Sarah Sherman, and Sarah Gonnet; Retention and success: approaches and tools for making a difference Gyneth Hughes and Joanne Harris; MOOCs for public health: a case study by sally parsley and Daksha Patel; Practicing open education by Darsha Patel, Sally Parsley, Pete Cannell and Leo Havemann; Buidling the online linrary by Matthew Philpott, Sandra Tury and Shoshi Ish-Horowicz

A central concern in online education is learner support and engagement. The chapters under this section delves into the challenges faced by learners in online settings and provides strategies to overcome them. The authors discuss the significance of establishing a supportive learning community, incorporating peer interactions, and offering personalised feedback to enhance the learning experience. The chapters also explore the role of tutors and mentors in fostering learner motivation and success. The notion of assessment as a crucial aspect of education, and the unique opportunities and challenges offered by the digital landscape in this regard are also examined. This section critically analyses the various assessment methods used in online learning, such as formative and summative assessments, e-portfolios, and automated grading systems. It addresses the issue of academic integrity and discusses strategies to prevent cheating in online assessments. Moreover, the authors emphasise the importance of aligning assessment with learning outcomes and promoting authentic evaluation practices. Technology plays a pivotal role in the online learning experience. The section chapters examine some of the latest technological innovations that have transformed education, such as learning management systems, adaptive learning platforms, and immersive virtual environments. It evaluates the potential of emerging technologies, such as artificial intelligence and virtual reality, to revolutionize teaching and learning in the future. Another area pf critical importance examined in this publication is the imperative of creating inclusive and diverse online learning environments. The authors highlight the significance of cultural sensitivity and accessibility in designing online courses. They discuss the challenges faced by marginalised learners and offer solutions to

bridge the digital divide. Furthermore, the chapter explores the role of open educational resources (OER) in promoting equitable access to education.

The fourth and final section of the publication titled: Researching and evaluating distance education comprise three chapters. Academic development, research and practice in online and distance education by David Baume; Monitoring and evaluating online and distance education by David Baume and Designing the future by Stephen Brown. The chapters focus on issues of research and evaluation and lays emphasis on the fact that ensuring the quality of online education is of paramount importance, and this chapter delves into the best practices and frameworks for quality assurance. The authors discuss the Quality Matters rubric and its application in evaluating online courses. They also explore the concept of continuous improvement in the context of online education and advocate for a culture of evidence-based practices to enhance the overall quality of digital learning. With the advent of online education, geographic barriers are becoming less significant. This chapter presents diverse case studies and experiences from different parts of the world. It examines the impact of cultural context and local practices on the adoption of online education in various regions. By showcasing successful global initiatives, the chapter inspires educators to embrace the global interconnectedness of education. The book concludes with an exploration of the prospects of online and distance education. The authors speculate on the potential impact of emerging technologies and changing societal needs on the evolution of education. They discuss the concept of lifelong learning and the role of online education in addressing future challenges, such as reskilling and upskilling the workforce.

"Online and Distance Education for a Connected World" appears to be an authoritative and timely collection that provides a comprehensive understanding of the evolving landscape of online education. The editors and contributors have succeeded in presenting a cohesive exploration of the challenges, opportunities, and best practices associated with digital learning. The book's multidisciplinary approach enriches the discussions, making it an invaluable resource for educators, administrators, and researchers alike.
Throughout the book, the authors emphasise the importance of learner-centeredness, inclusivity, and technological integration to enhance the quality of online education. By showcasing diverse case studies and global perspectives, the book inspires educators to embrace the interconnectedness of education in the digital age.
However, it would have been beneficial to include more in-depth country case studies and examples of successful online education initiatives to further illustrate the concepts discussed. The book could also have benefitted from

perspectives from other countries outside of the United Kingdom. All the authors of the chapters are based in or have relations with institutions, agencies and organisations in the United Kingdom, leaving out vast swathes of African, American and Asian perspectives on an important topic – online and distance education for a connected world. Nevertheless, the book remains a seminal work that illuminates the path towards a connected world of education, and it will undoubtedly become a foundational resource for practitioners and researchers in the emerging field of open, distance and online learning specifically and all those engaged in shaping the future of learning generally.

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Information for Authors

Formatting Instructions

Regular articles

All portions of the manuscript must be **double-spaced** and all pages numbered starting from the title page.

The Title should be a short phrase describing the contents of the paper. Where possible the title should not be longer than 18 words. Please do not type titles in upper case. The Title Page should include the authors' full names and affiliations, the name of the corresponding author along with phone, and e-mail information. Present addresses of authors should appear as a footnote. For joint publications, the name of the corresponding author should be indicated with an asterix to it.

The Abstract should be concise informative and completely self-explanatory. The Abstract should be between 200 and 250 words. Complete sentences, active verbs, and the third person should be used, and the abstract should be written in the past tense. Standard nomenclature should be used and abbreviations should be avoided. No literature should be cited.

Following the abstract, about 3 to 5 keywords that will provide indexing references should be provided. A list of non-standard Abbreviations should be added. In general, non-standard abbreviations should be used only when the full term is very long and used often. Each abbreviation should be spelt out and introduced in parentheses the first time it is used in the text.

The Introduction should provide a clear statement of the problem, the relevant literature on the subject, and the proposed approach or solution. It should be understandable to colleagues from a broad range of disciplines teachable and learnable by open and distance learning approach.

Materials and methods should be complete enough to allow experiments to be reproduced. However, only truly new procedures should be described in detail; previously published procedures should be cited, and important modifications of published procedures should be mentioned briefly. Subheadings should be used. Methods in general use need not be described in detail.

Results should be presented with clarity and precision. The results should be written in the past tense when describing findings in the authors' experiments. Results should be explained, but largely without referring to the literature. Discussion, speculation and detailed interpretation of data should not be included in the Results but should be put into the Discussion section.

The Discussion should interpret the findings in view of the results obtained in this and in past studies on this topic. State the conclusions in a few sentences at the end of the paper. The Results and Discussion sections can include subheadings, and when appropriate, both sections can be combined.

Implications for ODL: Authors should point out the implications of their findings for ODL in various aspects of policy, practice, administration and other areas. Implications for ODL especially in developing nations and technology starved environments may also be mentioned.

The acknowledgments of people, grants, funds, etc. should be brief.

Tables should be kept to a minimum and be designed to be as simple as possible. Tables are to be typed double-spaced throughout, including headings and footnotes. Each table should be on a separate page, numbered consecutively in Arabic numerals and supplied with a heading and a legend. Tables should be self-explanatory without reference to the text. The details of the methods used in the experiments should preferably be described in the legend instead of in the text. The same data should not be presented in both table and graph form or repeated in the text.

Figure legends should be typed in numerical order on a separate sheet. Graphics should be prepared using applications capable of generating high resolution GIF, TIFF, JPEG pasting in the Microsoft Word manuscript file. Tables should be prepared in Microsoft Word. Use Arabic numerals to designate figures and upper case letters for their parts (Figure 1). Begin each legend with a title and include sufficient description so that the figure is understandable without reading the text of the manuscript. Information given in legends should not be repeated in the text.

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Examples of in-text references: Abdallah (2000), Agbu et al. (2016), (Ofulue, 2011), (Agbebaku and Majebi, 2020), (Ogidan, 2012; Jegede, 2005 a, b;) Ofoha, 2010, 2013), (Peters et al. 1999)

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Examples of end-of-text references:

Marshall, J. (2016) Online Course Selection: using course dashboards to inform student enrollment decisions. Open Learning: The Journal of Open, Distance and elearning, 31(3), 245-259.

Ojo, O., Olakulehin, F., Olowola, R., Adeoye, F. & Salawu, I (2007) Evaluation of assessment methods as correlates of quality assurance and certification standards in ODL Institutions. Indian Journal of Open Learning, 16(3), 245-253

White lock, D., & Watt, S (2008) Putting Pedagogy in the driving seat with open comment: An Open source formative assessment feedback and guidance tool for history students. In F. Khandia (Ed.), Proceedings of the 12th CAA International Computer Assisted Assessment conference (PP.347-356). Loughborough: Professional Development, Lougborough University.

Maudlin, M.P. and K.L. Gustafson. (1997) Is Instructional Design a paradigm for Public Education. In CLR. Dills & A.J. Romiszowski (Eds.) Instructional Development Paradigms. Edu

Short Communications

Short Communications are limited to a maximum of two figures and one table. They should present a complete study that is more limited in scope than is found in full-length papers. The items of manuscript preparation listed above apply to Short Communications with the following differences:

1. Abstracts are limited to 100 words.
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3. Results and Discussion should be combined into a single section.

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- The first page of the manuscript should contain the title, author's name(s), institutional affiliation(s) and email address. Names should be written in the following order: FirstName, Initial, Surname.
- Titles and headings should start with the first letters in capitals and should not be numbered.
- Abstracts should be between 200 and 250 words, with three (3) to five(5) keywords below.
- Length of the manuscript: Research articles – 4,000 to 6,500 words.
- Review articles – 8,000 to 10,000 words.
- Technical Reports, Case Studies, and Invited Commentaries – not more than 2,500 words.
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- Footnotes are not accepted. Endnotes may be included in the article just before the reference list.
- The first occurrence of abbreviated words should be provided in full with the abbreviation following in a bracket.
- References should follow the American Psychological Association (APA) style, 7th edition.
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JOURNAL EDITORIAL POLICY
Abridged Version

1.0 FOCUS AND SCOPE

The West African Journal of Open and Flexible Learning (WAJOFEL) is a practitioner's journal of the Regional Training and Research Institute for Distance and Open Learning (RETRIDOL) published twice a year. Manuscripts may be submitted at any time for publication consideration. All manuscripts submitted are subject to the peer-review policy provided herein.

WAJOFEL accepts manuscripts in English language from all disciplines which emphasize open and distance learning (ODL), e-learning, distributed learning, asynchronous learning and those whose research results have significance for ODL in the aspects of policy development, best practices and administration. Manuscripts should meet the general criteria of academic excellence and should not have been previously published nor be under consideration for publication elsewhere.

2.0 ARTICLE TYPES

Three types of manuscripts may be submitted for consideration:

- Regular (original research) articles: These should describe new and carefully confirmed findings, with experimental procedures given in sufficient detail for others to verify the work.
- Short Communications: A Short Communication is suitable for recording the results of complete small investigations or giving details of new models or hypotheses, innovative methods, techniques or apparatus.
- Review/Opinion papers: Submissions of reviews and perspectives covering topics of current interest are welcome and encouraged.

3.0 SUBMISSION GUIDELINES

Submission of manuscripts is via email. Manuscripts should be sent to the Editorial Office at: wajofel@noun.edu.ng as an attachment.

A manuscript number will be assigned and emailed to the corresponding author within 72 hours. The manuscript should have a cover page which includes the corresponding author's full name, address and telephone number. The surname of the author should be used to name the file sent as an attachment. The attachment should be a single complete file that includes all figures and tables in Microsoft Word's .docx format. LaTeX users should convert their files to PDF file format before attaching and sending.

Contact the Managing Editor at wajofel@noun.edu.ng for the comprehensive journal editorial policy

4.0 ARTICLE PROCESSING FEE

A total article processing fee (APC) and page charge of N20,000.00 ($60.00) is charged for all manuscripts submitted for publication. This fee is payable in two instalments:

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Payment modalities will be supplied to authors whose manuscripts have been given broad clearance for review.

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All manuscripts received undergo a double-blind review process. Manuscripts are reviewed in the first instance by the members of the Editorial Board for clearance and then by two suitable subject specialist reviewers. Decisions will be made as rapidly as possible and the journal strives to return reviewers' comments to authors within the shortest possible time.

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