

## Using Learning Analytics (LA) in Developing Future Competencies by Teachers of Nwafor Orizu College of Education, Nsugbe

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### Abstract

This study, a descriptive survey research, investigated the use of learning analytics in developing future competencies of students by teachers of Nwafor Orizu College of Education, Nsugbe. Hinged on functionalism, this study provided evidence about what should be considered future competence skills among students of the College, as well as the awareness of, and use of learning analytics by teachers in the College. The study was carried out among 54 lecturers/teachers from the six Schools of the College. In line with the research questions, a researcher developed questionnaire tagged Questionnaire on Awareness of, and Use of Learning Analytics by Teachers (QAULAT) was used to generate data for this study. Data were analysed using mean and standard deviation. Findings from this research highlight the future competencies considered important for colleges of education students to acquire during their studies. Findings also provide evidence of very poor awareness and use of learning analytics by teachers in the College. From the findings, training of teachers on the use of learning analytics was recommended among others.

**Key words:** Learning analytics, competencies, future competencies

### Introduction

There is a technological revolution in different fields of knowledge, Education inclusive. This revolution in Education has informed rethinking of theories and practices. The revolutionary changes are also witnessed, not only on instructional design, delivery and assessment, but also on student advising (Fu et al. 2019). This revolution in education has created such new situations as individualised learning, determining students' behaviour with regards to their potentials for success or failure; and the use of alternative assessment tools. The use of learning analytics creates opportunities for individualised learning, so as to determine students' behaviours associated with success; examining how such behaviours have the propensity for students' success or otherwise. The analytics programmes that were once reserved for application in big businesses are now being widely used in higher education institutions across the globe to measure student growth, inform curriculum decisions, and identify students at risk for failing a course or programme.

As working-life is constantly evolving and setting new priorities for competence development, identification of relevant future competencies is needed to ensure that these desired learning outcomes are intentionally promoted in education curriculum and in teaching practice in particular. In addition, an enhanced understanding of future competencies serves as a foundation for aligning emerging technology-enhanced approaches, such as learning analytics, to boost their development. Teaching staff of Nwafor Orizu College of Education, Nsugbe seem not to be caught in the wave of the moment. This study attempts to ascertain the knowledge of, and the employability of learning analytics in their practice. While this research is of direct importance and relevance to our tertiary institutions, it also contributes to a more fundamental understanding of issues associated with learning analytics, an emerging field which is currently under-researched.

This study explored the views of teachers in Nwafor Orizu College of Education, Nsugbe in the use of learning analytics. Specifically, it determined what the future competencies that are considered important for students in Nwafor Orizu College Education students in Anambra State to acquire during their studies. It also determined the extent of awareness and use of learning analytics by teachers of the College.

### Research Significance/Impact

Student engagement is one of the most relevant topics within the academic and research community nowadays. With the call for the revitalisation of education, especially teacher education, there is the integration of new technology-supported learning solutions to enhance teacher and learner interactions and influence learner engagement positively. This research addresses the need to explore new ways of improving teaching practice to better engage students with the help of learning analytics. The evidence provided by this research highlighted the future competencies considered important for college of education students to acquire during their studies. While this research draws attention to the issues and concepts related in using learning analytics, and aside strengthening the knowledge base in this field, this study would assist educators, curriculum planners, policy makers, text book writers, and indeed, all stakeholders in education, to re-examine practices, curriculum and policies in Nigerian to equip learners better for future competencies.

### Research Questions

1. What are the future competencies considered important for students of NwaforOrizu College of Education, Nsugbe to acquire during their studies?
2. To what extent are teachers in Nwafor Orizu College of Education, Nsugbe aware of the concept of Learning Analytics?
3. To what extent do teachers in Nwafor Orizu College of Education, Nsugbe apply Learning Analytics in their practice?
4. What are the challenges of using Learning Analytics in education in Nwafor Orizu College of Education, Nsugbe?

### Conceptual Framework

In addressing the problems of this study, the following concepts would be reviewed:

#### Learning Analytics (LA)

The Society for Learning Analytics Research (“SOLAR”) defines learning analytics as “the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs” (SOLAR, 2012, p.1). It has been defined as the use of “data and any other additional observations that can be obtained... to directly impact the students, the instructors and the details of the learning process” (Romero-Zaldivar et al., 2012 p. 1059).

#### Features of Learning Analytics

Kleimola & Leppisaari (2022) have identified two primary features of learning analytics thus: a) using data management systems to effectively collect learner data in a timely fashion, and b) using analytic tools and techniques of other disciplines to interpret this data. It is a known fact that in LA, data analysis, the first step is the effective collection of data from two primary sources: student information system (SIS) used to create learner profile; and learning management systems (LMS) used to provide information about learner behaviour (Kleimola & Leppisaari 2022; Siemens, 2013). LMSs are software that house lessons, assessment, and other pertinent information about a course. Learning management systems (LMSs) have been developed in this digital age to fill the role of the traditional classroom. Where traditional, physical classrooms provide structure, location and order to student learning, LMSs provide similar scaffolding to students in an online or blended learning courses.

Compared to the data produced by traditional, in-class assessments and observations, the data captured by an LMS is diverse and rich in its content. Where an in-classroom teacher may be only able to see the total number of problems a student completed on an English assignment, for example, or which problems he omitted, an LMS can capture all the same data and provide additional information, such as the time it took the student to complete the assignment, which questions took the longest, which specific types of questions the student struggled with the most, and more (Martin & Ndoye, 2016).

Once the data is collected from these systems, the second feature of LA emerges: the analysis of the data. The analysis of the learner data can take many different forms depending on the nature of the data itself. Qualitative data is organised and classified, while quantitative data is subjected to statistical analysis. This statistical analysis can take the form of descriptive statistics to help an educator understand what has happened or, in more complex cases, take the form of inferential statistics to make predictions about future performances and behaviours. In every case, learner data is examined, analysed, and digested in such a way that meaningful trends and patterns emerge (Kleimola & Leppisaari, 2022).

#### Benefits of Learning Analytics

By leveraging the vast amounts of data available, learning analytics offers several meaningful benefits to learners, teachers, and researchers. These benefits have been identified by many researchers. Siemens, 2013; Ifentahler et al, 2014; Kleimola & Leppisaari, 2022; Castellanos et al., 2017; Abelardo et al., 2017; Strang, 2017; Reigeluth et al., 2015; Jonassen 1999; Perkins, 1991; Verbert et al., 2012; Kizilcec et al., 2017. They include: personalised learning, identifying learning gaps, enhancing student engagement, assessing course effectiveness, predictive analytics, determining students’ characteristics, meaningful feedback, and support for the teacher

#### Limitations and Criticisms of Learning Analytics

Learning analytics is not without its limitations and criticisms. The three primary limitations and criticisms of LA are: (1) data quality concerns, (2) ethical concerns about the ownership and appropriateness of the collection of large amounts of learner data, and (3) the fear of an automated educational system and its effect on student learning’ ( Ifentahler et al., 2014; Slade & Prinsloo, 2013,)

### **Learning Analytics Tools**

Learning analytics tools help to improve online learning experiences and outcomes. Examples of such tools abound on the internet. They include Google Analytics, Moodle Analytics, Watershed, Zoola Analytics, The Social Network Adapting Pedagogical Practice (SNAPP), Connect for Success (C4S), Personalised Adaptive Study Success (PASS), etc. There are many learning analytic tools. Some can be self developed or be accessed and can adapted online where necessary. It is important for teachers to choose the right tools as determined by their goals, data, and needs.

### **Competencies and future competencies**

Competency is the degree of ability to perform certain tasks. It is a combination of tacit and explicit knowledge, behaviour, and skills that enable effective task performance Anyadiegwu & Osegbo (2024). Competencies emphasise outcomes or a realised ability, they are not time-based or “gestalt in nature”; i.e., they are made up of a bunch of smaller parts and not one big whole.

Future competencies are generic, interdisciplinary competencies which have gained increased attention around the world. They have been referred to using several and interchangeable terms such as key competencies (Council of the European Union, 2018), future competencies (Marope et al., 2019), transformative competencies (OECD, 2019), twenty-first century skills (Binkley et al., 2012), generic employability skills (Curtis & McKenzie, 2002), soft skills (Robles, 2012), graduate attributes (Barrie, 2012; Hager & Holland, 2006) and generic capabilities (Bowden et al., 2000).

In this study however, the term ‘future competencies’ is adopted. It is used to refer to those generic competencies that are relevant for higher education students and which can prepare them for operating in emerging future contexts. Future competencies enable students to solve problems and act successfully in a self-organised manner in uncertain settings and various contexts (Ehlers, 2020). They are seen to entail not only the mobilisation of knowledge and skills, but also personality traits such as attitudes and values (Binkley et al., 2012; OECD, 2019; Rigby et al., 2009). Thus, future competencies are much more than just a set of general skills or pieces of knowledge. They are generic and interdisciplinary in the sense that they are acquired and supported across the boundaries of various disciplines and domains of knowledge (Barrie, 2012; OECD, 2019). This does not imply that they are necessarily independent of discipline-related knowledge, skills and dispositions but rather closely intertwined with them (Barrie, 2012; Hyttinen et al., 2019).

Future competencies are often outlined and defined by their relevance in terms of employability and subsequent success on the labour market, as noted by Rigby et al. (2009) as well as Treleaven and Voola (2008). Increasingly, the competencies relevant for the future are being perceived and described in a broad, universal sense. They are targeted to facilitate individual development not only for professional purposes but also for societal needs; future competencies are needed by active, committed members of society (Rigby et al., 2009). Many studies see these competencies as abilities such as critical thinking, problem solving, collaboration and communication, ICT literacy, creativity and learning literacy (Van Laar et al., 2017; Voogt & Roblin, 2012; Wang et al., 2019). Included also are qualities related to social and cultural awareness (Van Laar et al., 2017; Voogt & Roblin, 2012) as well as ethical awareness (Van Laar et al., 2017). It has been suggested that educational institutions should place a stronger focus on the integration of future competencies across curriculums, and to ensure sufficient space for them, as they are complex and cross-disciplinary in their nature (Voogt & Roblin, 2012).

### **Theoretical Underpinning**

This study is based on functionalism. Functionalism views education as an important social institution that contributes both manifest and latent functions. Functionalism see education as serving the needs of society by preparing students for later roles, or functions in society. Functionalists focus on the positive functions of education, creating social solidarity, teaching core values and work skills, and role allocation/meritocracy. Functionalism believe that education is a way of achieving in society, and that education system has to provide skills and expertise needed by industry and the economy. They state that certain competencies known as future competencies are required to function effectively in the society and in the work place in particular (Gomez-Diego, 2019).

### **Methodology**

The study adopted a descriptive survey approach. The population of the study consisted of all the 261 lecturers in Nwafor Orizu College of Education, Nsugbe (Personnel Unit Nwafor Orizu College of Education, Nsugbe, 2024). And through stratified random sampling, a sample of 54 lecturers/teachers was drawn from the 6 Schools of the College (9 from each School).

In line with the four research questions, a researcher developed questionnaire tagged Questionnaire on Awareness of, and Use of Learning Analytics by Teachers (QAULAT) was used to generate data for this study. The instrument was structured on four-point rating: Very High Extent (VHE) = 4 points, High Extent (HE) = 3 points, Low Extent (LE) = 2 points and Very Low Extent (VLE) = 1 point. The instrument was subjected to both face and content validity by experts in Measurement and Evaluation and Educational Technology before use. The questionnaire was also subjected to a reliability testing on SPSS 23 in order to ascertain the coefficient for a Cronbach Alpha. The coefficient gotten from the Cronbach Alpha method was 0.89, and this was considered excellent, making the instrument satisfactorily fit for the study.

The direct retrieval method of instrument for data collection was adopted for the study to ensure effective and prompt data collection. A total of 54 copies of questionnaire were distributed and retrieved.

The outputs of the 4 point Likert scale format used were presented and analysed using SSP Version 21, using mean and standard deviation. Mean cut off was 2.50. All items with the mean of 2.50 were regarded as agreement and accepted; while those less than 2.50 were regarded as disagreement and were accordingly rejected.

### Data Presentation and Discussion of Findings

Data would be presented and discussed in line with the research questions guiding this study.

**Research Question 1:** What are the future competencies considered important for students of Nwafor Orizu Colleges of Education, Nsugbe to acquire during their studies?

**Table 1**

*Future Competencies considered important for Nwafor Orizu College of Education Students to Acquire.*

SN	Variables	VHE	HE	VLE	LE	Mean	SD	Remark
1	Skills to prepare students for the future include civic literacy, global awareness and cross-cultural skills, critical thinking and creative skills communication and collaboration skills, etc.	34	18	0	2	3.56	0.66	Accepted
2	Attitudes and values which students should cultivate to be successful in the future include responsibility, resilience, integrity, dignity, truthfulness, fairness, cross-cultural tolerance, etc.	29	23	0	2	3.46	0.70	Accepted
3	Knowledge areas which students should have as a strong foundation to be successful in the future include theories, concepts, methods, techniques and strategies, civic responsibility, cultural awareness, etc.	37	12	3	2	3.56	0.74	Accepted

4	Classroom competencies for trainee teachers include formulating behavioural objectives, writing a lesson plan, using teaching skills, classroom management, use of class board, use of teaching strategies, assessment using different assessment tools, use of technological devices, etc.	44	10	0	0	3.81	0.43	<b>Accepted</b>
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*Source: Field Survey 1, 2024*

From table 1 above on the opinion of the respondents on the future competencies considered important for Nwafor Orizu College of Education Nsugbe students to acquire during their studies, all items yielded mean scores of 3.56, 3.46, 3.56, 3.81,. This signifies acceptance. All the future competencies listed in the items are accepted as being needed by students of the College.

**Research Question 2:** To what extent are teachers in Nwafor Orizu College of Education, Nsugbe aware of the concept of learning analytics?

**Table 2**  
*Responses on the Extent to which Teachers in Nwafor Orizu College of Education, Nsugbe are Aware of the Concept of Learning Analytics.*

SN	Variables	VHE	HE	VLE	LE	Mean	SD	Remarks
1	Learning analytics (LA) is a traditional approach to teaching.	18	12	14	10	<b>2.70</b>	<b>1.13</b>	<b>Accepted</b>
2	LA involves collection of teachers' data as well as the interpretation of such data.	15	23	9	7	<b>2.85</b>	<b>0.96</b>	<b>Accepted</b>
3	Google is an example of LA tool.	15	20	8	11	<b>2.72</b>	<b>1.08</b>	<b>Accepted</b>
4	LA ensures tailor-made teaching and learning.	7	12	14	21	<b>2.09</b>	<b>1.06</b>	<b>Rejected</b>

*Source: Field Survey 2, 2024*

Table 2 above shows the opinion of the respondents on the extent teachers in Nwafor Orizu College of Education, Nsugbe are aware of learning analytics (LA). They believe that LA is a traditional approach to teaching and involves collection of teacher's data and interpreting them. Furthermore, they accepted that Google is an example of LA tool. However, they are of the opinion that LA does not ensure tailor-made teaching and learning. Table 2 above shows that majority of the teachers in Nwafor Orizu College of Education, Nsugbe are not aware of the concept of Learning Analytics. Item 1 one ought to be rejected by their responses if they are aware of that LA is NOT a traditional approach to teaching; but rather an emerging technological innovation that is applied in online and blended learning. In the same vein, items 3 rejected as Google is not a learning analytic tool but a

search engine; and item 4 ought to have yielded accepted being that LA ensures tailor made (personalised and customised learning) for learner.

**Research Question 3:** To what extent do teachers in Nwafor Orizu College of Education, Nsugbe apply learning analytics in their practice?

**Table 3**

**The Extent to which Teachers in Nwafor Orizu College of Education, Nsugbe Apply Learning Analytics in their Practice.**

SN	Variables	VHE	HE	VLE	LE	Mean	SD	Remark
1	Use of data informs my teaching decisions	21	20	9	4	3.07	0.93	Accepted
2	Data I use in making teaching decisions are generated by me, the department, the College and Education policy makers	23	18	8	5	3.09	0.98	Accepted
3	I have used one or two LA tools for their class.	8	9	19	18	2.13	1.04	Rejected
4	Use of LA impacts positively on my teaching	7	7	23	17	2.07	0.99	Rejected

**Source: Field Survey 3, 2024**

Table 3 above reveals the responses of the respondents on the extent teachers in Nwafor Orizu College of Education, Nsugbe apply learning analytics (LA) in their practice. They are of the opinion that the use of data informs their teaching. Additionally, they agreed that the data they use are generated by them, the College management and policy makers. This kind of data do not reflect the comprehensive data and analysis as LA would have provided

Furthermore, they agreed that they have not used LA tools for their class. Lastly, they are also of the opinion that the use of LA does not positively impact on their teaching.

**Research Question 4:** What are the challenges of using learning analytics in education in Nwafor Orizu College of Education, Nsugbe?

**Table 4**

**The Challenges of Using Learning Analytics in Education in Nwafor Orizu College of Education, Nsugbe.**

SN	Variables	VHE	HE	VLE	LE	Mean	SD	Remark
1	Lack of knowledge of LA	23	20	6	5	3.13	0.94	Accepted
2	Lack of training and skills on LA	23	18	8	5	3.09	0.98	Accepted
3	Non availability of internet access bundle and high cost of subscription for internet bundles	26	17	6	5	3.15	0.96	Accepted
4	Poor power/electricity supply	27	17	5	5	3.22	0.96	Accepted

**Source: Field Survey 4, 2024**

From table 4 above on the opinion of the respondents on the challenges of using learning analytics in education in Nwafor Orizu College of Education Nsugbe , all items yielded mean scores of 3.13, 3.09, 3.15, 3.22, this signifies acceptance.

### Conclusion

Learning Analytics is a game-changer in the field of education, empowering educators to create personalised and compelling learning experiences. By harnessing the power of data, institutions, and educators can better understand student behaviour, address learning gaps, and continuously improve the quality of programmes and learning. As technology continues to evolve, learning analytics will undoubtedly play an increasingly crucial role in shaping the future of education and helping learners worldwide unlock their full potential.

### Recommendations

Following the findings of this research, the following recommendations are hereby made

- Urgent training and retraining of teachers in the College on Learning Management Systems,
- Training and retraining of teachers in the College on the use of some Learning Analytic tools;
- Policy formulation on the use of blended learning by teachers in the College so as to enable them integrate the use learning analytics tools for effective practice.
- Policy formulation on the use of learning analytics tools by teachers of the College for effective practice.
- Government's intervention in the provision of facilities and resources required for the application of learning analytics in the College.
- Government's intervention in the area of power supply for the application of learning analytics by staff and students.

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