Quality Teaching: A Focus for Educationists in the Fourth Industrial Revolution

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 DOI: https://doi.org/10.5281/zenodo.13740081

Abstract: This paper explored the quality of teaching as a focus for educationists in the 4th industrial revolution. Descriptive survey design was adopted for the study and simple random sampling technique was employed to select respondents across gender lines. Structured questionnaire was the data instrument used for this study. The instrument was validated by two lecturers who are measurement and evaluation specialists. Sample size of 120 respondents was drawn from the population of 680 people, comprising 70 teachers and 50 students, drawn from 2 public and private secondary schools in Enugu State. Sample size was statistically determined using Chall-Dale Readability Score. As a result of the sizeable nature of the sample size, the whole population was studied. This study was guided by two hypotheses which were analyzed using chi-square and tested at 0.05 level of significance with one degree of freedom. The findings of this study state that educationists should focus on promoting quality teaching by laying more emphasis on the use of innovative teaching approaches cum methods and technological devices characterized by 4th industrial revolution to enhance students' academic excellence. Based on these findings, the study recommends that educationists should wake up on the call to utilize these advanced technologies such as Smart devices, Robotics, Big Data, 3D printing, Internet of Things (IoT), Virtual reality (VR) and Artificial Intelligence (AI) to promote quality teaching and learning for the benefits of the teachers and students.

Keywords: Quality, quality teaching, educationists, fourth industrial revolution

Introduction

The fourth industrial revolution analyses the impact that technology has on human existence, attracting technological innovations in all spheres of life where teaching and learning, skills, and workforce depend on technology. The quest for improvements, modifications, and progressions in the educational system ushered in the compliance and adoption of technological smart devices and innovational approaches in teaching and learning which are characterized by the 4th industrial revolution (Ajah and Chigozie, 2019).

As the educational system navigates through this era of technological advancements, it has become clear that quality education is no longer a luxury but a necessity. Teachers as the guardians of knowledge and primary facilitators of learning play basic roles in preparing students for a future that is increasingly complex, uncertain, and rapidly changing. However, 4th industrial revolution demands more than just the traditional teaching methods, it mandates educators to adopt innovative approaches to foster critical thinking, adaptability, problem solving

abilities, creativity and cultivating emotional intelligence, empathy and social skills (Pacho, 2018). In this context, focusing on quality education is not only an imperative but a strategic one which will determine the future of our society as a whole (Pacho, 2018). The key aspects of quality education in 4th industrial revolution is how teachers can rise to the challenges of preparing students for a future that is increasingly uncertain, yet full of opportunities (Onyema and Deborah, 2019). Nigerian educational system, Enugu state particularly has transformational procedures which has already been set for acceptance across all levels of education, these are requirements that teachers must adopt and employ in the classrooms to enhance effective teaching and learning in this 4th industrial revolution.

The 4th industrial revolution is characterized by the rapid advancement of technology, automation, and digitalization which have not only transformed industries and economies but also the way we live, work, and learn (Ajah and Chigozie, 2019). The 4th industrial revolution is revolutionizing the way we live and interact, marking a significant shift from the digital age to an era of technological fusion. As automation, artificial intelligence, and data analytics transform society, the skills and knowledge required for success in teaching and learning are changing rapidly.

Quality centres on the knowledge, skills, and ability of the teacher to develop and employ meaningful pedagogic experiences for the students. Quality requires the ability of the teacher to possess the competencies to teach effectively. Quality could also be perceived as the degree of excellence and the extent to which a process or procedure complies with and meets the requirements and standards set for acceptance (Ezeofor et al, 2020). Through quality, productivity is enhanced, which embraces the scope of the curriculum, diverse training, teaching and learning approaches, learning resources and facilities, students' and teachers' performance evaluation, and support from both the government and school authorities (Onyema and Deborah, 2019).

Quality teachers beget quality teaching. Quality teachers could be perceived as those teachers whose experiences and qualifications reflect a deeper understanding of their skills and competencies and would effectively, integrate technology into their teaching methods (Tenuto, 2021). Their experiences enable them to design relevant and engaging lessons that incorporate technological tools and platform, to prepare students for the digital workforce and foster innovative and entrepreneurial. Certification in teaching profession is not enough to label someone a quality teacher. Quality teaching entails the implementation of effective and interactive teaching methodologies with technological devices supported by adequate training and knowledge of subject content (Ezeofor, et al, 2020).

Quality teaching in the 4th industrial revolution is centered on exposing teaching and learning to advanced teaching methodologies using technological devices with excellent teachers who has the knowledge to impact on the students' academic progress (Pacho,2018). Quality teaching encompasses teaching the students with those qualities and skills that are necessary to live in the technological advanced environments, which are characterized by the fourth revolution (Ajah and Chigozie, 2019). Quality teaching occurs when teachers are conscious of the rich content of the subject-matter and their decisions on the pedagogical knowledge and technological devices to apply in optimum learning for their students (Ezeofor, et al, 2020). Teachers are expected to embrace student-centered approaches to teaching and learning, allowing students to take ownership of their education and encouraging problem solving abilities, logical thinking and digital literacy, this is because, students' learn best when they are taught based on their own styles and abilities. Gone are the days when teachers are controllers and

repositories of knowledge. Today, the educational system is open to train and re-train their teachers to enable them embrace technological advancements in teaching and learning to enhance quality teaching.

Educationists are referred to as educators or teachers who are professionals in their abilities to impact worthwhile knowledge and skills to the students. In this 4th industrial revolution, quality teaching would only be achieved if the educationists would be open to changes in teaching and learning approaches as well as adapting instructional strategies to cater for the needs of their students (Onyema, 2019). In this industrial revolution, educationists need to go beyond traditional teaching methods and incorporate innovative technology into their classroom (Sharma, 2018). In order to meet the needs of this 4th industrial revolution, educationists should focus on developing skills such as advanced analytics, the Internet of Things, and digital security, which prepare students to thrive in an ever-evolving technological landscape.

The efficiency of quality teaching in the 4th industrial revolution encompasses the integration of technologies in the teaching methods, developing and implementing student-centred approaches to quality teaching, staying updated with advancements in educational technology and having a deeper understanding and knowledge of the subject matter. This prepares the students and helps them to overcome the challenges and embrace the opportunities and competencies of the changing and complex needs of the 4th Industrial Revolution. This is what this study intends to look at.

Statement of the Problem

Nigerian educational system, Enugu State particularly has faced tremendous challenges and hindrances which contribute to the decline in the quality of teaching and learning across all levels of education. Amid the 4th industrial revolution, the educational sector has gone through critical challenges on how to deliver quality teaching that would equip students with the skills, knowledge, and competencies required to thrive in this changing technological-driven era.

Nigerian educational system has been in shambles, where some graduates from different levels of education do not have the confidence and boldness to speak or write correct sentences in the English Language. This could be attributed to poor quality of teaching and learning which are hindrances facing the Nigerian educational system today. Nigerian educational system has faced the challenges of poor recruitment processes where inexperienced and unqualified teachers are flooded into the system to teach students across all levels of education. What will be the learning outcome of students taught by such teachers?

The problem of this study is to explore ways in which educators and policymakers could develop and implement quality teaching methods, curricula, and student-centred approaches to quality teaching to help address the complex needs of the 4th industrial revolution.

Purpose of the study

The main purpose of this study is to address how educators and policymakers could develop and implement quality teaching methods, curricula and student-centered approaches to quality teaching to help address the complex needs of the 4th industrial revolution. The specific objectives were: To

1) Investigate the barriers and challenges faced by teachers in delivering quality teaching in the context of the 4th Industrial Revolution.

2) Explore innovative and student-centered approaches to quality teaching that can address the complex need of the 4th Industrial Revolution.

Hypotheses

The following hypotheses were formulated to guide the study

 H_{o} . There is no significant difference between lack of training, resources and support as significant barriers faced by teachers in delivering Quality teaching.

 H_0 – There is no significant difference between the traditional teaching methods and curricula compared to the innovative and student-centered approaches to quality teaching.

Methodology

The researcher adopted descriptive survey research method for this study. Enugu State is where this study was carried out. Enugu State consists of 17 local government areas and also among the 774 local government areas in Nigeria. Simple random sampling technique was employed to select respondents across gender lines. Structured questionnaire was the data instrument for this study. The instrument was validated by two lecturers who are measurement and evaluation specialists. The questionnaire was in two forms, one for the students and the other for the teachers. It comprises section A and section B with five items each for the bio-data of the respondents and the substantive issues of the study, for both the teachers and students alike.

Sample size of 120 respondents were drawn from the population of 680 people, comprising 70 teachers and 50 students drawn from 2 public and private junior secondary schools in Enugu State. Sample size was statistically determined using Chall-Dale Readability Score. As a result of the sizeable nature of the sample size, the whole population was studied. The administration and collection of data was done personally by the researcher and the return rate was 100%. Hypotheses for this study were analyzed using chi-square statistical tool at 0.05 level of significance with one degree of freedom.

Result

Hypothesis One

 H_{o-} There is no significant difference between lack of training, resources and support as significant barriers faced by teachers in delivering Quality teaching.

 H_{1-} There is significant difference between lack of training, resources and support as significant barriers faced by teachers in delivering Quality teaching.

Table 1

Observed values (O)

Lack of Training and Resources	(A) 102	(B) 130	232
Quality Teaching	(C) 146	(D) 302	448
Total	248	432	680

Source: Field survey, 2024

Table 2

Expected values (E)

Lack of Training & Resources	(A) 49 x 47/ 90 = 25.6	$49 \ge 43/90 = 23.4$
Quality Teaching	(C) $41 \times 47/90 = 21.4$	41 x 43/90 = 19.6

Source: Field Survey, 2024

Table 3

Applying the values of Observed (O) and Expected Values (E) on the Table

O(Observed	E(Exposted	O F	$(\mathbf{O} \mathbf{E})^2$	$(\mathbf{O} \mathbf{E})^2 / \mathbf{E}$
O(Observed	E(Expected	$\mathbf{O} = \mathbf{E}$	$(\mathbf{O} = \mathbf{E})$	$(\mathbf{O} - \mathbf{E}) / \mathbf{E}$
Value)	Value)			
102	84.61	17.3	299.2	3.5
130	147.3	- 17.3	299.2	2.0
146	163.3	- 17.3	299.2	1.8
302	284.6	17.4	302.7	1.0

Source: Field Survey, 2024

Sum total = 8.3

Calculated X^2 value = 8.3

Summary for Hypothesis one: Calculated X^2 value = 8.3

Tabulated X^2 value = 3.84

Degree of

Level of significance = 0.05

Note: Null hypothesis is rejected if the calculated X^2 value is greater than tabulated X^2 value, Null hypothesis is accepted if the calculated X^2 value is less than tabulated X^2 value.

With the above result, the Null hypothesis one is rejected.

Decision: Therefore, alternative hypothesis which states that there is significant difference between the barriers and challenges faced by teachers in delivering Quality teaching is accepted.

Hypothesis Two

freedom (df) = 1

 H_o - There is no significant difference between the traditional teaching methods and curricula compared to the innovative and student-centered approaches to Quality teaching.

 H_1 – There is significant difference between the traditional teaching methods and curricula compared to the innovative and student-centered approaches to Quality teaching.

Table 4

Observed Values (O)

Traditional teaching	(A) 98	(B) 236	334
methods & curricula			
Innovative and	(C) 144	(D) 202	346
student-centered			
approaches			
Total	242	438	680

Source: Field Survey, 2024

Table 5

Expected Values (E)

Traditional teaching methods and	$334 \ge 242 / 680 = 118.8$	334 x 438 / 680 = 215.1
curricula		
Innovative & Student-centered	$346 \ge 242 / 680 = 123.1$	346 x 438 / 680 = 222.8
approach.		

Source: Field Survey, 2024

Table 6 Applying the Observed Values(O) and Expected Values(E) on a Table

O(Observed	E(Expected	O – E	$(O - E)^2$	$(O - E)^2 / E$
Value)	Value)			
98	118.8	- 20.8	- 432.6	3.64
236	215.1	20.9	436.8	2.03
144	123.1	20.9	436.8	3.54
202	222.8	- 20.8	432.6	1.94

Source: Field Survey, 2024

Sum total = 11.15

Calculated X^2 value =11.15

Summary for Hypothesis two: Calculated X^2 value = 11.15

Tabulated X^2 value = 3.84

freedom (df) = 1

Degree of Level of significance = 0.05

Note: Null hypothesis is rejected if the calculated X^2 value is greater than tabulated X^2 value, Null hypothesis is accepted if the calculated X^2 value is less than tabulated X^2 value.

With the above result, the Null hypothesis two is rejected.

Decision: Therefore the alternative hypothesis which states that there is significant difference between the traditional teaching methods and curricula compared to the innovative and student-centered approaches to quality teaching is accepted.

Discussion of the Findings

The tested hypothesis one indicates that there is significant difference between lack of training, resources and support as significant barriers faced by teachers in delivering Quality teaching. The result of the analysis also revealed that the calculated X^2 value is greater than tabulated X^2 value, this led to the null hypothesis being rejected and alternative hypothesis being accepted.

In this view, the researcher observes that Hypothesis one focuses on the need to expose the teachers to the numerous trainings which they needed to upgrade themselves professionally, this places them at an advantage of delivering quality teaching which improves and promotes the academic performance of their students. This could be explained in line with Onyema and Deborah (2019), they argued that through quality, productivity is enhanced, which embraces the scope of the curriculum, diverse technological trainings, teaching and learning approaches, learning resources and facilities, students' and teachers' performance evaluation and support from both the government and school authorities, to promoting quality teaching.

The tested hypothesis two states that there is significant difference between the traditional teaching methods and curricula compared to the innovative and student-centered approaches to Quality teaching. The result of the analysis also revealed that the calculated X^2 value is greater than tabulated X^2 value, this led to the null hypothesis being rejected and the alternative hypothesis being accepted. In this view, the researcher observes that traditional methods of teaching and learning has become obsolete and boring to the point that students pay little attention in the classroom, which affects their academic performance. This could be explained in line with Sharma (2018) who pointed out that, in this industrial revolution, educationists need to go beyond traditional teaching methods and incorporate innovative technology into their classroom activities (Sharma, 2018).

Conclusion and Recommendations

The 4th industrial revolution demands a radical shift in how the educators approach education, emphasizing on quality teaching which prepares students for the rapidly changing society. In order to ensure quality teaching in the context of the fourth industrial revolution, educationists need to adapt to their teaching methods and curriculum to reflect the changing needs of the digital age, on this note, they need to embrace new technologies and incorporate them into the classroom to enhance teaching and learning experiences. This study highlighted the need for innovative, student-centred approaches that develop essential skills like creativity, critical thinking, and digital literacy. Quality teaching is a contributory factor and a yardstick through which the best educational system could be achieved, where the students are well-equipped and allowed to utilize technology-based learning.

Based on the findings of this study, these recommendations were made:

1. Educationists should develop and implement innovative, student-centred curricula which promote the 4th industrial revolution.

2. The government and institutions concerned should invest in infrastructure and resources to support the integration of emerging technologies in education in this 4th industrial revolution.

3. The Educationists should develop flexible and adaptable educational systems that could respond to the everchanging needs of the 4th industrial revolution.

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