

Leveraging Creativity in Science Education: Inclusive Special Education's Pathway to Self-Sufficiency among Basic School Learners in Nigeria

AYUA, Geoffrey Aondolumun¹

ayuageoffrey@gmail.com

+2348069337213

OJOKO, Augusta Ndidi²

danausta817@gmail.com

+2348104617993

TERHEMBA, Wisdom Kwaghfan¹

kwatexwisdom@gmail.com

+2347063631099

EMMA-IWUOZO, Ogechukwu Uzoamaka¹

ogeemmaiwuozo@gmail.com

+2348064823687,

OKANCHE, Samuel¹

sokanche-pg26@bsum.edu.ng

+2349164825455

OBIABO, Isaac Otache¹

obiaboisaac@gmail.com

+2348163746181

¹Science Education Department, Rev. Fr. Moses Orshio Adasu University, Makurdi, Benue State, Nigeria.

²Department of Integrated Science, Faculty of Science, Federal University of Education, Kontagora, Niger State, Nigeria

Abstract

In Nigerian basic schools, inclusive special education often fails to promote learners' self-sufficiency due to the dominance of non-interactive, outdated teaching methods that limit skill development and foster dependence, especially among learners with disabilities. This paper argues that integrating creativity into science education offers a transformative alternative. Through hands-on, inquiry-based activities, creative science instruction enhances critical thinking, problem-solving, and independence, equipping learners with special needs with the confidence and competencies needed for self-reliance. The study examines the challenges hindering effective implementation of inclusive special education in Nigeria, outlines strategic pathways for embedding creativity in science teaching, and discusses the educational implications for fostering self-sufficiency among basic school learners with special needs. It concludes that purposeful adoption of creative teaching methods can significantly improve learning outcomes for learners with disabilities, provided that systemic barriers are addressed to ensure equitable access to quality, needs-based education.

Keywords: Creativity, Science Education, Inclusive Special Education, Self-Sufficiency, Basic Education.

Introduction

Ideally, education is supposed to be a bedrock of an individual's, wealth (irrespective of status) and health of a nation's progress, empowering people to contribute meaningfully and functionally to a society's advancement. Akande (2022) confirms that education is the key to the development of both the human and natural resources of a nation. It has been recognized as a crucial tool for national development, driving economic growth, fostering social cohesion, and nurturing future generations; especially if anchored on creative science and values education for combating national development challenges (Amoor, 2023; Ayua & Terhemba, 2025; Ode et al., 2019). However, for this truth to be actualised, basic education which is the foundation to any step-forward in education may be made inclusive special education and accessible to all school eligible learners' and self-sufficient regardless of all round status. Inclusive special education is an important part of practical development, particularly in developing nations like Nigeria, where learners with varied needs want attention. One of the actual ways to guarantee that education meets the needs of all learners, including those with disabilities, is by incorporating creativity into inclusive science education. This approach could nurture creative and critical thinking (Ayua, 2019), problem-solving, and innovation, thereby encouraging self-sufficiency among all school eligible learners in inclusive Basic education level. Basic Education in Nigeria, as defined by the Federal Republic of Nigeria (2013), is provided to children aged 0-15 years with the objectives of fostering a strong consciousness for education, ensuring compulsory, free, and universal access for all eligible children, reducing dropout rates, and equipping learners



Leveraging Creativity in Science Education: Inclusive Special Education's Pathway to ... Ayua, G. A., Et. al. (2026)

with literacy, numeracy, communicative, life, and civic skills for lifelong learning and self-reliance. However, the attainment of these objectives in creativity in science education at the basic school level is constrained by structural and professional challenges, as Ayua et al. (2026) observed that inadequate instructional materials, insufficient laboratory facilities, overcrowded classrooms exceeding the 1:35 teacher-pupil ratio, and limited time allocation hinder effective curriculum implementation by restricting practical activities and learner participation. Consequently, addressing these challenges through improved resources, reduced class sizes, enhanced facilities, and continuous teacher professional development, backed by strong institutional support, is essential for realizing the goals of creativity in science education at the basic school level that would produce self-reliant individuals. To be self-reliant is a desirable trait of personality. In this 21st century, the demand to encourage learners to learn constantly increases exponentially as such in this industrial era where work situations are dynamically complex and more unpredictable; which children wish their teachers and parents knew (Ayua, 2021; Hoepfner & Koch, 2015). In order to create such a learning environment in the school, the proportion of responsibilities between teachers and its learners in doing actions in class has shifted a lot more to the learners. Teachers are no longer seen as the sole transmitters of knowledge, values and skills but rather as facilitators who are responsible for creating a suitable creative inclusive special learning environment.

Inclusive special education is the incorporation of eligible schoolchildren with disabilities into mainstream classrooms, making sure that they receive adequate support to participate fully in learning activities (Adetoro, 2019). In Nigeria, inclusive education is a growing concern, especially at the basic education level, where access to quality education for learners with disabilities remains limited due to inadequate resources, teacher preparation, and societal stigma (Obiakor & Offor, 2021). To promote inclusion, the Universal Basic Education (UBE) program in Nigeria mandates that schools accommodate children with special needs. Nigeria in her efforts has approved the United Nations' Convention on Rights of Persons with Disabilities (UNCRPD) which is part to Article 24 which provides that, all schools must be inclusive of and accessible to all children including those with disabilities. Moreso, Nigeria has signed-up to the 17 Sustainable Development Goals (SDGs), Goal 4 of which targets that by 2030, all school-age children including those with disabilities must have access to quality and functional education. However, implementation has been slow due to systemic challenges. Creativity in science education can provide a practical solution to these issues by creating learning environments that cater to diverse learning needs (Onyebuchi & Nwafor, 2020). Creativity in science education involves engaging learners with varied needs in activities that require innovative thinking and the application of scientific concepts to real-world problems. This approach encourages mind-on, hands-on learning and experimentation, which can be particularly beneficial for learners with disabilities, as it allows them to explore concepts at their own pace and using methods that align with their abilities (Gibson et al., 2020). Incorporating creative methods in teaching science can also make abstract concepts more accessible to all learners, particularly those with learning disabilities (Ayua 2019; Ayua & Eriba, 2023; Olayemi, 2021). For instance, using visual aids, models, and experiments can help demystify complex scientific ideas, making them easier for learners to grasp. Such methods align with Universal Design for Learning (UDL), which advocates for multiple means of engagement and representation in the inclusive science education classroom.

Science education, when taught creatively, equips learners with wisdom, understanding, knowledge and all kinds of skills that can contribute to learners of different needs' self-sufficiency. Learners engage in problem-solving activities that mirror real-life challenges, helping them develop creative and critical thinking and technical skills necessary for the labour force. For learners with special needs, this is particularly vital, as since they often face additional difficulties to employment and self-reliance (Uche & Nweze, 2019). Through the incorporation of creative inclusive science education, learners with disabilities can be taught creative skills in fields like Basic Science, Agricultural Science, Information and Communication Technology (ICT), and health sciences (Physical and Health Education - PHE). These fields offer opportunities for self-employment and entrepreneurship, which can help reduce the dependence of learners with disabilities on external support (Bello & Muhammad, 2018). By fostering creativity, teachers can help learners develop innovative solutions to societal problems, preparing them for a productive and self-reliant future.

Creative Inclusive Science Education (CISE) and its Strategic Implementation

Creative Inclusive Science Education (CISSE) is a transformative approach that goes beyond the mere transmission of scientific facts. It involves teaching science in a way that encourages learners of all kinds to think creatively, critically,

Leveraging Creativity in Science Education: Inclusive Special Education's Pathway to ... Ayua, G. A., Et. al. (2026)

engage in minds-on, hands-on activities, and apply their knowledge to solve real-world problems for self-sufficient and even for national development. The incorporation of creativity in inclusive science education helps to spark curiosity, foster innovation, and empower learners particularly with disabilities to become proactive contributors to their lives, the immediate community and the society at large. Strategically implementing CISSE involves adopting methods that prioritize universal design for learning, interactive learning environments, problem-based learning, and the use of technology to facilitate scientific discovery. Teachers play a critical role by using innovative instructional materials, fostering collaboration among learners of all kinds, and connecting scientific principles to everyday life. Such an approach ensures that learners do not only understand scientific theories but also acquire the skills to innovate solutions to challenges faced by learners themselves and in the national development (Smith & Johnson, 2022). Creative Inclusive Special Science Education (CISSE) is an educational pattern that emphasizes the incorporation of creativity with scientific learning. Unlike the old-style of science teaching, which often focuses on rote memorization and standardized testing, CISSE encourages experiential learning, creative and critical thinking, and the application of scientific principles to real-world problems (Robinson, 2011). By fostering an environment where creativity and scientific inquiry coexist, CISSE aims to develop innovative thinkers regardless of learners' status capable of addressing national complex challenges. According to researches implementing CISSE strategically involves several key components (Organisation for Economic Co-operation and Development - OECD, 2018):

- i. **Curriculum design:** Integrating creative projects, interdisciplinary studies, and problem-based learning into the inclusive special science education curriculum.
- ii. **Teacher training:** Equipping educators with the minds-on, hands-on skills and methodologies to foster creativity in the inclusive special education classroom through professional development programmes.
- iii. **Learning environment:** Creating spaces that encourage creativity, experimentation, collaboration, and exploration, such as laboratories, maker spaces, and innovation hubs. Above all, the environment should be creative in nature to cater for all learners including those with disabilities (inclusive special education).
- iv. **Assessment methods:** Moving beyond outmoded assessments (standardised testing such as academic performance test) to include evaluation of creativity, critical thinking, and practical application of the acquired knowledge to meet the demands of inclusive special education.
- v. **Policy support:** Securing governmental and institutional support to prioritize creative inclusive special science education within the national inclusive special education framework.

By so doing, benefits such as enhancement of creative thinking, critical thinking and problem-solving skills would be achieved by inclusive special education. Fostering innovation and adaptability among inclusive special learners. Bridging the gap between theoretical knowledge and practical application and preparing inclusive special education learners for the demands of a dynamic workforce encouraging self-sufficiency and stability.

Major Problems Militating against Creative Inclusive Special Science Education to Practice

Inclusive special Science education in Nigeria faces numerous problems that impede its effective implementation. These problems cut across infrastructural inadequacies, funding constraints, lack of trained personnel, societal stigma, and ineffective policy enforcement.

Inadequate infrastructure: A significant problem to creative inclusive special science education in Nigeria is the lack of appropriate infrastructure. Most basic schools are not designed to accommodate learners with special needs, especially in rural areas. Facilities such as ramps, accessible classrooms, assistive devices, and specialized learning environments are largely absent in many Nigerian basic schools (Ajuwon, 2018). This makes it difficult for learners with disabilities to access science education classrooms and other school facilities, thereby limiting their participation in mainstream education.

Insufficient funding: The underfunding of inclusive education is another major problem. The budgetary allocation to education in Nigeria is generally low, and even less is allocated to special education programs. As a result, there are inadequate resources for the procurement of indispensable materials, such as braille machines, hearing aids, and communication devices for learners with special needs (Obiakor, 2020). Furthermore, schools often lack sufficient funds to employ and retain specialist teachers and caregivers who can provide the necessary support for learners with disabilities.

Lack of teacher training: Teachers in mainstream schools are often not adequately trained to handle learners with special needs. Many Nigerian teachers lack the required knowledge and skills to implement creativity in inclusive teaching practices effectively (Afolabi et al., 2019). This creates a significant gap in the delivery of creativity in inclusive education,

Leveraging Creativity in Science Education: Inclusive Special Education's Pathway to ... Ayua, G. A., Et. al. (2026)

as teachers struggle to modify their instructional methods, classroom management techniques, and evaluation strategies to meet the diverse needs of all learners. Moreover, continuous professional development programs for teachers, aimed at enhancing their competence in special education, are limited.

Negative societal attitudes and stigma: Societal attitudes towards disability children is another critical problem to inclusive education. Cultural beliefs in Nigeria often stigmatize individuals with disabilities, viewing them as dependent or incapable of contributing meaningfully to society (Adejumo, 2021). This social stigma translates into discrimination within the school environment, where learners with disabilities may be marginalized by their peers and teachers. Parents of children with disabilities are also discouraged from enrolling their children in mainstream schools due to fears of social rejection and discrimination.

Policy implementation gaps: While Nigeria has made efforts to implement policies promoting inclusive education, there is still a significant gap between policy formulation and practice. The National Policy on Education emphasizes the need for inclusive education, yet there are discrepancies in how these policies are executed at the national, state and local levels (Ajuwon & Brown, 2019). Often, there is inadequate monitoring and evaluation of inclusive education programs, and many basic schools do not adhere to the guidelines provided by the Ministry of Education. Moreover, coordination between governmental agencies responsible for special education services is often weak, resulting in fragmented support systems for learners with special needs.

Limited awareness and advocacy: Another issue is the lack of awareness and advocacy surrounding inclusive education. Many parents, teachers, and community members are unaware of the rights of children with disabilities to access mainstream education. Consequently, advocacy efforts to promote inclusive education remain limited. Awareness campaigns targeting both educators and the general public are needed to foster a better understanding of the importance of inclusive education to practices (Afolabi et al., 2019).

Cultural and religious barriers: Cultural and religious beliefs also hinder the successful practice of inclusive education in Nigeria. In certain communities, disabilities are sometimes attributed to spiritual or superstitious causes, leading to further marginalization of learners with special needs (Adejumo, 2021). These beliefs discourage parents from seeking appropriate educational services for their children and contribute to the exclusion of such children from mainstream schooling.

Creativity as Pathways to Creative Inclusive Special Education Problems in Nigeria

Creative Inclusive special education in Nigeria faces various problems such as inadequate teacher training, lack of resources, poor infrastructure, and weak policy implementation. These problems hinder the proper incorporation of learners with disabilities into mainstream education. However, creativity in science education offers various pathways to address these challenges by encouraging creative teaching strategies, developing adaptive learning materials, and fostering an inclusive school culture.

Creative teaching strategies: One of the critical pathways to solving inclusive special education problems is the use of creative teaching strategies. Science education can be transformed through creative methods that adapt to the diverse needs of learners. Ayua and Eriba (2023), Olajide and Olanrewaju (2021) and Ayua (2019) maintained that constructivist teaching strategies such as creative exploration, Torrance incubation model of creative-teaching, problem-based learning and the likes in conjunction with creativity-based assessment techniques when applied in science classrooms, learners with different abilities could enthusiastically collaborate in the learning activities and apply the gained knowledge and skills in solving real-world science problems. This implies that these teaching methods could promote creative and critical thinking, teamwork, and inclusiveness. Thus, in utilizing creative teaching tactics, science educators can engage learners with disabilities in meaningful learning activities, making them active participants in the learning process rather than passive recipients (Ode, et al., 2019).

Developing adaptive learning materials: Creativity in inclusive science education can lead to the development of adaptive learning materials personalised to meet the needs of all learners including those with disabilities. For instance, tactile models can be used to teach visually impaired learners about complex scientific concepts such as the structure of molecules or the human body (Aina & Adeniyi, 2018). Similarly, interactive and multimedia resources can be adapted to suit the needs of all learners with hearing impairments. These creative materials enhance the learning experience for learners with disabilities, allowing them to grasp scientific concepts in a way that out-of-date lesson delivery materials and methods may not provide.



Leveraging Creativity in Science Education: Inclusive Special Education's Pathway to ... Ayua, G. A., Et. al. (2026)

Incorporating assistive technology: The incorporation of assistive technologies is another pathway for addressing the problems of creative inclusive special science education in Nigeria. Creative inclusive special science education can incorporate the use of tools like speech recognition software, screen magnifiers, and communication devices that support learners with disabilities in accessing scientific content (Akpan & Beard, 2019). For example, learners with physical disabilities can use robotics kits to engage in practical science experiments, which would otherwise be difficult to perform manually. These technologies not only enhance accessibility but also foster independence and confidence among learners.

Collaborative learning and peer support: Creativity in inclusive special science education encourages collaborative learning, where learners with disabilities can work alongside their peers. Group-based science projects, where learners of varying abilities collaborate, foster a sense of inclusion and promote mutual understanding (Salami, 2022). Peer tutoring programs can also be introduced, where learners without disabilities assist those with disabilities in science lessons. This approach creates a supportive learning environment where learners with disabilities feel valued and included.

Teacher training in creative inclusive special science education: Providing teachers with training in creative inclusive science education is essential for inclusive education to thrive. Many Nigerian teachers lack the specialized skills needed to support learners with disabilities in science subjects (Ajuwon & Craig, 2020). Training programs should focus on equipping teachers with the knowledge, wisdom, understanding and all kinds of skills to use creative teaching methods that accommodate all learners. For instance, science teachers can be trained on how to simplify complex scientific concepts using analogies, visual aids, minds-on and hands-on experiments, making science more accessible to learners with cognitive impairments.

Curriculum flexibility and differentiation: Creativity in inclusive science education also involves making the curriculum supple enough to accommodate diverse learners. Science curricula can be differentiated to cater to the individual needs of learners with disabilities (Aina & Adeniyi, 2018). This includes breaking down lessons into smaller, more manageable components, using a variety of teaching aids, and incorporating multiple modes of assessment to evaluate student understanding. Curriculum differentiation ensures that all learners, regardless of their abilities, can engage meaningfully with science content.

Promoting inclusivity through extracurricular science activities: Extracurricular activities, such as science clubs, fairs, and competitions, can be designed to include learners with disabilities. These activities provide opportunities for learners with disabilities to showcase their talents and engage in creative problem-solving outside the traditional classroom setting (Salami, 2022). For instance, learners can participate in science exhibitions where they present innovative solutions to real-life challenges, reinforcing their skills and boosting their confidence.

Educational Implications for Inclusive special Education Self-Sufficiency in Nigeria

Inclusive special education aimed to provide equal learning opportunities for all learners, regardless of their disabilities, in mainstream classrooms. In Nigeria, the drive for inclusive education is gradually gaining momentum, although significant challenges remain. The key focus is to empower individuals with special needs to achieve self-sufficiency through quality education, thereby improving their social, economic, and personal outcomes. Here are the educational implications of inclusive special education for self-sufficiency in Nigeria:

Curriculum Adaptation: A major implication of inclusive education in Nigeria is the need for curriculum adaptation. Standard curricula are often not designed to cater to the specific needs of learners with disabilities. According to Ayua and Eriba (2023), special education curriculum or methods are those modified to accommodate students with special needs or persons with learning disabilities like the blind, deaf and dumb, physically challenged or deformed besides learners with difficulty in organizing information, speaking, reading, spelling and writing; also, mental health disorders such as mood, psychotic, eating or personality disorders. Therefore, it is essential to adapt the content, teaching methodologies, and assessment procedures to ensure that learners with diverse needs can access and benefit from creative science education (Olayiwola, 2021). This could include using creative resources for learners with visual impairments or providing simplified texts and augmented communication tools for learners with cognitive disabilities. Without these adaptations, learners with special needs may struggle to develop the creative skills necessary for self-sufficiency

Teacher training and professional development: Effective inclusive education demands well-trained teachers who can handle diverse classroom needs. Unfortunately, many Nigerian teachers lack adequate training in special education (Adeniran & Ayoade, 2020). This is sadly confirmable as many teacher training institutions of higher education in Nigeria do not include in their teacher training programmes even one core course in special needs education, yet over 90% of

Leveraging Creativity in Science Education: Inclusive Special Education's Pathway to ... Ayua, G. A., Et. al. (2026)

schools in Nigeria are inclusively ran. Teachers need to understand different disabilities, be skilled in using assistive technologies, and be patient and empathetic in addressing the challenges faced by special needs learners. Regular professional development programs for teachers are crucial to ensure they can create an inclusive environment that promotes self-sufficiency among all learners.

Use of assistive technology: Another critical educational implication is the incorporation of assistive technology in basic schools. In Nigeria, the use of assistive devices, such as screen readers, hearing aids, and other supportive tools, is limited due to financial constraints and lack of awareness (Ibrahim, 2019). These tools are essential for enabling learners with disabilities to actively participate in the learning process and achieve self-sufficiency. The government and private sector must work together to ensure these technologies are available and accessible to all learners.

Policy implementation and monitoring: Nigeria has enacted several policies aimed at promoting inclusive education, including the National Policy on Special Needs Education (Federal Ministry of Education -FME, 2015). However, the practice of these policies remains a problem due to inadequate funding, lack of political will, and insufficient monitoring mechanisms (Abang & Effiong, 2022). Strengthening policy practice and establishing monitoring bodies to assess the progress of inclusive education initiatives are critical to ensuring that learners with disabilities can achieve self-sufficiency through creative science education.

Inclusive classroom practices: Inclusive education encourages the use of differentiated instruction, cooperative learning, and peer tutoring to meet the diverse needs of learners. By applying such practices, Nigerian basic schools can help foster a supportive learning environment where learners with special needs can acquire the skills necessary for self-sufficiency (Onyejiaka, 2020). Furthermore, inclusive practices help to promote empathy and social skills among non-disabled peers, which can contribute to a more inclusive society overall.

Parental and community involvement: Inclusive education requires the involvement of parents and communities to be fully successful. Parents of schoolchildren with disabilities need to be engaged in their child's learning process and informed about the available support systems. In the same way, community awareness programs can help break down the stigma surrounding disabilities and encourage a more inclusive mindset, which is essential for fostering self-sufficiency in individuals with disabilities (Omojuwa, 2021).

Conclusion

Education underpins individual prosperity and national development. In Nigeria, Basic Education aims to provide free, compulsory access for learners aged 0–15, equipping them with essential skills for self-reliance. However, creativity-driven science education is hindered by inadequate resources, overcrowded classrooms, poor infrastructure, insufficient teacher training, limited funding, stigma, and weak policy implementation. Creative Inclusive Special Science Education addresses these challenges by integrating creativity, critical thinking, and universal design to engage all learners in hands-on scientific inquiry.

Way Forward

1. Nigeria must improve infrastructure and resources, increase funding, strengthen teacher training, adopt flexible curricula, raise public awareness, and leverage assistive technology and inclusive activities.
2. Strategic implementation will enable Basic Education to achieve its goals and empower all learners as self-reliant contributors to national development.

References

- Abang, O. & Effiong, P. (2022). Policy implementation challenges for inclusive education in Nigeria: A critical review. *Journal of Special Needs Education*, 15(3), 45-60.
- Adejumo, O. (2021). Cultural perceptions and their impact on inclusive education in Nigeria. *Journal of Inclusive Education Studies*, 4(2), 45-58.
- Adeniran, S. A. & Ayoade, M. O. (2020). Teacher preparation and inclusive education in Nigeria: The way forward. *African Journal of Educational Research*, 8(2), 25-37.
- Adetoro, R. A. (2019). Inclusive education: Challenges and strategies in Nigerian schools. *African Journal of Special Education*, 5(1), 67-79.
- Afolabi, O. A., Yusuf, A., & Ogunniyi, M. (2019). Challenges of inclusive education in Nigeria: Teacher training and preparation. *Nigerian Educational Review*, 11(1), 35-47.
- Aina, J. K., & Adeniyi, O. I. (2018). Creativity in science education: A catalyst for inclusive education. *Journal of Education and Practice*, 9(15), 18-26.



- Leveraging Creativity in Science Education: Inclusive Special Education's Pathway to ...* Ayua, G. A., Et. al. (2026)
- Ajuwon, P. M. (2018). Infrastructure deficits in Nigerian schools and their effects on inclusive education. *International Journal of Special Education*, 33(3), 21-29.
- Ajuwon, P. M., & Brown, J. D. (2019). Policy and practice of inclusive education in Nigeria: Progress and challenges. *African Educational Research Journal*, 7(4), 210-222.
- Ajuwon, P. M., & Craig, K. (2020). Barriers to inclusive education in Nigeria: Perspectives of educators. *International Journal of Special Education*, 35(3), 10-23.
- Akande, J.A.C (2022). *A guide to teacher competency evaluation*. University Press.
- Akpan, I. J., & Beard, J. (2019). Technology and inclusion: The role of assistive technologies in inclusive education in Nigeria. *Journal of Disability Studies*, 24(2), 5-12.
- Amoor, S. S. (2023, December). *Curriculum delivery in the 21st century for the attainment of national development*. Lead paper at the 2nd National Conference of the Faculty of Education, Federal University of Lafia, Nasarawa State, Nigeria held at Mallam Adamu Adamu Twin Lecture Theatre.
- Ayua, G. A. (2019). Creative-Teaching of science in the 21st century. In P. O. Agogo and E. E. Otor (Eds.), *Methods and Resources in Science Teaching in Nigeria* (PP 174-192). Optimism Academic Publishers.
- Ayua, G. A. (2021, July). *Child education: What children wish their teachers and parents knew*. A Keynote Speech Delivered on the Occasion of the 4th Graduation and Prize-Giving Ceremony of Vertex Nursery and Primary School, Makurdi, Benue State, Nigeria. <https://www.researchgate.net/publication/354438368>
- Ayua, G. A. & Eriba, J. O. (2023). Adapting creative-teaching of Basic Science in special needs education. In J. A. Ademokoya, N. Akuma, E. O. Idiodi & S. O. A. Obih (Eds.), *Special Needs Education from the Lens of Interdisciplinary Dialogue* (PP 314 - 325). Citihall International.
- Ayua, G. A. & Terhemba, W. K. (2025). Creative science and values education for combating top-10 national development challenges in Nigeria. In E. E. Achor, S. A. Iyekekpolor, J. B. Omonu, S. U. Mabera, B. Ojobor & E. Ikpe (Eds.), *Educational Responses to Contemporary Challenges in National Development*, (PP.377-392). Decapacem Int. Ltd. <https://www.researchgate.net/publication/394170433>
- Ayua, G. A., Tofi, M., Omega, J. O., Godo, S. T., Ogah, A. H., & Bebatso, M. G. (2026). Dilemmas faced by teachers in implementing the science curriculum in public basic schools in Makurdi Metropolis. *Faculty of Natural and Applied Sciences Journal of Mathematics, and Science Education*, 7(3), 55-63. <https://doi.org/10.63561/fnas-jmse.v7i3.1169>
- Bello, M., & Muhammad, S. (2018). Vocational skills acquisition in special education: A tool for self-reliance of disabled learners. *Journal of Education and Vocational Studies*, 12(2), 99-113.
- Federal Ministry of Education - FME. (2015). *National policy on special needs education*. Federal Ministry of Education.
- Federal Republic of Nigeria - FRN. (2013). *National policy on education*. Nigeria Educational Research and Development Council (NERDC) Printing Press.
- Gibson, K., McKeown, S., & Jones, P. (2020). The role of creativity in science education: A pathway to inclusive learning. *Science Education Review*, 29(4), 203-215.
- Hoepfner, H. D. & Koch, H. (2015). *Self-reliant learning in technical education and vocational training*. http://tvet-online.asia/wp-content/uploads/2020/03/PWP_vol-4_Hoepfner_Koch.pdf.
- Ibrahim, A. (2019). Assistive technology and inclusive education: Challenges and opportunities in Nigeria. *Nigerian Journal of Educational Technology*, 12(1), 78-89.
- Obiakor, F. E. (2020). Funding challenges in inclusive education in Nigeria. *Journal of Special Needs Education*, 15(2), 102-114.
- Obiakor, F. E., & Offor, N. (2019). Promoting inclusive practices through collaborative problem solving. *International Journal of Special Education*, 34(3), 67-78.
- Ode, J. O., Ayua, G. A. & Alabi, O. A. (2019, August). *Towards enhancing the entrepreneurial skills of primary school pupils through creative teaching of Basic Science*. Paper at the Annual Conference on Creativity, Innovation and Entrepreneurship Education: Harvesting from the Cradle. Organised by Faculty of Education, University of Nigeria Nsukka (UNN), and Held at Princess Alexandria Auditorium (PAA), UNN.
- Olajide, A., & Olanrewaju, T. (2021). Teacher professional development and inclusive education: Implications for Nigeria. *African Journal of Special Needs Education*, 8(1), 45-58.
- Olayemi, K. (2021). Enhancing science learning for students with disabilities through creative approaches. *International Journal of Inclusive Education*, 17(3), 225-238.
- Olayiwola, R. (2021). Adapting the Nigerian curriculum for students with special needs: A case study. *International Journal of Curriculum Studies*, 14(4), 112-130.
- Omojuwa, T. (2021). Parental involvement in inclusive education in Nigeria: An empirical analysis. *Journal of Social Education Research*, 9(1), 101-117.

Leveraging Creativity in Science Education: Inclusive Special Education's Pathway to ... Ayua, G. A., Et. al. (2026)

Onyebuchi, I., & Nwafor, V. (2020). Achieving inclusive education through creativity in the classroom: A focus on science education. *Journal of Contemporary Issues in Education*, 8(2), 114-128.

Onyejiaka, S. (2020). Inclusive classroom practices in Nigerian schools: A review of the literature. *Journal of Inclusive Education*, 6(2), 33-49.

Organisation for Economic Co-operation and Development (OECD). (2018). *OECD economic outlook 2018*. OECD Publishing.

Robinson, J. P. (2011). *Media consumption and civic engagement: New forms of participation*. Cambridge University Press.

Salami, M. (2022). Collaborative learning in inclusive classrooms: The role of science education. *Nigerian Journal of Educational Research*, 14(2), 23-35.

Smith, J., & Johnson, L. (2022). *Creative Science Education: Principles and Practices*. Educational Excellence.

Uche, C. I., & Nweze, C. J. (2019). Science education and self-reliance in Nigeria: The way forward for special needs learners. *Journal of Science and Technology Education*, 6(1), 55-66.