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CRITICO-CREATIVE PEDAGOGY AND ARTIFICIAL INTELLIGENCE IN THE TWENTY-FIRST CENTURY: IMPERATIVE FOR A PARADIGM SHIFT IN TEACHING

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Abstract

The twenty first century is characteristically an age of critical consciousness and creative mindedness. Preceding ages have featured either an absence of both criticality and creativity, or absence of one of the two variables. This present century, however, showcases in an unprecedented manner, a combination of critical spirit with creative spirit (critico-creative spirit). Natives of this generation have therefore, either by nature or nurture, become wired to consider reality from both critical and creative mindsets. Such mindsets, have interestingly, precipitated noble inventions and creativities in all nooks and crannies of life. Artificial intelligence, robotic engineering and virtual realities are some of the products of the minds of the century. Unfortunately, these critical and creative agents which have initiated creativities such as artificial intelligence, are gradually becoming docile through the products created. AI, for instance, is gradually carting away criticality and creativity from today's child by helping him carry out tasks and activities which had hitherto required the tasking of his God-given powers. Machines now think for humans; machines write their thesis, perfect their speeches, etc. The resultant effect of this trend is cataclysmic and the implication of these scenario to teaching profession is highly consequential. For the teacher to align himself, the curriculum, the class environment and most importantly, the learner, with the spirit and the peculiar challenges of the generation, he has to adopt a pedagogical approach which is critico-creative, and which would naturally produce a critico-creative learner who would continue to initiate critico-creativities in the midst of challenges from AI and related innovations. The paper adopted two philosophical methods of inquiry - conceptual analysis so as to analyse and clarify the various concepts employed in the work; and philosophical speculation, to adumbrate the possible changes a new approach to pedagogy would bring to Nigerian education. Sequel to arguments, back and forth, the researcher concluded that this generation needs a paradigm shift from the previous approaches, to teaching which reflects the critico-creative spirit of the century. It was recommended that pedagogues should simply embrace the approach which captures the spirit of the moment.

Keywords: Artificial intelligence, Critico-creative learners, Critico-creative pedagogy, Critico-creative spirit, Twenty-first century

Introduction

The age and circumstances surrounding learners have always determined the teaching approaches and methods adopted by teachers, as custodians of societal cultures. At the ancient times, when age was synonymous with wisdom, and life was at its ebbing stage, teachers adopted some traditional pedagogies wherein regurgitation of lessons was fashionable. "Do-as-i-say" was majorly adopted at the medieval epoch, and the modern era was of course identifiable with its pedagogy given its peculiarities and idiosyncrasies. The present age, is unarguably, a distinctly volatile but advanced age

with its characteristic ground-breaking inventions, creations and sophistications in all walks of life. Akinsanya (2022) pictures the present age as a generation which is witnessing, in an unprecedented manner, amazing discoveries in astronautics, robotics, artificial intelligence, virtual experience, and other creativities in cybersecurity, human engineering, 3D printing, 5G technology, nuclear and biochemical weaponry, animations. Creativities such as machine learning, augmented realities, smart phones, digital and media literacy, blockchain technology and crypto currencies, nanotechnology, wearable technology, social media, reusable rockets, personal assistants like Siri, Alexa, mRNA vaccines, hyperloop, bio degradable plastics, biometric authentication, graphene, hydrogen fuel cells, smart glasses, vertical farming, artificial organs, DNA ancestry kits, synthetic meat, renewable energy advancements, GPS navigation and autonomous vehicles, quantum computing, streaming services, capsule endoscopy, birth control patch, CRISPR-Cas gene editing, inter alia, are some of the products of the minds of the century. The picture created by Akinsanya above is eminently confirmed in the works of Florida, *The rise of creative class*, 2003; Cariglioli and Harris's *Accelerated learning through visible thinking*, 2000; Lipman's *Thinking in education*, 2007; Aleinikov's *Creative pedagogy*, 2013; and a host of other recent works.

Alongside creativity, the level of critical reasoning of this age is also unprecedented. The residues of criticality, precipitated by the efforts of 20th century critical theorists in the Frankfurt School, has blossomed significantly in the 21st century. Lukas, Reich, Gramsci, Habermas, Horkheimer and Adorno, all in Germany; Freire in Brazil; Illich in Austria and other progenitors of critical theory have thus reincarnated with works which challenges all forms of domination, oppression, suppression, subordination and subjugation via theories and praxis which tend to reinforce the social-political divide of the bourgeois and proletariat, oppressed and oppressor, ruled and ruler, master and slave. Examples of such works are Avil's *The future of jobs and skills*, 2020; Boykoff-Baron & Stenberg's *Teaching thinking skills*; Ennis's *A taxonomy of critical thinking dispositions and abilities*, 1987; Siegel's *Educating reason: Rationality, critical thinking and education*, 1988; Naiditch's *Critical pedagogy and teaching for social action*, 2010; Bailin & Siegel's *Critical thinking*, 2003; Akinsanya & Ojotule, *Freire's critical pedagogy and professional teaching in the 21st century*, 2022; Akinsanya & Osiyemi's *Rethinking teacher education towards producing critical and creative-minded educators in Nigeria*, 2019; just to mention but a few. To thus pontificate that the 21st century is an era of both criticality and creativity is to render a statement of fact. Hence, the present age can be labelled critico-creative, while humans living in the century are tagged critico-creative agents.

However, these critico-creative agents, who have initiated creativities such as artificial intelligence, are fast becoming docile through the products they created. Artificial Intelligence (AI), for instance, is gradually carting away criticality and creativity from today's child by helping him carry out tasks and activities which had hitherto required the tasking of his God-given powers. Machines are now thinking for humans, as they now submit AI-generated theses; they perfect their speeches through ChatGPT, and all other things which had earlier required brainstorming are now easily done with instructions to machines. The resultant effect of this trend is cataclysmic, and the implication of these scenario to teaching profession is highly consequential. For the teacher to align himself, the curriculum, the class environment and most importantly, the learner, with the spirit and the peculiar challenges of century, he has to adopt a pedagogical approach which is both critical and creative - critico-creative, and which would naturally produce a critico-creative learner who would continue to initiate critico-creativities even in the midst of challenges posed by AI and related innovations.

Statement of Problem

The critical and creative nature of humans in the present age has precipitated critical engagements in all facets of life, and has equally engineered creative engagements such as blockchain technology and crypto currencies, nanotechnology, wearable technology, bio degradable plastics, biometric authentication, CRISPR-Cas gene editing, among others. This explains the *raison d'être* for tagging the age a critico-creative century and the humans living at the age - critico-creative agents. The products of their critico-creativities are however instigating situations which would naturally suffocate the critical and creative powers in the agents, returning them to previous generations. Men no longer think as they now rely on machines to think for them. The implication of this is grievous, and if the trend is not arrested, machines may take over the universe and humans become subjected to its whims and caprices. To arrest this ugly situation, and retain humans as critico-creative agents, in the midst of challenges posed by the products of its operations, some variables have to change - approach to pedagogy must change; the pedagogue must change; the learning agent must change; the learning environment must change and the curriculum must change.

Objectives of the Study

The main objective of this study is to examine the possibility of creating a new approach to teaching which enables today's learners to cope with the challenges engineered by critical and creative engagements of humans of the present age. As such, the study shall:

- 1) establish the nexus between the spirit of an age with adopted approach to teaching and learning of the age justify the need for a new approach to teaching given the circumstances of the 21st century evolve a new approach to teaching

Significance of the Study

This work contributes to existing body of knowledge in approaches to teaching and learning - pedagogy. It is the birth of a new pedagogy- critico-creative pedagogy, precipitated by the combination of two unique approaches to teaching, synchronized so as to make the 21st century learner adapt to the challenges posed by the products of the spirit of the age.

Research Methodology

This research work adopted philosophical methods of inquiry - conceptual analysis and philosophical speculation. Conceptual analysis was used to analyse and clarify the various concepts employed in the work, such as critico-creative pedagogy; while philosophical speculation was adopted to adumbrate the possible changes that critico-creative pedagogy would bring in Nigerian education.

Pedagogy: A Conceptualization

Pedagogy is a term which has its origin in French – *pedagogie*; and in Greek – *paidagogos*, which is a combination of *paidos* (child) and *agogos* (leader). It is a relationship involving the child as a learner, and the leader of the child who is technically referred to as the teacher. Pedagogy, as a relationship, thus connotes the art of teaching and the science of teaching; in other words, pedagogy means the art and science of leading the child through learning. Basically, pedagogy considers how teachers carry out the task of teaching, in theory and practice. Related terms to pedagogy are *andragogy* and *heutagogy*. While pedagogy focusses on the approach to handling the teaching of children or dependent personalities, *andragogy* considers the teaching approach for adults or self-directed learners. *Andragogy* is basically the art and science of teaching adults, or helping adults in their learning. If pedagogy is coined from *paidos* and *agogos*, meaning leader of the child, then *andragogy* is coined from *andr* and *agogos*, meaning leader of men/adults. It generally refers to approaches and

principles used in adult education. There is however a teaching or learning approach that does not require a leader leading a child, or a leader leading an adult – it is called – heutagogy. Heutagogy does not need any leader leading a child or an adult; it is a self-determined type of learning – a self-centered instructional strategy which emphasizes dependence and autonomy. It is management of learning for independent or self-managed learners. As different as andragogy and heutagogy seem to appear, pedagogy is technically deployed as the umbrella concept for all teaching and learning activities, and so, in this paper, we shall generously take pedagogy as a term representing other associated terms with teaching.

Interestingly, teachers' actions, judgments and teaching methods are shaped by their choice of pedagogical approach which vary according to circumstances and tasks at hand. Approaches to pedagogy offer a template through which teaching and learning processes work, influencing instructional strategies and educational outcomes. Over time, different approaches have evolved which are based on various philosophical and psychological theories, each offering insights into the dynamics between teachers, students, curriculum and learning environment. The common approaches are Constructivist approach, Collaborative approach, Reflective approach, Integrative approach, Inquiry-based approach, Critical approach and Creative approach, etc. May it be quickly mentioned here that teaching approaches are not synonymous with teaching methods as some tend to confuse the terms. While the former is an umbrella, the latter is housed under the umbrella. In the next section of this paper, attention shall be focused on explaining some of the popular approaches to pedagogy and the teaching methods which emanate from the adoption of one approach or the other.

Pedagogy and Epochal Responses

Ancient Times & Pedagogical Approaches

At the ancient times, education was largely informal. For instance, in ancient Greece, pedagogy was seen as a key part of societal development. Philosophers such as Socrates emphasized the importance of questioning as a learning method. His socratic method, otherwise known as dialectics, was based on dialogue and inquiry, focusing on stimulating deep thinking in learners. This laid the foundation for constructivist approach in later years, which focuses on learners constructing knowledge through interaction. Constructivism is largely influenced by the work of Jean Piaget - 1972 and Lev Vygotsky - 1978. Constructivism asserts that learners construct knowledge through their experiences and interactions with the world, rather than simply receiving information passively. Vygotsky expanded on this with his theory of social constructivism, emphasizing the role of social interaction and language in cognitive development. For Vygotsky, learning is a collaborative process, where students build understanding through dialogue and shared experiences. Under this approach, we have the following methods of teaching - question-and-answer method, field-trip method, demonstration method, etc.

Plato via his work - The Republic advocated for an educational system that served the needs of the state and emphasized moral education. Plato's notion of education was deeply intertwined with the idea of creating virtuous citizens. In Nicomachean Ethics, Aristotle introduces the concept phronesis which involve empirical observation and knowledge derived from experience which has helped to influence later pedagogical approaches that place much emphasis on observation and practical learning. In ancient China, Confucius emphasized moral education and personal development as central to pedagogy. His teachings focused on respect for authority, tradition, and learning as a lifelong pursuit. Confucian pedagogy also underscored the teacher-student relationship, with the teacher as a moral guide and the student as a disciple seeking wisdom.

Medieval/Renaissance & Pedagogical Approaches

During the Middle Ages, education in Europe was primarily the domain of the Church. Monasteries and cathedral schools were centres of learning, where the focus was on religious and classical education. Pedagogical practices of this era involved rote learning and memorization, particularly of religious texts such as the bible. The renaissance brought a renewed interest in classical education and a humanistic approach to pedagogy. Thinkers such as Erasmus and Vittorino da Feltre promoted a more holistic education that included physical education, arts, and sciences. They believed in cultivating well-rounded individuals rather than focusing solely on religious instruction. Erasmus's ideas on liberal education stressed the development of intellectual and moral virtues, which were influential in shaping modern pedagogy.

Modern Age & Pedagogical Approaches

The modern age introduced revolutionary ideas in education, emphasizing reason, individualism, and the potential for human progress. John Locke and Jean-Jacques Rousseau were key figures whose pedagogical ideas had a lasting influence. John Locke argued that the mind was a "blank slate" and that knowledge was acquired through experience. His educational theories, as expressed in *Some Thoughts Concerning Education* - 1693, emphasized practical learning and the development of reason over rote memorization. Locke's ideas are seen as a precursor to modern theories of constructivism, where learning is seen as an active process shaped by experience. Jean-Jacques Rousseau's *Emile* revolutionized pedagogical thought by emphasizing on child-centred education. Rousseau believed that education should be natural and responsive to the needs of the child, advocating for experiential learning rather than formal instruction. His work laid the groundwork for progressivism, which became popular in the modern times. Rousseau's focus on the importance of childhood as a distinct phase of development influenced later educational theorists like Heinrich Pestalozzi, Friedrich Froebel and Maria Montessori.

The 19th century saw the expansion of public education, driven by the needs of industrializing societies. Mass education systems were established in many countries, and pedagogy became increasingly focused on creating efficient, standardized methods of instruction to meet the needs of growing populations. During this century, Pestalozzi and Froebel were key pedagogical reformers. Pestalozzi emphasized the importance of nurturing children's natural abilities through a caring and supportive environment. His method combined hands-on activities with intellectual development, emphasizing learning through experience rather than rigid instruction. Froebel, a student of Pestalozzi, is best known for developing the concept of the kindergarten. In his book *The Education of Man* - 1885, He believed that young children learn best through play and that education should foster creativity, imagination, and social skills. Froebel's kindergarten model laid the foundation for early childhood education practices still in use today.

Early part of 20th century was marked by a shift towards progressive education, largely influenced by thinkers like John Dewey. Dewey (1916) argued that education should be student-centred and based on real-world experiences. His philosophy, known as pragmatism, held that learning is a social process, and education should promote democratic participation and critical thinking. Dewey's ideas were highly influential in shaping modern pedagogical practices, particularly in the United States. In Europe, Maria Montessori developed a pedagogical approach that emphasized self-directed learning, where the teacher acts as a facilitator rather than a director. Montessori's methods focused on the child's independence and the importance of a prepared environment for learning. Her ideas

were revolutionary in early childhood education, and Montessori schools continue to thrive worldwide.

Contemporary Times & Pedagogical Approaches

Education is constantly evolving in response to societal needs, technological advancements, and an expanding understanding of how students learn best. These modern practices aim to create more engaging and effective learning environments, where students not only acquire knowledge but also develop critical thinking, problem-solving, and interpersonal skills. In this context, contemporary pedagogical practices have gained prominence, reshaping the educational experience by fostering deeper engagement and promoting the development of contemporary world. Some of the approaches to pedagogy at the contemporary time are:

Active Learning: Active learning is a pedagogical approach that emphasizes students' participation in the learning process. Rather than passively absorbing information from lectures, students engage in activities that require them to discuss, reflect, and apply knowledge. Techniques such as discussions, problem-solving exercises, and interactive activities promote deeper learning and improve critical thinking skills.

Collaborative Learning: Collaborative learning is based on the principle that students learn more effectively when they work together. This method involves students forming groups to work on tasks, share ideas, and solve problems collectively. The emphasis is on peer-to-peer interaction, where students not only learn from the instructor but also from each other (Johnson & Johnson, 2009). Collaborative learning enhances social interaction skills, encourages teamwork, and helps students appreciate diverse perspectives.

Problem-Based Learning (PBL): Problem-Based Learning (PBL) is a student-centred approach where learners are presented with real-world problems and are tasked with finding solutions. Instead of being passive recipients of knowledge, students in problem-based learning environments are active problem solvers who collaborate, research, and apply knowledge to practical situations. Problem-based learning enhances deeper understanding in that it necessitates students to become more actively involved with the course material and to apply knowledge in meaningful contexts.

Flipped Classroom: The flipped classroom model transforms the traditional teaching approach by shifting content delivery outside of class and focusing class time on interactive learning. In this model, students engage with lectures, readings, or videos at home, while class hours are dedicated to discussions, problem-solving, and collaborative work. The flipped classroom has been found to improve student engagement, enhance comprehension, and encourage more active learning during class, as students come prepared to participate in hands-on activities.

Technological approach: The integration of technology in pedagogy has significantly transformed the educational landscape. Digital tools such as learning management systems, online resources, educational apps, and virtual classrooms allow for more flexible and personalized learning experiences. The use of technology facilitates differentiated instruction, enhances accessibility, and fosters student engagement by allowing learners to explore content in varied formats.

Twenty-First Century & Pedagogical Approaches

The 21st century is actually a contemporary age, but it seems to have some peculiar trends which are typically different from other centuries in the contemporary age. The level of development of this century via creativities and critical engagements, would inevitably make anyone decipher that the present century is entirely different from other centuries even in the contemporary times. In this

age, there are two predominant approaches to pedagogy – Critical pedagogy and Creative pedagogy. The two pedagogies arose due to the nature and challenges of the 21st century. As earlier pointed out by Akinsanya & Ojotule (2022), the 21st century, with its characteristic elements, tilting more towards criticality and creativity, is consequentially in need of nothing but critical and creative pedagogies.

Critical pedagogical approach

The pioneering figure of critical pedagogy is Paulo Freire with his golden book – Pedagogy of the oppressed published in 1970. Other scholars who orchestrated critical pedagogy after Freire are Ivan Illich, Matthew Lipman, Robert Fisher, De A'Echevarra, Mike Fleetham, Henry Giroux, Iran Shor, Peter McLaren, Michale Apple, Wolfgang Klafki, Paul Richard, inter alia. Freire vehemently condemned the previous approaches to teaching, from the ancient times down to the twentieth century. He labelled the approaches as traditional pedagogy with its banking style/model of education.

As a replacement, Freire (1970) proposed a problem-posing approach, which is a method of teaching in which emphasis on critical consciousness engages learning community in dialogue and reflective inquiry in order to infuse critical powers for the purpose of human liberation and humanization. Problem posing is an active learning strategy where a teacher or student poses a problem and the class collaborates to find answers. Aimed at activate critical mindedness, this alternative education model resists transfer of knowledge and insists on empowering learners by involving them (not as objects or observers) in knowledge creation which is engendered by dialogue, interaction, and critical questioning of what is taught and its application to real life. Specifically, dialogue is crucial to problem-posing education.

Freire considered dialogue as the encounter among men, mediated by the world, in order to name the world. Dialogue is consequently an existential necessity, and since dialogue is the encounter in which the united reflection and action of the dialoguers are addressed to the world which is to be transformed and humanized, this dialogue cannot be reduced to the act of one person's "depositing" ideas in another, nor can it become a simple exchange of ideas to be "consumed" by the discussants. Education, Freire argued, is a collective, communal and social act and cognitive engagement among dialoguers. It therefore becomes a contradiction for one to begin to prescribe, transfer and deposit knowledge to learners as a consumable commodity as it is often the case of a typical conventional teacher. Dialogue, as it is referred to here, is a kind that is meaningful and intelligible. For this reason, Freire (1973) contended that true dialogue cannot exist unless the dialoguers engage in critical thinking – thinking which perceives reality as a process, as transformation, rather than as a static entity – thinking which does not separate itself from action, but constantly immerses itself in temporality without fear of the risks involved. Through critical dialogue, problem solving creates among learners, the perpetual habit of looking at problems critically since the outcome of this meaningful dialogue is generation of critical consciousness.

Creative pedagogical approach

Alongside above pedagogy, is another approach namely – creative. This approach was initiated by Dr Andrei Aleinikov, who was nicknamed mega-creativity man and the most creative man in the world. He was a science pioneer, trail-blazing award-winning educator, bestselling author with a Guinness world record. Other scholars who came after him, to spread the creative approach to pedagogy were: Edward de Bono, I.P. Ivanov, V.V. Popov, B. Zlotin, A. Zusman, R. Florida, etc. Creative pedagogy is a branch of pedagogy that emphasizes the leading role of creativity for

successful learning. It is about teaching and learning creatively, and becoming creators and creators of future (Aleinikov, 1989). Aleinikov's creative pedagogy emphasizes the importance of creativity and active student's engagement in the learning process. It aims to foster creative thinking, problem-solving skills, and innovative thinking among students. Aleinikov argues that creativity is not just a desirable trait, but a necessary one for success in the 21st century. He joins other actors to label preceding teaching approaches as traditional, as he opines that this system only focuses on memorization and regurgitation of facts, and does not prepare students for the challenges of the contemporary world. Aleinikov's pedagogy is based on the following creeds:

Creativity is a skill that can be learned. Just like any other skill, creativity can be developed through practice and training.

Creativity is essential for success in the 21st century. The world is changing rapidly, and the ability to think creatively is essential for adapting to change.

Critico-creative pedagogy: A Combined Approach

As wonderful as above two pedagogies are, their initiators and adherents treated them as different pedagogies with different mission statements, generating different results. While critical pedagogy would produce critical learners with critical consciousness, creative pedagogy brings to live creative learners with creative consciousness. The 21st century presents us with both critical and creative spirits, and neither of critical pedagogy nor creative pedagogy would be able to handle the two spirits unilaterally. This fact had been demonstrated in previous works – Akinsanya (2022), Critical thinking, creative thinking and learning-for-creativity in today's classroom and Akinsanya & Ojotule (2022) Freiere's critical pedagogy and professional teaching in the twenty-first century. These previous works exposed the distinguishing features of both pedagogies and their products - consciousness. But in the former work, however, the researcher went ahead to demonstrate the complementarity and comprehensivity of creative consciousness and critical consciousness, meaning that critical and creative consciousness are two sides of the same coin.

Creativity is critical and criticality is creative; there are elements of creativity in critical thoughts, while there are doses of criticality in creative thoughts. Take for instance, in research, the researcher begins with Criticality (CT) by pondering on the problem at hand, and later hypothesizing on possible ways to solving the problem. Once they get to this stage, they switch on the Creativity (CrT) mode which helps to create several possible solutions to the problem at hand. As soon as they can gather sufficient alternatives, they come back to the initial mode, CT, which enables them to weigh and assess the most viable solution, out of several possibilities engineered by CrT, to tackling the said problem. In this instance, the researcher has benefitted from the combined use of the two forms of thinking. This would mean that none of the two can stand independently, and that is the reason for considering the two forms of thinking as two sides of the same coin (Akinsanya, 2022:109).

The relationship demonstrated above between critical consciousness and creative consciousness is the exact relationship between critical pedagogy and creative pedagogy. This is why one can conveniently, albeit logically, pontificate that the two pedagogies can be brought together and combined into one, and this combination will thus yield a new label - critico-creative pedagogy, simply being the use of critical and creative pedagogies in producing critical and creative learners who can respond to the critical and creative needs of the present age. A pedagogy thus becomes critico-creative when the following happens -

- 1) The pedagogue is critical and creative: The new pedagogy is majorly woven around the pedagogue. Like the National Policy on Education (2013) had pontificated, the quality and

nature of any system of education is determined by the quality of the teaching personnel. This means that the teacher could make or mar any structure or innovation put in place, if the teacher-factor is not well handled. It will therefore logically follow that to adopt a critico-creative pedagogy in the school system, the teacher has to receive a training or re-training programme which makes him/her become critical and creative. Through such training/re-training, the teacher naturally becomes a critical and creative agent which would make him/her begin to teach critically and creatively even as he/she teaches criticality and creativity, creating a critical and creative teaching environment, engaging critical and creative teaching methods, engineered by critical and creative curricula which reflects subjects and topics that inculcate critical skills and creative skills, which eventually instigates critical consciousness and creative consciousness, and thus causing the emergence of critical and creative students who on the long-run would continue the process of delivering innovations and creativities. In other words, to sufficiently handle the innovations of the present age, today's learner must have the capacity to continue to engage in critico-creativities, by being taught by critico-creative pedagogues who having been trained via critico-creative curriculum and programme, are endowed with handling critico-creative pedagogical methods, and thus transfer critico-creative skills in a critico-creative class environment. Such pedagogues are to be technically called critico-creative moderators/facilitators, for their task is to moderate/facilitate critical and creative activities in the classroom.

- 2) Pedagogical methods are critical and creative: Through moderated-dialogue or facilitated-dialogue, the critico-creative pedagogue teaches learning experiences through methods that initiate creativity and criticality in every learner. Through these methods, the learner is made to ask questions, solve problems, make connections and meaning dialogically. Infact, the learner and moderator are engaged in the process of learning and teaching, as learning becomes teaching while teaching becomes learning. The concepts of collectivity and cooperation are key in this approach. This concept runs in diametrical opposition to what Freire (1970) had called "banking concept of education" which is the *modus operandi* of traditional pedagogical approach to teaching. This banking concept leaves every activity in the hand of the pedagogue, making him appear as an encyclopedia while the learner is a *tabula rasa* waiting to garner knowledge from the all-knowing encyclopedia. In the place of banking education, methods which engages the teacher and learner as stakeholders and partners in the classroom should be adopted. Such methods developed by Edward de Bono – thinking hats, cognitive research trust could be used; other methods are mind maps, mapwise, jigsaw cooperative classroom, tasc wheel, kagan structures, thinking through schools, mantle of the expert, cognitive acceleration through science education, logovisual thinking, dialectics, inter alia.
- 3) The curriculum must feature subjects and topics that reflect criticality and creativity: The curriculum, as indicated in a previous work – (Akinsanya, 2022), must have a critical and creative outlook. Every curriculum, from the early childhood level to the tertiary tier, must feature subjects which by nature and design can infuse critical and creative skills into the learner. Such subjects range from Logic/Critical reasoning, Aesthetics, Further mathematics, Coding & programming, Brainstorming, etc. Besides, topics in all subjects in the curriculum

should be couched in a such a way that they would naturally inculcate creative and critical skills in every learner.

- 4) The classroom environment must reflect criticality and creativity: The classroom environment, created by a critico-creative pedagogue, otherwise known as class moderator/facilitator, occupied by critico-creative learners, engaged through critico-creative pedagogical methods, with critico-creative curriculum which features critico-creative subjects and topics, automatically becomes a critico-creative class. Such critico-creative class must feature components such as opportunities for play and experimentation/exploration; choices to learners in terms of resources and methods; non-threatening atmosphere where learners are secured to take risks and make mistakes; activities are presented in exciting and unusual contexts; opportunities for generative thoughts where ideas are greeted openly; opportunities for critical reflections in a supportive environment; learners having a sense of engagement and ownership of ideas and tasks; respect for and value for each learner's efforts (Harrington, 2001).

Critico-creative Pedagogy, Artificial Intelligence and Paradigm Shifting

Massachusetts Institute of Technology (MIT) recently ran the first brain-scan study on people using ChatGPT, and the results are quite revealing.

They found out:

- 1) that people who relied on AI to write essays could not remember what they wrote, literally minutes after submitting. Over 80% of them failed to recall even a single sentence. In contrast, those who wrote without AI remembered their content very well. This suggests that relying on AI tools may hinder memory formation and retention.
- 2) Brain scans also revealed a nearly 50% drop in mental engagement when using ChatGPT; that mental drop persisted even after the AI was taken away. This is not just reliance; it is like the brain forgets how to engage the way a muscle weakens when it is not being used.
- 3) Even the essays themselves, though well-written, were described as "soul-less" and lacking insights - they were technically sound but emotionally flat; efficient, yet empty. These observations suggest that there is something deeper going on - Yes, AI could speed up tasks, but it eventually reduces the mental efforts required to think, wrestle, and learn.
- 4) AI can be a useful tool when used judiciously, but not as a replacement for human creativity. It is essential to strike a balance between leveraging on AI assistance and engaging our own brains.



Source: geeksaroundglobe.com

Above diagram says so much. It indicates that with AI, there is already a prevalence of reduced brain activity; impaired memory recall; cognitive debt which could precipitate long-term problems such as diminished critical thinking and creative skills and eventual memory loss; neural effects with implications for learning and memory capacities. To address and arrest this situation, a whole lot of things have to change. Interestingly, all the variables which must change are woven around pedagogy – these are: how the child learns, what he learns, where he learns and who teaches him, with what particular method. In all these, the approach to pedagogy in this age must shift.

Conclusion

From the foregoing, it is expedient to conclude that this generation needs a paradigm shift from the previous approaches to teaching, and this approach should simply reflect the critical and creative spirit of the generation, such that learners in the age would have what it takes to cope and thrive conveniently. This simply explains the adoption of a fusion of critical pedagogy and creative pedagogy into a complimentary pedagogy, simply – critico-creative pedagogy.

Recommendations

The researcher thus recommends that:

Pedagogues must jettison previous approaches to teaching and begin to adopt the approach which captures the spirit of the moment, and that is, critico-creative pedagogy.

AI should not be taken as a replacement for human creativity. We must secure a balance between relying on AI for assistance and being critical and creative via the use of the brains.

The use of critico-creative pedagogy will automatically prevent the abandonment of our brain-powers to products of our brain, and ipso facto, ensure the continual engagement of the brains for continued criticality and creativity. Hence, government and all stakeholders in education, must enforce critico-creative pedagogy is the approach adopted in schools. They must ensure that the classrooms are made critico-creative, and curricula are critico-creative friendly, and the products of the system are critico-creative compliant.

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