

THE 4Cs AS A FRAMEWORK FOR RETHINKING THE PURPOSE OF PHYSICAL EDUCATION IN SCHOOLS

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Abstract

The evolving demands of 21st-century education necessitate a reimagining of Physical Education (PE) in schools. This article proposes the 4Cs Communication, Collaboration, Critical Thinking, and Creativity as a transformative framework for PE, moving beyond traditional physical fitness goals to foster holistic student development. By integrating the 4Cs, PE can enhance cognitive, social, and emotional skills, preparing students to address global health and societal challenges. This approach aligns with modern educational reforms, emphasising lifelong learning and well-being. However, challenges such as inadequate teacher training, resource limitations, and societal perceptions must be addressed for effective implementation. This paper explores the theoretical foundations of the 4Cs, their integration into PE, and the benefits of this holistic approach, offering recommendations for curriculum redesign, teacher training, and policy reforms.

Keywords: 4Cs, physical education, curriculum development, critical thinking, creativity

Introduction

Physical Education (PE) has historically focused on developing students' physical fitness, motor skills and sports participation, serving as a means to promote health and discipline through structured physical activities (Kirk, 2019). The conventional PE curriculum has often prioritised physical energy and athletic performance, reflecting a limited scope that largely overlooks the broader developmental needs of learners. This traditional approach, while beneficial for physical well-being, has not kept pace with the evolving demands of modern education and society. In today's complex, fast-paced world, education must go beyond rote learning and physical development to cultivate essential life skills that prepare students for real-world challenges. The shift towards 21st-century learning emphasises competencies such as Communication, Collaboration, Critical Thinking, and Creativity collectively known as the 4Cs (Trilling & Fadel, 2020). These skills are now considered foundational for learners to succeed in a dynamic, technology driven and interconnected global environment. However, their integration into subject specific areas like Physical Education remains underexplored.

This paper argues that the inclusion of the 4Cs into PE presents a transformative opportunity to redefine its purpose in schools. Rather than viewing PE specially as a vehicle for physical development, this framework envisions it as a multidimensional learning space where cognitive, emotional, and social skills are also nurtured. Incorporating the 4Cs into PE can lead to richer educational experiences, foster lifelong learning habits, and equip students to face complex health, social and global challenges (Partington, 2021). By rethinking PE through the lens of the 4Cs, educators and policymakers can bridge the gap between physical education and holistic student development. This paper explores the theoretical footings of the 4Cs, how they align with the goals of contemporary education, and the practical strategies for implanting them into PE curricula. It also addresses the systemic challenges that may hinder implementation and offers recommendations for curriculum innovation, teacher capacity building, and policy reform.

Theoretical Foundations of the 4Cs in Education

The 4Cs communication, collaboration, critical thinking, and creativity have been identified as crucial components of 21st-century education. These skills are vital for preparing students to navigate the demands of an increasingly interconnected and complex world (Bellanca & Brandt, 2019). The 4Cs align with broader educational frameworks such as UNESCO's Education for Sustainable Development and the World Health Organisation's (WHO) initiatives on health promotion in schools (WHO, 2018; UNESCO, 2020). Their inclusion in PE can bridge the gap between physical activity and holistic student development. Communication in education refers to the ability to effectively exchange ideas, express thoughts, and interact constructively with others (Johnson & Johnson, 2019). In PE, communication is critical for teamwork, leadership, and coordination in sports and group exercises. Effective verbal and non-verbal communication fosters cooperative learning, enhances sportsmanship, and improves students' confidence in social interactions (Gould & Carson, 2020). Collaboration is an essential skill that enables individuals to work together to achieve shared goals. In PE, collaborative learning experiences promote teamwork, peer support, and collective problem-solving (Dudley et al., 2017). When students engage in cooperative activities, they develop interpersonal skills and learn the value of working harmoniously with diverse individuals, reinforcing social-emotional learning in educational settings (Casey & Goodyear, 2018).

Critical thinking involves analysing information, making informed decisions, and solving problems effectively. In PE, students engage in strategic thinking when planning game tactics, evaluating fitness routines, and adapting to different sports scenarios (Ennis, 2019). Encouraging critical thinking in PE fosters adaptability, decision-making, and resilience, which are crucial for both athletic and personal development. Creativity is the ability to generate new ideas, innovate, and think outside the box. In PE, creativity can be demonstrated through designing new games, modifying traditional sports, and exploring different movement styles (Bailey et al., 2021). Encouraging creative expression in PE not only enhances students' engagement but also cultivates their ability to develop solutions to challenges in both physical activities and real-life situations. The integration of the 4Cs into PE aligns with modern educational reforms aimed at fostering well-rounded individuals equipped for the demands of the 21st century (Trilling & Fadel, 2020). By adopting this approach, PE can move beyond traditional models and become a dynamic, student-centred discipline that contributes to lifelong learning and well-being.

Rethinking Physical Education Through the 4Cs

Communication plays a crucial role in PE, as it enhances teamwork, leadership, and coordination during physical activities. According to Ogu (2021), effective communication in PE settings helps students develop confidence and improves their ability to express ideas, both verbally and non-verbally. This is particularly important in African schools, where group participation in sports fosters unity and social cohesion (Okonkwo, 2019). Encouraging structured communication strategies, such as peer feedback and reflective discussions, enables students to articulate their thoughts and collaborate effectively in sports and fitness activities. Collaboration in PE promotes teamwork and social interaction, essential for building cooperative learning environments. Adebayo and Olayemi (2020) emphasise that engaging students in group sports and fitness activities enhances their ability to work harmoniously with peers from diverse backgrounds. This is particularly relevant in Nigerian schools, where team-based activities

strengthen social skills and mutual respect among students (Chukwu, 2018). Integrating collaborative exercises such as relay races and team sports into PE curricula fosters a sense of belonging and encourages cooperative problem-solving.

Critical thinking is essential in PE, as it enables students to analyse game strategies, make informed decisions, and develop problem-solving skills. Research by Eze (2021) highlighted that incorporating decision-making tasks into PE helps students improve their cognitive abilities while engaging in sports. For instance, students who participate in tactical games like soccer or basketball learn to evaluate different play strategies, adapt to changing game conditions, and make quick, strategic decisions (Akinyele, 2019). This skill is vital in preparing students for real-life situations requiring analytical thinking and adaptability. Creativity in PE encourages students to innovate new games, modify existing sports, and explore diverse movement styles. According to Nwankwo (2022), introducing creative activities such as freestyle gymnastics and adaptive sports fosters imagination and problem-solving. African cultures have historically incorporated creative physical expressions, such as traditional dance and indigenous sports, into education, making creativity an integral component of PE (Obi, 2020). By allowing students to design their own games and experiment with movement patterns, PE can become a platform for fostering ingenuity and self-expression.

Benefits of Integrating the 4Cs in Physical Education

The integration of the 4Cs in Physical Education (PE) offers numerous benefits that extend beyond physical fitness to cognitive, social, and emotional development. A well-structured PE program that incorporates communication, collaboration, critical thinking, and creativity can transform the traditional perception of PE as merely a subject for physical activity into a platform for holistic development. Research by Adekunle (2021) and Balogun (2019) suggests that students who engage in communication and collaboration-based PE activities demonstrate improved leadership skills, social confidence, and teamwork abilities, all of which are essential for success in life beyond school. One of the primary benefits of integrating the 4Cs in PE is the enhancement of social skills. Communication and collaboration are fundamental in team sports such as football, basketball, and volleyball, where players must coordinate movements, develop strategies, and provide feedback to teammates. For example, in a football game, effective communication ensures that players can anticipate each other's movements, increasing their chances of success. This skill is transferable to real-world scenarios such as workplace collaboration and leadership roles (Adebayo & Olayemi, 2020).

Collaboration in PE fosters teamwork and a sense of collective responsibility. Group exercises, relay races, and cooperative fitness challenges teach students the importance of working together to achieve shared goals. This is particularly beneficial in diverse school environments where students from different backgrounds interact. A study by Chukwu (2018) found that students who participated in collaborative PE activities exhibited better interpersonal relationships and conflict resolution skills, which are crucial for fostering unity in multi-ethnic societies like Nigeria. Critical thinking in PE enhances students' ability to make informed decisions, analyse situations, and develop strategies. This is particularly evident in games that require tactical thinking, such as chess boxing, badminton, or basketball. For example, in basketball, players must decide whether to pass, dribble, or shoot based on their assessment of the game's dynamics. Research by Eze (2021) highlighted that students who engage in strategic PE activities show improved

cognitive flexibility and adaptability, which are essential for academic success and future career development.

Moreover, fitness planning activities in PE encourage students to think critically about their health and wellness. Instead of merely following a set routine, students can be guided to analyse different workout plans, set fitness goals, and track their progress. This approach empowers students with the ability to make informed decisions regarding their physical and mental well-being, fostering lifelong healthy habits (Akinyele, 2019). Creativity plays a crucial role in making PE engaging and enjoyable. Traditional PE lessons often become monotonous, leading to disengagement among students. However, by incorporating creative elements, such as designing new games, modifying existing sports, or introducing freestyle movement activities, PE can become more stimulating. According to Nwankwo (2022), students who are encouraged to create their own exercise routines or sports activities demonstrate higher levels of engagement and enthusiasm. A practical example of creativity in PE is the introduction of indigenous sports and dance forms, such as Dambe boxing (a traditional Nigerian martial art) or Atilogwu dance (a vigorous Igbo cultural dance). These activities not only promote physical fitness but also serve as a means of cultural preservation and identity development (Obi, 2020). Allowing students to integrate their cultural background into PE activities makes learning more meaningful and enjoyable.

Beyond the immediate classroom experience, integrating the 4Cs in PE prepares students for challenges they will face in society. Leadership roles in sports teams mirror real-life leadership scenarios in workplaces and community settings. The problem-solving skills acquired through strategic gameplay can be applied to everyday decision-making, such as managing time effectively or resolving conflicts amicably. In a study conducted by Okonkwo (2019), students who participated in structured PE programs emphasising the 4Cs were more likely to exhibit resilience, adaptability, and a proactive mindset when faced with challenges outside school. Additionally, promoting creativity and innovation in PE encourages students to explore careers in sports science, coaching, physiotherapy, and health education. Many professional athletes and fitness experts attribute their success to early exposure to critical thinking and creative exploration in PE classes (Olawale, 2020). This demonstrates that a well-rounded PE program does not only enhance physical fitness but also contributes to career readiness and lifelong success. Physical health is often the primary focus of PE, but integrating the 4Cs expands its role to include emotional and mental well-being. Communication and collaboration help build strong peer relationships, reducing feelings of isolation and anxiety among students. Critical thinking enables students to make informed choices about their health, such as understanding the impact of nutrition, exercise, and rest. Creativity fosters self-expression, which can be a powerful tool for managing stress and emotional well-being.

For instance, mindfulness-based movement activities such as yoga and dance therapy have been shown to reduce anxiety and improve focus in students (Adekunle, 2021). Incorporating such activities into PE not only improves physical fitness but also provides students with coping mechanisms for handling academic and personal stress. As the World Health Organisation (WHO, 2018) emphasises, integrating mental health strategies into school programs is crucial for overall student well-being. Through embedding the 4Cs into PE, students develop a lifelong appreciation for physical activity. Traditional PE models often focus on short-term fitness goals, but a holistic approach encourages students to view physical activity as an integral part of their lifestyle. Activities such as hiking, cycling, and aerobics, which require teamwork, strategic

planning, and creativity, can be introduced to demonstrate the fun and practicality of staying active beyond school years.

Adebayo and Olayemi (2020) found that students exposed to innovative and engaging PE lessons were more likely to participate in recreational sports and maintain an active lifestyle into adulthood. This shift is particularly significant in combating the rising prevalence of sedentary lifestyles and related health issues such as obesity and cardiovascular diseases in African societies. Lastly, integrating the 4Cs into PE challenges the traditional notion that physical education is separate from academics. Research has shown that students who participate in structured PE activities that incorporate communication, collaboration, and problem-solving perform better in academic subjects (Balogun, 2019). This is because physical activity stimulates cognitive functions, improves concentration, and enhances memory retention. Schools that recognise this interconnectedness can develop interdisciplinary approaches, linking PE with subjects such as biology (understanding human physiology), mathematics (measuring fitness data), and social studies (exploring the cultural aspects of sports).

Challenges and Considerations for Implementation

Despite the numerous benefits of integrating the 4Cs (Critical Thinking, Communication, Collaboration, and Creativity) into Physical Education (PE), several challenges hinder effective implementation, particularly in the Nigerian educational context. These challenges range from inadequate teacher training and curriculum rigidity to infrastructural deficiencies and societal perceptions.

Lack of Teacher Training and Professional Development: One of the major barriers to integrating the 4Cs into PE is the lack of adequate teacher training. Many PE teachers in Nigeria were trained using traditional pedagogical approaches that emphasise physical fitness and skill acquisition over cognitive and social development (Okonkwo, 2020; Adeyemi, 2021). A study by Chukwu (2021) revealed that over 60% of PE teachers in Nigerian secondary schools have not received formal training in contemporary teaching strategies that promote communication, collaboration, critical thinking, and creativity. This knowledge gap makes it difficult for teachers to implement innovative learning approaches effectively. Furthermore, the absence of continuous professional development programs exacerbates the issue. Unlike teachers in core subjects such as Mathematics and English, who often undergo regular refresher courses, PE teachers rarely receive such opportunities (Eze & Akpan, 2019; Adeyemi, 2021). This lack of upskilling results in outdated teaching methodologies, preventing the effective implementation of student-centred instructional techniques. To address this, stakeholders must invest in structured training programs that introduce inquiry-based learning, problem-solving activities, and student-led coaching methods (Uche, 2019).

Curriculum Inflexibility and Resistance to Change: The rigidity of the Nigerian school curriculum presents another challenge to implementing the 4Cs in PE. Although the National Policy on Education (NPE, 2013) mandates PE as a compulsory subject at the basic education level, it is often treated as a non-essential subject with little emphasis on cognitive and social development (Eze & Akpan, 2019; Nigerian National Policy on Sports, 2018). The structured nature of the curriculum does not provide the flexibility needed to integrate innovative teaching methodologies, making it difficult for educators to adopt modern approaches. Resistance to curriculum modifications is another issue. Many schools and educators hesitate to adopt changes due to concerns about increased workload and a strong focus on examinable subjects. Unlike subjects such as Mathematics and

Science, which are prioritised in standardised testing, PE is not given similar attention, making it difficult to justify curriculum restructuring (Adeyemi, 2021; UBEC, 2021). Without clear policy guidelines and incentives, many schools are unlikely to implement an expanded PE framework that incorporates the 4Cs. **Insufficient Sports Facilities and Equipment:** The lack of adequate sports facilities and equipment in many Nigerian public schools also hinders the implementation of collaborative and creative PE activities. According to Uche (2019), most rural schools lack standard sporting infrastructure, which makes it challenging to conduct team-based exercises or innovative physical activities requiring proper equipment. In many cases, students must share limited resources such as footballs, volleyballs, and track facilities, leading to reduced opportunities for creative and collaborative learning (Okafor, 2020; NBS, 2022).

Some PE lessons are conducted in makeshift open spaces without designated playgrounds, further restricting the effectiveness of physical education (Okafor, 2020; UBEC, 2021). Private schools with better facilities tend to implement PE programs more effectively than public schools, highlighting the inequality in access to quality physical education. Addressing this challenge requires government intervention and public-private partnerships to improve sports infrastructure in schools. Additionally, low-cost alternatives, such as community-based partnerships that allow schools to share sports facilities, can help bridge the resource gap (Eze & Akpan, 2019). **Cultural and Societal Perceptions of Physical Education:** Cultural and societal perceptions of PE pose another significant challenge. In many Nigerian communities, PE is still regarded as a non-academic subject with limited value compared to traditional subjects like English, Mathematics, and Science (Okonkwo, 2020; Okafor, 2020). This perception reduces enthusiasm among students, parents, and even educators, limiting the implementation of innovative teaching methods.

Gender biases further compound this issue. Research by Chukwu (2021) indicates that girls face more restrictions in PE participation due to cultural beliefs that prioritise academic success over physical activity. In some cases, parents discourage their daughters from engaging in sports, reinforcing gender disparities in PE programs. Changing these perceptions requires targeted advocacy campaigns and policy interventions that emphasise the holistic benefits of PE in education (NBS, 2022; Nigerian National Policy on Sports, 2018). **Policy and Funding Constraints:** Government policies and funding allocation play crucial roles in determining the extent to which PE programs can be restructured to include the 4Cs. Unfortunately, education funding in Nigeria disproportionately favours core subjects, leaving PE and extracurricular activities underfunded. According to the Nigerian Bureau of Statistics (NBS, 2022) less than 5% of the national education budget is allocated to sports development at the basic education level, making comprehensive PE reforms difficult to implement.

Existing PE policies also lack clear implementation guidelines for integrating cognitive and social skills into physical education. While the Nigerian National Policy on Sports (2018) emphasises physical fitness and talent development, it does not provide a structured framework for incorporating the 4Cs into school curricula (Eze & Akpan, 2019; UBEC, 2021). This policy gap creates inconsistencies in PE instruction across schools, limiting widespread adoption. To address this, policymakers must revise education policies to explicitly integrate the 4Cs into PE standards. Additionally, increased budgetary allocations for sports development, teacher training, and school infrastructure are necessary for successful implementation (Okonkwo, 2020; NBS, 2022). **Overcrowded Classrooms and Time Constraints:** Another practical challenge in implementing the 4Cs in

PE is overcrowded classrooms. Many Nigerian public schools experience high student-teacher ratios, making it difficult for educators to engage students effectively in collaborative and interactive activities. According to the Universal Basic Education Commission (UBEC, 2021), the average class size in Nigerian public secondary schools exceeds 50 students per teacher. Managing such large numbers in a PE setting, where physical movement is required, becomes a logistical challenge (Eze & Akpan, 2019; NBS, 2022).

Additionally, PE is often allocated limited time within the school timetable, sometimes as little as one period per week. This constraint restricts opportunities for structured activities that promote critical thinking, communication, collaboration, and creativity. Schools must reconsider their timetables to allow more dedicated time for PE, ensuring students benefit from its cognitive and social advantages (Okafor, 2020; UBEC, 2021). From the foregoing, integrating the 4Cs into PE presents numerous opportunities for student development; several challenges must be addressed for effective implementation in Nigeria. Key barriers include inadequate teacher training, rigid curricula, insufficient sports facilities, societal perceptions, funding constraints, and overcrowded classrooms. However, with strategic policy reforms, increased investment in teacher development, and enhanced infrastructural support, these challenges can be mitigated. Schools and educational stakeholders must work collaboratively to reposition PE as a vital component of holistic education, ensuring that Nigerian students gain not only physical fitness but also the cognitive, social, and creative skills necessary for success in the modern world.

Conclusion

Integrating the 4Cs Communication, Collaboration, Critical Thinking, and Creativity into Physical Education represents a transformative approach to preparing students for the complexities of the 21st century. By moving beyond traditional models focused solely on physical fitness, PE can become a dynamic platform for holistic development, fostering cognitive, social, and emotional growth alongside physical health. However, successful implementation requires addressing significant challenges, including inadequate teacher training, curriculum rigidity, resource limitations, societal perceptions, and policy gaps. Through strategic reforms, increased investment, and collaborative efforts among stakeholders, PE can be repositioned as a vital component of education, equipping students with the skills and mindset needed for lifelong success and well-being. This holistic approach not only enhances students' immediate educational experiences but also prepares them to navigate and thrive in an increasingly interconnected and complex world.

Recommendations

To effectively integrate the 4Cs Communication, Collaboration, Critical Thinking, and Creativity into Physical Education, the following policy recommendations are proposed to address current challenges and enhance the holistic development of students:

1. Invest in training programs and continuous professional development for PE teachers to equip them with innovative strategies for integrating the 4Cs (Communication, Collaboration, Critical Thinking, and Creativity) into their lessons.
2. Redesign the PE curriculum to explicitly include the 4Cs, incorporating flexible, creative, and collaborative activities such as game design, modified sports, and culturally relevant practices like traditional dances.

3. Increase funding and public-private partnerships to address the lack of sports facilities and equipment, ensuring all schools have access to adequate resources for effective PE programs.
4. Launch advocacy campaigns to promote the holistic benefits of PE and challenge gender stereotypes, encouraging equal participation and cultural inclusivity in physical activities.
5. Advocate for policy reforms and increased budgetary allocations to integrate the 4Cs into national PE standards, ensuring schools have the resources and time needed for effective implementation.

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