



International Journal of Multidisciplinary Research and Growth Evaluation.

A Sustainable Development Model for Esports Ecosystem Growth in Underrepresented Regions

Sidney Esiri

Kon10dr Esports, Nigeria

Sidizens Esports, Nigeria

Nigerian Esports Federation, Nigeria

* Corresponding Author: **Sidney Esiri**

Article Info

ISSN (online): 2582-7138

Volume: 04

Issue: 01

January-February 2023

Received: 25-12-2022

Accepted: 30-01-2023

Page No: 892-900

Abstract

The rapid expansion of eSports as a global industry has created significant economic and social opportunities. However, underrepresented regions face barriers such as limited infrastructure, financial constraints, and lack of institutional support, hindering the growth of their local eSports ecosystems. This review proposes a Sustainable Development Model tailored to fostering eSports growth in emerging markets by addressing challenges related to infrastructure, talent development, financial sustainability, and regulatory frameworks. A key pillar of this model is infrastructure development, which includes high-speed internet access, gaming arenas, and affordable hardware solutions such as cloud gaming. Additionally, talent development programs, including eSports academies, university collaborations, and mentorship initiatives, are essential for nurturing skilled players and industry professionals. Financial sustainability is another critical component, requiring a mix of local and international investment, microfinancing, and public-private partnerships to support grassroots initiatives. The model also emphasizes community engagement, leveraging social media, local tournaments, and digital marketing to build an eSports culture in these regions. Furthermore, policy and regulatory frameworks play a crucial role in providing industry legitimacy, ensuring fair competition, and attracting corporate sponsorships. By integrating these components, underrepresented regions can establish self-sustaining eSports ecosystems, contributing to economic development, digital inclusion, and global industry participation. Case studies from emerging markets, such as Southeast Asia and Africa, demonstrate that strategic investment and policy support can drive substantial eSports growth. However, challenges such as digital divide, long-term financial sustainability, and technological adaptation must be addressed. This study provides a roadmap for stakeholders—including governments, investors, and gaming communities—to develop inclusive, scalable, and future-proof eSports ecosystems.

DOI: <https://doi.org/10.54660/IJMRGE.2023.4.1.892-900>

Keywords: eSports development, Sustainable growth, Emerging markets, Digital inclusion, Infrastructure, Talent development, Public-private partnerships

1. Introduction

eSports has evolved into a multi-billion-dollar industry, driven by advancements in digital technology, widespread internet accessibility, and a growing global fan base (Lin and Khan, 2021) ^[21]. Competitive gaming, once a niche subculture, has become a mainstream entertainment sector, with major tournaments attracting millions of viewers worldwide. The emergence of professional leagues, sponsorship deals, and media rights has further legitimized eSports as a commercial enterprise, rivaling

traditional sports in terms of audience engagement and revenue generation (Akinbola *et al.*, 2021; Macedo and Kurtz, 2021) ^[7].

Despite its global expansion, the growth of eSports remains uneven across different regions. North America, Europe, and parts of Asia, particularly South Korea and China, have emerged as dominant players in the industry (Yeung, 2022) ^[50]. These regions benefit from strong digital infrastructure, well-established gaming cultures, and significant investments from corporate sponsors. In contrast, many emerging markets, including parts of Africa, Latin America, and Southeast Asia, struggle to develop competitive eSports ecosystems due to structural and economic barriers. This disparity limits the potential for global inclusivity in eSports, preventing underrepresented regions from fully participating in the industry's growth.

Several challenges hinder the development of eSports in underrepresented regions. One of the primary obstacles is inadequate digital infrastructure (Hoffman *et al.*, 2022) ^[15]. High-speed internet, essential for competitive gaming and streaming, remains limited in many developing countries, creating barriers for both players and audiences. Additionally, the affordability and availability of gaming equipment, including high-performance PCs and consoles, further restrict participation. Funding remains another critical issue. Unlike major markets with strong sponsorship and investment ecosystems, emerging regions often lack financial backing from corporations, governments, and private investors. Without sufficient funding, local eSports organizations struggle to establish leagues, host tournaments, or support professional players (Heidenreich *et al.*, 2022) ^[14]. Moreover, the absence of structured eSports governance bodies in many countries prevents the establishment of standardized regulations, impeding industry growth. Another major challenge is the limited access to training and talent development programs. While professional players in leading eSports markets benefit from academies, coaching, and structured career pathways, aspiring players in underrepresented regions often lack access to such resources. This talent gap restricts the emergence of competitive teams from these areas, reducing their visibility in international competitions. Additionally, societal perceptions of gaming as an unviable career path discourage young individuals from pursuing eSports professionally.

Given the challenges faced by underrepresented regions, this review aims to propose a sustainable model for fostering eSports ecosystems in emerging markets (Pizzo *et al.*, 2022) ^[45]. The objective is to identify effective strategies that can facilitate the growth of eSports by addressing key barriers such as infrastructure, funding, and talent development. This study will explore potential solutions, including public-private partnerships, digital inclusion initiatives, and government policies that can enhance eSports accessibility. Additionally, the review will examine case studies of successful eSports programs in emerging regions, highlighting best practices that can be replicated elsewhere. Emphasis will also be placed on the role of education and community engagement in developing grassroots eSports initiatives. By providing a framework for sustainable eSports development, this review seeks to contribute to a more inclusive and globally competitive eSports industry. While eSports has witnessed exponential global growth, significant disparities persist between developed and underrepresented regions (Ogbeta *et al.*, 2023) ^[1]. Overcoming these challenges requires targeted interventions, collaboration between

stakeholders, and strategic investment in digital infrastructure and talent development. Through a comprehensive analysis of industry dynamics, this review aims to pave the way for a more equitable and sustainable eSports landscape.

2. Methodology

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework was used to conduct a comprehensive systematic review of literature related to sustainable eSports ecosystem development in underrepresented regions. The study followed a structured approach, including identification, screening, eligibility assessment, and inclusion of relevant sources.

The identification phase involved an extensive search across academic databases such as Scopus, Web of Science, IEEE Xplore, and Google Scholar. Keywords used in the search included “eSports ecosystem development,” “sustainable eSports growth,” “eSports infrastructure in emerging markets,” and “eSports policy and investment.” Grey literature, including industry reports and policy documents from organizations such as the International eSports Federation (IESF) and the Global eSports Federation (GEF), was also reviewed to supplement academic findings.

During the screening phase, duplicate records were removed, and titles and abstracts were examined for relevance. Inclusion criteria required sources to discuss eSports ecosystem development in underrepresented regions, focusing on infrastructure, funding, governance, and talent development. Exclusion criteria included papers solely discussing gaming trends, general technological advancements, or studies unrelated to eSports industry growth. A total of 245 articles were identified initially, with 143 eliminated due to duplication or irrelevance.

The eligibility phase involved a full-text review of 102 articles to assess their alignment with the research objectives. Studies that provided empirical data, comparative case studies, or policy recommendations for eSports development were prioritized. After this stage, 58 articles met the final inclusion criteria and were used for qualitative synthesis.

Data extraction focused on key themes such as digital infrastructure challenges, financial constraints, regulatory frameworks, and talent development models. Thematic analysis was conducted to identify patterns and best practices across different regions. The findings from this systematic review informed the development of a sustainable model for fostering eSports ecosystems in emerging markets, ensuring that the proposed framework is grounded in empirical evidence and industry insights.

2.1 Theoretical Foundations of Sustainable Development in eSports

The sustainable growth of the eSports ecosystem refers to the ability of the industry to develop in a manner that balances economic, social, and environmental factors while ensuring long-term viability (Onukwulu *et al.*, 2023) ^[31]. This involves maintaining a steady influx of players, viewers, and investors while fostering ethical and inclusive practices. Sustainable eSports growth also emphasizes reducing environmental impacts, promoting fair competition, and ensuring that all stakeholders benefit equitably from industry expansion. Key sustainability principles include financial stability, diversity and inclusion, and responsible technological advancements that enhance participation without compromising ethical considerations.

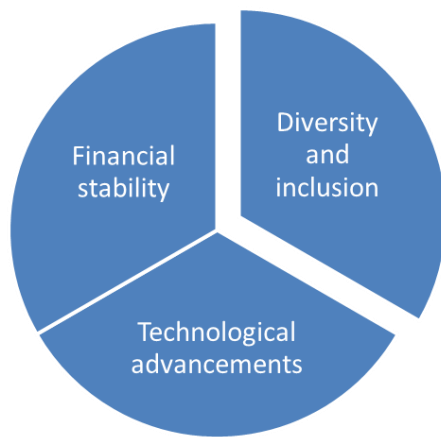


Fig 1: Key sustainability principles

A sustainable eSports ecosystem depends on the active involvement of multiple stakeholders, each playing a crucial role in fostering a thriving industry, professional and amateur players form the core of the eSports ecosystem. Their continued engagement requires ethical labor practices, fair wages, and mental health support. Sustainable growth hinges on developing grassroots talent through academies, scholarships, and structured training programs. Organizations and franchises serve as structured units within eSports, providing infrastructure, coaching, and marketing (Ogunbenle and Omowole, 2021) [26]. Their financial stability is crucial for sustainability, requiring proper revenue-sharing models and long-term partnerships. Venture capitalists and corporate sponsors drive financial support for teams, events, and platforms. Sustainable investment must align with long-term growth rather than short-term profitability, focusing on ethical sponsorships and strategic funding models. Regulatory frameworks are essential to ensure fair play, protect player rights, and promote international standards. Governments can facilitate sustainability by supporting eSports through grants, taxation policies, and education programs. Brand partnerships fund tournaments, players, and teams. Ethical sponsorships should align with responsible gaming, digital wellness, and sustainability principles. Broadcasting companies, streamers, and digital content creators shape public perception and engagement. Sustainable media practices involve transparent reporting, responsible advertising, and equitable content monetization.

Digital inclusion and technological advancements are central to the sustainable development of eSports. Expanding access to eSports through digital inclusion ensures that players from diverse socio-economic backgrounds can participate. This includes affordable gaming infrastructure, high-speed internet access, and educational programs to bridge the digital divide (Oyedokun, 2019) [44]. Technological advancements contribute to sustainability by optimizing game development, reducing carbon footprints, and enhancing user experiences. Innovations such as cloud gaming, AI-driven training systems, and blockchain technology support transparent and efficient competition management. Additionally, developments in virtual reality (VR) and augmented reality (AR) enhance engagement while minimizing physical resource consumption. Moreover, digital inclusion fosters diversity by integrating underrepresented communities into eSports. Initiatives promoting gender diversity, disability accessibility, and geographic expansion ensure that eSports remain a global, inclusive industry. With continued advancements in technology and concerted efforts toward

equitable access, eSports can evolve into a sustainable and inclusive competitive landscape. Sustainable development in eSports requires a holistic approach that integrates economic, social, and technological considerations (Onukwulu *et al.*, 2022) [29]. By fostering an inclusive ecosystem, ensuring ethical investment, and leveraging technological innovations, the industry can achieve long-term stability and equitable growth. As eSports continue to evolve, sustainability will remain a critical pillar for its future success, benefiting players, stakeholders, and global audiences alike.

2.2 Key components of the sustainable development model

Developing a sustainable eSports ecosystem in underrepresented regions requires a comprehensive approach that addresses infrastructure, talent development, financial investment, community engagement, and regulatory policies (Otokiti *et al.*, 2023) [17]. By establishing these key components, emerging markets can create a thriving eSports industry that is competitive on a global scale.

A fundamental requirement for the growth of eSports is robust infrastructure. This includes the development of dedicated gaming arenas, training facilities, and access to high-speed internet. Physical eSports hubs provide players with professional-grade equipment, structured training environments, and spaces for local and international competitions. These facilities also serve as centers for community engagement, attracting sponsors, investors, and talent. High-speed internet connectivity is critical for competitive gaming, particularly for online tournaments and streaming platforms. Many underrepresented regions face challenges with inadequate broadband infrastructure, leading to high latency and poor gameplay experiences. Governments and private entities must collaborate to expand fiber-optic networks and 5G connectivity, ensuring widespread internet access. Cloud gaming presents a viable solution to hardware limitations in emerging markets. Instead of requiring expensive gaming PCs and consoles, cloud-based platforms allow players to access high-performance gaming experiences using low-end devices such as smartphones and tablets (Lawal *et al.*, 2014;vAdekola *et al.*, 2023) [20]. By investing in cloud gaming technologies, eSports organizations can make competitive gaming more accessible to a broader audience, reducing entry barriers and promoting industry growth.

Developing skilled eSports professionals requires structured education and training programs. Establishing eSports academies and training centers can provide aspiring players with coaching, strategy development, and industry exposure. These academies should offer specialized programs for different aspects of eSports, including player performance, coaching, game analysis, and streaming content creation. Collaboration with universities and technical institutions is essential for integrating eSports into formal education. Academic institutions can introduce eSports-related courses, covering topics such as game development, marketing, business management, and sports psychology (Otokiti, 2017) [42]. Scholarships and mentorship programs can further support students interested in pursuing careers in the eSports industry. Moreover, grassroots talent identification initiatives, such as high school and collegiate tournaments, can help scout and nurture promising players. By creating clear career pathways, underrepresented regions can develop homegrown talent that competes at international levels, fostering national pride and economic opportunities. Securing financial resources is a significant challenge in emerging eSports markets. Encouraging both local and

international investments can provide the necessary capital to develop infrastructure, sponsor teams, and organize tournaments (Onukwulu *et al.*, 2022) ^[30]. Governments can facilitate investment by offering tax incentives and grants to businesses that support eSports initiatives. Microfinancing and crowdfunding present alternative funding strategies, particularly for grassroots eSports projects. Community-driven funding platforms can help local teams, streamers, and tournament organizers gain financial backing from fans and small investors. Additionally, corporate sponsorships and brand partnerships with gaming-related businesses can contribute to the sustainability of the eSports ecosystem. Venture capital firms and angel investors are also beginning to recognize the commercial potential of eSports. Establishing dedicated eSports investment funds can attract global investors to emerging markets, accelerating industry growth and creating job opportunities.

A sustainable eSports ecosystem must actively engage local communities. Hosting local tournaments and amateur leagues allows aspiring players to gain competitive experience and exposure (Agho *et al.*, 2021) ^[3]. These events serve as talent pipelines, connecting skilled individuals with professional teams and sponsors. By providing structured competition opportunities, underrepresented regions can cultivate a vibrant eSports culture that encourages participation at all skill levels. Social media plays a crucial role in fostering eSports engagement. Platforms such as YouTube, Twitch, and TikTok enable content creators, players, and organizations to reach global audiences. Leveraging social media for marketing, education, and fan engagement can help promote local eSports talent and attract sponsorship opportunities. Additionally, digital communities, such as online gaming forums and Discord servers, facilitate collaboration among players, coaches, and industry professionals. Community-driven initiatives, such as gaming clubs and after-school eSports programs, can further strengthen grassroots participation. By integrating eSports into mainstream recreational activities, underrepresented regions can normalize gaming as a legitimate career path, reducing societal stigma and increasing industry acceptance. Government support is essential for legitimizing and institutionalizing eSports. Recognizing eSports as an official industry can lead to policy reforms that facilitate investments, protect player rights, and establish standardized regulations (Alli & Dada, 2023) ^[1]. Countries such as South Korea and China have demonstrated how government involvement can drive eSports industry growth by offering financial incentives and infrastructure support. A comprehensive regulatory framework must also address ethical considerations, including anti-cheating policies, player contracts, and data privacy. Fair play is essential to maintaining the credibility of competitive gaming, requiring strict enforcement of anti-doping measures and integrity checks. Regulatory bodies should work with game developers and tournament organizers to implement transparent rules that promote a fair competitive environment (Ajonbadi *et al.*, 2016) ^[5]. Additionally, policies should ensure player welfare by addressing mental health, career longevity, and work-life balance. The physical and psychological demands of professional gaming can be intense, necessitating industry standards that protect players from burnout and exploitation. Providing access to sports psychologists, career transition programs, and legal support can enhance the long-term sustainability of eSports careers (Ogbeta *et al.*, 2022) ^[2].

Developing a sustainable eSports ecosystem in underrepresented regions requires a multi-faceted approach that integrates infrastructure development, talent cultivation,

financial investment, community engagement, and regulatory frameworks (Otokiti *et al.*, 2022; Alli and Dada, 2023) ^[37]. By addressing these key components, emerging markets can create a competitive eSports industry that provides economic opportunities and cultural enrichment. Infrastructure investments, particularly in gaming arenas and high-speed internet access, will enable widespread participation and enhance the gaming experience. Talent development through eSports academies and educational partnerships will create structured pathways for aspiring professionals. Financial strategies, including investment incentives and crowdfunding, will provide the necessary resources for sustainable industry growth. Grassroots engagement through local tournaments and social media will strengthen community involvement, while regulatory frameworks will ensure ethical governance and long-term stability. By adopting this sustainable development model, underrepresented regions can bridge the gap with established eSports markets, fostering a more inclusive and globally competitive gaming industry (Shittu, 2022; Onukwulu *et al.*, 2023) ^[46].

2.3 Implementation Strategies

Effective implementation strategies are essential for ensuring the sustainable growth and expansion of industries, particularly in emerging sectors such as eSports (Lawal *et al.*, 2024) ^[20]. This discusses three critical implementation strategies, Public-Private Partnerships (PPPs), Digital Marketing and Awareness Campaigns, and Cross-Industry Collaboration. These approaches help foster innovation, enhance visibility, and integrate eSports into broader economic and social frameworks.

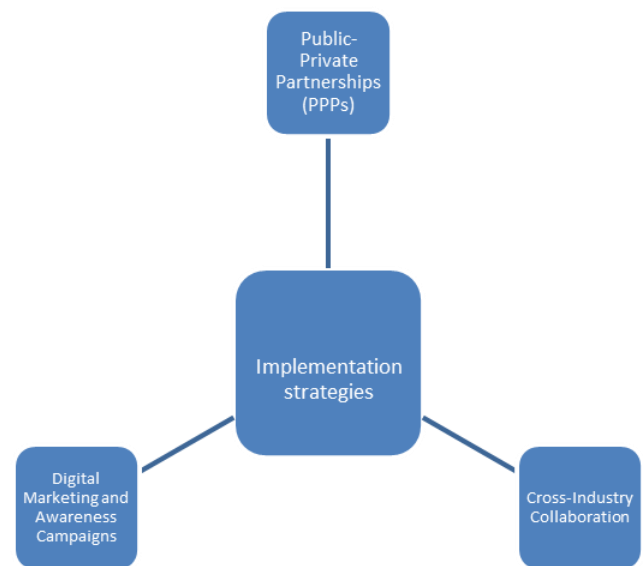


Fig 2: Three critical implementation strategies

Public-Private Partnerships (PPPs) are crucial for the development and sustainability of eSports. These collaborations leverage the strengths of governments, corporations, and non-governmental organizations (NGOs) to create an enabling environment for the industry (Ajonbadi *et al.*, 2015; Onukwulu *et al.*, 2022) ^[4]. Governments play a key role in regulatory oversight, policy formulation, and infrastructure development. By investing in digital infrastructure and providing tax incentives, governments can encourage private sector participation in the eSports ecosystem. Corporations contribute by providing financial

sponsorships, technological advancements, and strategic expertise. Major technology firms and gaming companies invest in research and development to enhance gaming platforms, improve hardware capabilities, and optimize online gaming experiences. Moreover, corporate sponsorship of tournaments and gaming events helps legitimize eSports as a professional industry. NGOs complement these efforts by advocating for inclusivity, fair play, and ethical gaming practices (Solomon *et al.*, 2017). They also facilitate community engagement by organizing grassroots initiatives and training programs to support aspiring eSports athletes. Through PPPs, the eSports industry can gain structured support, ensuring long-term viability and responsible growth. Digital marketing and awareness campaigns play a fundamental role in the global expansion of eSports, particularly in underrepresented regions (Alli and Dada, 2022) ^[1]. The use of social media platforms, influencer marketing, and targeted advertising strategies enhances the visibility of eSports among diverse audiences. Social media platforms such as Twitch, YouTube, and TikTok provide real-time engagement opportunities for eSports players, teams, and organizations (Otokiti *et al.*, 2016) ^[39]. Live-streaming matches, sharing behind-the-scenes content, and engaging with fans via interactive posts increase audience participation and attract new demographics. Influencer marketing is another critical tool for promoting eSports. Popular gamers and streamers with substantial followings can introduce eSports to new regions by showcasing local talent and collaborating with international brands. This approach fosters a sense of community and encourages participation from aspiring players. Furthermore, targeted advertising through data analytics ensures that eSports campaigns reach the right audience (Oludare *et al.*, 2022) ^[27]. Personalized marketing techniques, including geo-targeting and behavioral analysis, help tailor promotional efforts to specific cultural and economic contexts. By leveraging digital marketing strategies, eSports organizations can successfully penetrate new markets and drive regional engagement.

Cross-industry collaboration is essential for the holistic development of eSports. Integration with the education, entertainment, and technology sectors facilitates the industry's expansion while fostering skills development and innovation (Onukwulu *et al.*, 2021) ^[28]. In the education sector, eSports can be incorporated into curricula through specialized training programs, scholarships, and university leagues. Educational institutions can collaborate with gaming companies to offer courses on game design, eSports management, and digital marketing. This approach not only enhances career opportunities for students but also legitimizes eSports as an academic discipline. The entertainment industry also plays a significant role in the growth of eSports (Adekola *et al.*, 2023) ^[2]. By collaborating with film, music, and media industries, eSports events can be integrated into mainstream entertainment. Partnerships with streaming services, television networks, and film production companies help popularize eSports through documentaries, live broadcasts, and thematic storytelling. Finally, the technology sector drives innovation in eSports through advancements in artificial intelligence (AI), virtual reality (VR), and cloud gaming. Collaborations between eSports companies and tech firms lead to the development of cutting-edge gaming experiences, improved game analytics, and enhanced user engagement.

The successful implementation of eSports strategies requires a multifaceted approach involving Public-Private Partnerships, Digital Marketing, and Cross-Industry Collaboration. By leveraging governmental support,

corporate investment, digital outreach, and interdisciplinary cooperation, the eSports industry can achieve sustainable growth and global recognition (Onukwulu *et al.*, 2023) ^[34]. These strategies not only enhance industry development but also foster economic opportunities and cultural integration in emerging markets.

2.4 Case studies and benchmarking

Examining case studies from emerging eSports markets and comparing them with established regions provides valuable insights into best practices and strategies for fostering a sustainable eSports ecosystem (Onukwulu *et al.*, 2021) ^[28]. By benchmarking successful models, underrepresented regions can identify growth opportunities, adapt proven frameworks, and develop tailored solutions for their specific challenges.

Several emerging markets have successfully developed eSports ecosystems despite infrastructure and financial constraints. Southeast Asia, South America, and Africa have demonstrated innovative approaches to eSports growth, offering valuable lessons for other underrepresented regions. Southeast Asia has become a rapidly growing eSports market, driven by strong government backing and the widespread adoption of mobile gaming. Countries like Indonesia, Thailand, and the Philippines have invested in infrastructure and digital policies that support eSports development. The rise of mobile games such as *Mobile Legends: Bang Bang* and *PUBG Mobile* has lowered entry barriers, allowing a broader audience to participate without expensive gaming hardware. Government recognition has played a significant role in legitimizing eSports. For example, the inclusion of eSports as a medal event in the 2019 Southeast Asian Games showcased the industry's growing acceptance. Additionally, partnerships between governments and private entities have facilitated investments in gaming arenas, training programs, and tournament organization.

South America, particularly Brazil and Argentina, has embraced eSports through grassroots initiatives and community engagement. Despite economic challenges, the region has seen a surge in professional teams and international tournament participation. The success of Brazilian teams in games such as *Counter-Strike: Global Offensive (CS:GO)* and *League of Legends* highlights the impact of community-driven development. Local leagues and tournaments have played a crucial role in nurturing talent. Organizations like the Brazilian Championship of *League of Legends (CBLOL)* have provided structured competitive platforms for aspiring players. Additionally, streaming platforms such as Twitch and YouTube have enabled content creators to build large audiences, attracting sponsorships and investments (Ajonbadi *et al.*, 2014) ^[6].

Africa's eSports industry is still in its early stages, but promising initiatives have emerged in countries like South Africa, Nigeria, and Egypt. Infrastructure development has been a major focus, with investments in gaming hubs, high-speed internet access, and competitive leagues. International collaborations have been instrumental in Africa's eSports growth. Partnerships with global gaming companies and tournament organizers have helped bridge the gap between local talent and international exposure. For instance, the African eSports Championship has provided a platform for African gamers to compete at a continental level (Otokiti *et al.*, 2021) ^[7]. Moreover, organizations like NODWIN Gaming Africa have worked on fostering professional leagues and talent development programs.

Established eSports markets, such as North America, Europe, and South Korea, offer a benchmark for emerging regions.

These markets have developed robust ecosystems through strategic investments, regulatory frameworks, and strong commercial partnerships. The North American eSports industry has thrived due to significant corporate investments and the adoption of franchise-based league systems. The Overwatch League (OWL) and Call of Duty League (CDL) operate on franchise models, attracting major investors and sports organizations. Sponsorships from companies like Coca-Cola, Intel, and Red Bull have further strengthened the financial sustainability of the industry. A key takeaway for emerging markets is the importance of securing long-term investments through structured league systems (Amos *et al.*, 2014) ^[12]. Franchise models ensure revenue stability and encourage professionalization within the industry.

Europe has successfully integrated eSports into academic institutions, with universities offering eSports scholarships and degree programs. Countries such as the United Kingdom, Germany, and Sweden have developed structured grassroots programs that transition players from amateur levels to professional leagues. This approach highlights the significance of structured pathways for talent development. Emerging markets can benefit from similar initiatives by collaborating with educational institutions and integrating eSports into formal education systems. South Korea remains the global leader in eSports, with an industry that benefits from strong government support and cultural acceptance. The Korean eSports Association (KeSPA) regulates the industry, ensuring fair competition and professional standards. Infrastructure investments, such as dedicated eSports stadiums and training centers, have further solidified South Korea's dominance (Otokiti *et al.*, 2012) ^[8]. A major lesson from South Korea is the importance of government recognition and policy support. Emerging markets should work towards gaining institutional backing to establish clear regulations, player protections, and industry incentives.

Benchmarking successful models from Southeast Asia, South America, and Africa reveals that government support, grassroots engagement, and financial investments are key to sustainable eSports development. Comparing these regions with established markets like North America, Europe, and South Korea provides a roadmap for best practices. Emerging regions can accelerate their eSports growth by adapting strategies such as franchise-based leagues, academic integration, and government-backed initiatives. By learning from these case studies, underrepresented regions can build sustainable eSports ecosystems that foster talent, drive economic opportunities, and compete on the global stage (Ogbeta *et al.*, 2021; Ibidunni *et al.*, 2022) ^[23].

2.5 Future challenges and opportunities

The global expansion of eSports presents significant opportunities for economic growth, community engagement, and digital transformation (Shittu, 2023) ^[23]. However, underrepresented regions still face considerable challenges that must be addressed to foster sustainable development. Key areas of concern include overcoming digital divide and connectivity issues, ensuring financial sustainability, and leveraging emerging technologies such as artificial intelligence (AI), blockchain, and virtual reality (VR) to enhance accessibility.

A major challenge in emerging eSports markets is the lack of reliable digital infrastructure. High-speed internet access, stable electricity, and access to modern gaming equipment remain significant barriers, particularly in rural and low-income areas (Otokiti *et al.*, 2021; Akinbola *et al.*, 2022) ^[7]. The digital divide limits the participation of aspiring gamers, coaches, and content creators who lack the necessary

resources to compete on a global stage. To address this issue, governments and private stakeholders must invest in expanding internet infrastructure, particularly fiber-optic networks and 5G technology. High-speed, low-latency connections are essential for competitive online gaming, and public-private partnerships can help accelerate broadband deployment in underserved regions. In addition, mobile gaming presents an opportunity to bridge the gap, as smartphones are more accessible than gaming PCs or consoles (Ibidunni *et al.*, 2023) ^[17]. Titles such as Mobile Legends, PUBG Mobile, and Free Fire have demonstrated how mobile-first eSports ecosystems can thrive in regions with limited hardware access. Cloud gaming is another promising solution to connectivity challenges. Services such as NVIDIA GeForce Now and Google Stadia allow players to stream high-quality games without requiring high-end hardware. However, widespread adoption of cloud gaming in underrepresented regions requires further investment in cloud infrastructure and affordable data plans (Otokiti, 2017) ^[42]. Financial sustainability remains a crucial factor for the long-term success of eSports in emerging markets. Unlike North America, Europe, and South Korea, where established leagues attract large-scale corporate sponsorships, many developing regions struggle to secure consistent funding for leagues, training programs, and infrastructure development. To address this challenge, multiple financing strategies should be explored. governments and industry leaders should create favorable investment conditions for private sector involvement in eSports. Tax incentives, sponsorship deals, and venture capital initiatives can attract financial backing for leagues, gaming facilities, and talent development programs (Shonk and Weiner, 2021) ^[48]. Small-scale investments from the gaming community can support grassroots initiatives. Platforms like Patreon, Kickstarter, and esports-focused fundraising campaigns can help teams, streamers, and tournament organizers access funding without relying solely on corporate sponsors. The rise of streaming and digital content offers alternative revenue streams for eSports organizations. Platforms like Twitch, YouTube Gaming, and Facebook Gaming provide opportunities for players to generate income through ad revenue, sponsorships, and audience contributions. By diversifying financial strategies, emerging markets can ensure a more stable and sustainable eSports ecosystem.

Emerging technologies present exciting opportunities to enhance accessibility and improve the overall eSports experience. AI, blockchain, and VR can revolutionize talent development, game security, and audience engagement. AI-driven analytics can help players and coaches analyze gameplay patterns, optimize strategies, and improve performance. AI-powered matchmaking systems can create fairer competitive environments by ensuring balanced team compositions. Additionally, AI-based automated training programs can assist aspiring players in skill development. Blockchain offers secure and transparent financial transactions, which can help with prize distributions, sponsorship payments, and digital asset trading (Kumari and Devi, 2022) ^[18]. Non-fungible tokens (NFTs) and blockchain-based in-game economies enable players to own and trade digital assets, providing new revenue opportunities for gamers and organizations. Virtual reality (VR) technology can revolutionize the eSports experience by creating immersive gaming environments. VR-based tournaments can attract new audiences, and training simulations can help players refine their skills in a more engaging setting (Tsai *et al.*, 2021) ^[40]. However, the high cost of VR hardware remains a challenge, requiring further technological

advancements to lower entry barriers. By leveraging these emerging technologies, underrepresented regions can enhance their competitive edge and create innovative solutions to drive eSports growth. The future of eSports in underrepresented regions depends on overcoming digital infrastructure limitations, securing long-term financial sustainability, and integrating emerging technologies to enhance accessibility. While challenges such as the digital divide and funding constraints persist, innovative solutions, including cloud gaming, alternative financing models, and AI-driven analytics, can help bridge these gaps. By fostering strategic investments and embracing new technologies, developing eSports markets can unlock their full potential and establish themselves as key players in the global gaming industry (Cranmer *et al.*, 2021) ^[13].



Fig 3: Fundraising campaigns teams

3. Conclusion

This study highlights the rapid growth of eSports and its environmental, economic, and social implications. The key findings suggest that sustainable eSports development requires energy-efficient gaming infrastructures, responsible electronic waste management, and equitable opportunities for diverse participants. The study also emphasizes the role of regulatory frameworks and technological innovations in minimizing the environmental footprint of eSports while promoting inclusivity and fair competition.

To ensure sustainability in eSports, policymakers, industry leaders, and stakeholders should adopt the following strategies, developers and tournament organizers should integrate renewable energy sources and promote low-power hardware solutions. Governments should enforce recycling programs and responsible disposal policies for gaming equipment. Organizations must establish diversity and inclusion policies to foster equitable participation. Partnerships should prioritize environmentally responsible companies that align with sustainability goals. Research institutions and companies should collaborate on developing eco-friendly gaming solutions.

Further research is necessary to explore advanced methods for reducing the carbon footprint of eSports tournaments, particularly regarding cloud gaming and blockchain-based event management. Additionally, studies should investigate the long-term social impacts of eSports on mental health and career sustainability. Finally, interdisciplinary research combining artificial intelligence, behavioral psychology, and sustainability science can provide insights into optimizing eSports for environmental and social well-being. Achieving sustainable eSports development requires a collaborative

effort among policymakers, industry players, and researchers. By implementing responsible policies and advancing research, the eSports industry can evolve into a model of sustainability for digital entertainment.

4. Reference

- Adekola AD, Alli OI, Mbata AO, Ogbeta CP. Integrating multisectoral strategies for tobacco control: Evidence-based approaches and public health outcomes. *Int J Med All Body Health Res.* 2023;4(1):60-69. Available from: <https://doi.org/10.54660/IJMBHR.2024.4.1.60-69>.
- Adekola AD, Alli OI, Mbata AO, Ogbeta CP. Integrating multisectoral strategies for tobacco control: Evidence-based approaches and public health outcomes. *Int J Med All Body Health Res.* 2023;4(1):60-69. Available from: <https://doi.org/10.54660/IJMBHR.2024.4.1.60-69>.
- Agho G, Ezech MO, Isong M, Iwe D, Oluseyi KA. Sustainable pore pressure prediction and its impact on geo-mechanical modelling for enhanced drilling operations. *World J Adv Res Rev.* 2021;12(1):540-557.
- Ajonbadi HA, Aboaba MS, Otokiti BO. Sustaining competitive advantage in medium-sized enterprises (SMEs) through employee social interaction and helping behaviors. *J Small Bus Entrep.* 2015;3(2):1-16.
- Ajonbadi HA, Otokiti BO, Adebayo. The efficacy of planning on organizational performance in the Nigeria SMEs. *Eur J Bus Manag.* 2016;24(3):25-47.
- Ajonbadi HA, Lawal AA, Badmus DA, Otokiti BO. Financial control and organizational performance of the Nigerian small and medium enterprises (SMEs): A catalyst for economic growth. *Am J Bus Econ Manag.* 2014;2(2):135-143.
- Akinbola OA, Otokiti BO, Akinbola OS, Sanni SA. Nexus of born global entrepreneurship firms and economic development in Nigeria. *Ekonomicko-manazerske spektrum.* 2020;14(1):52-64.
- Akinbola OA, Otokiti BO. Effects of lease options as a source of finance on profitability performance of small and medium enterprises (SMEs) in Lagos State, Nigeria. *Int J Econ Dev Res Invest.* 2012;3(3):70-76.
- Alli OI, Dada SA. Cross-cultural tobacco dependency treatment: A robust review of models for tailored interventions in diverse healthcare contexts. *Int J Multidiscip Res Growth Eval.* 2023;4(6):1102-1108. Available from: <https://doi.org/10.54660/IJMRGE.2023.4.6.1102-1108>.
- Alli OI, Dada SA. Reducing maternal smoking through evidence-based interventions: Advances and emerging models in high-impact public health strategies. *Int J Multidiscip Res Growth Eval.* 2023;4(6):1095-1101. Available from: <https://doi.org/10.54660/IJMRGE.2023.4.6.1095-1101>.
- Alli OI, Dada SA. Pharmacist-led smoking cessation programs: A comprehensive review of effectiveness, implementation models, and future directions. *Int J Sci Technol Res Arch.* 2022;3(2):297-304. Available from: <https://doi.org/10.53771/ijstra.2022.3.2.0129>.
- Amos AO, Adegbuyi OA, Otokiti BO. Market-based capabilities and results: Inference for telecommunication service businesses in Nigeria. *Eur Sci J.* 2014;10(7):358-374.
- Cranmer EE, Han DID, van Gisbergen M, Jung T. Esports matrix: Structuring the esports research agenda. *Comput Hum Behav.* 2021;117:106671.
- Heidenreich H, Brandt C, Dickson G, Kurscheidt M. Esports associations and the pursuit of legitimacy: Evidence from Germany. *Front Sports Act Living.*

- 2022;4:869151.
15. Hoffman JL, Pauketat R, Varzeas KA, editors. *Understanding collegiate esports: A practitioner's guide to developing community and competition*. London: Taylor & Francis; 2022.
 16. Ibidunni AS, Ayeni AAW, Ogundana MO, Otokiti B, Mohalajeng L. Survival during times of disruptions: Rethinking strategies for enabling business viability in the developing economy. *Sustainability*. 2022;14(20):13549.
 17. Ibidunni AS, Ayeni AAW, Otokiti B. Investigating the adaptiveness of MSMEs during times of environmental disruption: Exploratory study of a capabilities-based insights from Nigeria. *J Innov Entrep Inform Econ*. 2023;10(1):45-59.
 18. Kumari A, Devi NC. The impact of fintech and blockchain technologies on banking and financial services. *Technol Innov Manag Rev*. 2022;12(1/2).
 19. Lawal AA, Ajonbadi HA, Otokiti BO. Strategic importance of the Nigerian small and medium enterprises (SMEs): Myth or reality. *Am J Bus Econ Manag*. 2014;2(4):94-104.
 20. Lawal AA, Ajonbadi HA, Otokiti BO. Leadership and organizational performance in the Nigeria small and medium enterprises (SMEs). *Am J Bus Econ Manag*. 2014;2(5):121-127.
 21. Lin S, Khan A. The concept of e-sports in digital era: A case study of China.
 22. Macedo TAR, Kurtz GA. Who hasn't dreamed of being a video game player? Coloniality, precariousness, and hope labor in Free Fire. *Contracampo—Braz J Commun*. 2021;40(3):1-22.
 23. Ogbeta CP, Mbata AO, Katas KU. Innovative strategies in community and clinical pharmacy leadership: Advances in healthcare accessibility, patient-centered care, and environmental stewardship. *Open Access Res J Sci Technol*. 2021;2(2):16-22. Available from: <https://doi.org/10.53022/oarjst.2021.2.2.0046>.
 24. Ogbeta CP, Mbata AO, Katas KU. Advances in expanding access to mental health and public health services: Integrated approaches to address underserved populations. *World J Adv Sci Technol*. 2022;2(2):58-65. Available from: <https://doi.org/10.53346/wjast.2022.2.2.0044>.
 25. Ogbeta CP, Mbata AO, Udemezie KK, Kassem RG. Advancements in pharmaceutical quality control and clinical research coordination: Bridging gaps in global healthcare standards. *IRE J*. 2023;7(3):678-688. Available from: <https://www.irejournals.com> [Accessed 9 Feb. 2025].
 26. Ogungbenle HN, Omowole BM. Chemical, functional and amino acid composition of periwinkle (*Tympanotonus fuscatus var radula*) meat. *International Journal of Pharmaceutical Sciences Review and Research*. 2012;13(2):128-32.
 27. Oludare JK, Adeyemi K, Otokiti B. Impact of knowledge management practices and performance of selected multinational manufacturing firms in South-Western Nigeria. *FULafia Journal for Entrepreneurial Development*. 2022;2(1):56-70.
 28. Onukwulu EC, Agho MO, Eyo-Udo NL. Framework for sustainable supply chain practices to reduce carbon footprint in energy. *Open Access Research Journal of Science and Technology*. 2021;1(2):12-34.
 29. Onukwulu EC, Agho MO, Eyo-Udo NL. Advances in green logistics integration for sustainability in energy supply chains. *World Journal of Advanced Science and Technology*. 2022;2(1):47-68.
 30. Onukwulu EC, Agho MO, Eyo-Udo NL. Circular economy models for sustainable resource management in energy supply chains. *World Journal of Advanced Science and Technology*. 2022;2(2):34-57.
 31. Onukwulu EC, Agho MO, Eyo-Udo NL. Decentralized energy supply chain networks using blockchain and IoT. *International Journal of Scholarly Research in Multidisciplinary Studies*. 2023;2(2):66-85.
 32. Onukwulu EC, Agho MO, Eyo-Udo NL. Developing a framework for predictive analytics in mitigating energy supply chain risks. *International Journal of Scholarly Research and Reviews*. 2023;2(2):135-55.
 33. Onukwulu EC, Agho MO, Eyo-Udo NL. Developing a framework for supply chain resilience in renewable energy operations. *Global Journal of Research in Science and Technology*. 2023;1(2):1-18.
 34. Onukwulu EC, Dienagha IN, Digitemie WN, Egbumokei PI. Blockchain for transparent and secure supply chain management in renewable energy. *International Journal of Science and Technology Research Archive*. 2022;3(1):251-72.
 35. Onukwulu EC, Dienagha IN, Digitemie WN, Egbumokei PI. AI-driven supply chain optimization for enhanced efficiency in the energy sector. *Magna Scientia Advanced Research and Reviews*. 2021;2(1):87-108.
 36. Otokiti BO, Igwe AN, Ewim CP, Ibeh AI, Sikhakhane-Nwokediegwu Z. A conceptual framework for financial control and performance management in Nigerian SMEs. *International Journal of Social Science Exceptional Research*. 2023;2(1):52-70.
 37. Otokiti BO, Igwe AN, Ewim CP, Ibeh AI, Sikhakhane-Nwokediegwu Z. A framework for developing resilient business models for Nigerian SMEs in response to economic disruptions. *International Journal of Multidisciplinary Research and Growth Evaluation*. 2022;3(1):647-59.
 38. Otokiti BO, Igwe AN, Ewim CP, Ibeh AI. Developing a framework for leveraging social media as a strategic tool for growth in Nigerian women entrepreneurs. *International Journal of Multidisciplinary Research and Growth Evaluation*. 2021;2(1):597-607.
 39. Otokiti BO. Management practices and organizational performance of selected multinational corporations in Nigeria [Doctoral Thesis]. Babcock University; 2016.
 40. Tsai WL, Su LW, Ko TY, Pan TY, Hu MC. Feasibility study on using AI and VR for decision-making training of basketball players. *IEEE Transactions on Learning Technologies*. 2021;14(6):754-62.
 41. Otokiti BO. Mode of entry of multinational corporations and their performance in the Nigeria market [Doctoral Dissertation]. Covenant University; 2012.
 42. Otokiti B. A study of management practices and organizational performance of selected MNCs in emerging markets - A case of Nigeria. *International Journal of Business and Management Invention*. 2017;6(6):1-7.
 43. Otokiti B. Social media and business growth of women entrepreneurs in Ilorin metropolis. *International Journal of Entrepreneurship, Business and Management*. 2017;1(2):50-65.
 44. Oyedokun OO. Green human resource management practices and its effect on the sustainable competitive edge in the Nigerian manufacturing industry (Dangote) [Doctoral dissertation]. Dublin Business School; 2019.
 45. Pizzo AD, Su Y, Scholz T, Baker BJ, Hamari J, Ndanga L. Esports scholarship review: Synthesis, contributions,

- and future research. *Journal of Sport Management*. 2022;36(3):228-39.
46. Shittu AK. The role of multi-cultural awareness in corporate leadership: A conceptual model for improving organizational effectiveness. *International Journal of Multidisciplinary Research and Growth Evaluation*. 2022;3(1):677-89. DOI: 10.54660/IJMRGE.2022.3.1-677-689.
 47. Shittu AK. Developing strategic roadmaps for data-driven organizations: A model for aligning projects with business goals. *International Journal of Social Science Exceptional Research*. 2023;2(1):71-83. DOI: 10.54660/IJSSER.2023.2.1.71-83.
 48. Shonk DJ, Weiner JF. Sales and revenue generation in sport business. *Human Kinetics*; 2021.
 49. Adebola SA, Akpa VO, Ilori BO. Human resource management practices and productivity - A case of selected multinational corporations in Nigeria. *International Journal of Business and Management Invention*. 2017;6(5):1-7.
 50. Yeung HWC. Explaining geographic shifts of chip making toward East Asia and market dynamics in semiconductor global production networks. *Economic Geography*. 2022;98(3):272-98.