

Research Article

# Internal Quality Control and the Role of Learning Management Systems (LMS) in Higher Education Institutions in Sierra Leone: Then, Now, and Later

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## Abstract

The paper explores the evolution of Internal Quality Control (IQC) in Sierra Leone's higher education institutions (HEIs) with a specific focus on the transformative role of Learning Management Systems (LMS). Beginning with the colonial era, the paper traces the historical context of IQC, emphasizing its informal nature. The post-independence expansion of HEIs introduced quality challenges compounded by economic constraints and political instability. The civil war further disrupted the education sector, and the reconstruction period saw the establishment of the Tertiary Education Commission (TEC), formalizing IQC processes. The introduction of LMS platforms, such as Moodle and Google Classroom, marked a pivotal shift in enhancing educational quality. LMS has significantly contributed to data-driven decision-making, standardized educational processes, and continuous feedback mechanisms. However, challenges remain, including infrastructural limitations and the urban-rural digital divide. The paper also projects the future of IQC, highlighting the potential integration of advanced technologies such as artificial intelligence, big data analytics, and blockchain in LMS platforms. These advancements promise to revolutionize the educational experience, offering new possibilities for quality assurance and student engagement.

## Keywords

Internal Quality Control, Learning Management Systems, Higher Education Institutions, Educational Quality Assurance

## 1. Introduction

Internal Quality Control (IQC) is a cornerstone in developing and maintaining academic standards in Sierra Leone's higher education institutions (HEIs) (Tertiary Education Commission, 2001). It encompasses systematic processes and policies designed to enhance the quality of education and improve teaching, learning, and administrative services within educational institutions. The methods for ensuring IQC in higher education have evolved in response to changing

circumstances, including technological advancements such as learning management systems (LMS) Njala University. (2022). [3].

Sierra Leone's HEIs have been shaped by IQC, especially considering the country's rich educational heritage, despite socio-economic challenges (Mansaray, A., & Bangura, T. (2019). [7]. Sierra Leone's higher education has transformed from the colonial era to the post-war period, affected by in-

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ternal and external triggers such as political instability, limited resources, and global education trends (Kamara, S., & Sesay, M. (2021). [8]. Despite these challenges, HEIs in Sierra Leone have shown resilience, integrating LMS into their quality assurance frameworks Fourah Bay College. (2023). [5].

The incorporation of LMS into IQC processes is a significant shift in how education is delivered and evaluated. LMS platforms provide better access to education and allow institutions to monitor, assess, and improve learning standards (Johnson, R., & Osei, P. (2020). [6]. Sierra Leone, with its growing technological infrastructure, faces both challenges and opportunities with LMS adoption Glover, D., & Mohamed, K. (2017). [12].

LMS can bridge educational gaps by ensuring equitable access to quality education for students in remote areas. However, limited technology and resources hinder LMS implementation in Sierra Leone's higher learning institutions (Jalloh, H., & Conteh, A. (2018). [10].

This paper discusses the historical development of IQC in Sierra Leonean HEIs, the current role of LMS in enhancing IQC, and future directions. By examining how IQC has evolved alongside LMS, this study provides perspectives on improving education quality in Sierra Leone within a rapidly evolving global educational environment World Bank. (2022). [2].

Historically, IQC in Sierra Leonean HEIs aimed at maintaining the prestige of institutions like Fourah Bay College, one of the oldest universities in West Africa Fourah Bay College. (2023). [5]. After independence, IQC became more formalized, particularly after the civil war disrupted the educational sector (Mansaray, A., & Bangura, T. (2019). [7]. In 2001, the establishment of the Tertiary Education Commission (TEC) transformed IQC into a formal system, overseeing accreditation and quality assurance for all HEIs in Sierra Leone (Tertiary Education Commission, 2001). However, limited resources and inadequate technological infrastructure have been persistent challenges (UNDP). (2021). [11].

The introduction of LMS in the early 2010s marked a paradigm shift in IQC for Sierra Leonean HEIs. Platforms such as Google Classroom and Moodle have enhanced education quality by providing data insights into student performance and standardizing educational processes Njala University. (2022). [3]. Yet, challenges like the urban-rural digital divide hinder full LMS implementation (Kamara, S., & Sesay, M. (2021). [8].

The future of IQC in Sierra Leonean HEIs will be shaped by the integration of cutting-edge technologies into LMS platforms and the expansion of online and blended learning models (World Economic Forum. (2020). [9]. Technologies like artificial intelligence (AI), big data analytics, and blockchain offer both opportunities and challenges for LMS platforms and IQC UNESCO. (2021). [4]. Sierra Leonean HEIs must adapt to these innovations to sustain academic excellence and development in higher education.

## 2. Historical Context: Internal Quality Control in Sierra Leonean HEIs

The historical context of Internal Quality Control (IQC) in Sierra Leonean higher education institutions (HEIs) is deeply intertwined with the country's colonial history, the post-independence educational expansion, and the devastating impacts of the civil war. Each period has left a distinct mark on the evolution of IQC processes, shaping how educational quality is perceived, maintained, and improved.

### 2.1. Early Developments: Colonial Legacy and the Foundations of Higher Education

Sierra Leone's higher education system is one of the oldest in West Africa, with the establishment of Fourah Bay College in 1827 as a significant milestone Fourah Bay College. (2023). [5]. Originally founded as a theological seminary to train clergy, Fourah Bay College gradually expanded its curriculum to include a range of academic disciplines. During this early period, the concept of Internal Quality Control (IQC) was largely informal and centered around maintaining the institution's prestige (Mansaray, A., & Bangura, T. (2019). [7]. The quality of education was implicitly tied to the reputation of Fourah Bay College, which was often regarded as the "Athens of Africa" due to its role in producing highly educated African elites (Johnson, R., & Osei, P. (2020). [6].

However, formalized processes for ensuring and improving educational quality were not a priority. The focus was on maintaining the institution's academic standards through traditional methods, such as rigorous entrance exams and the use of external examiners from British universities (TEC, 2001). [1]. These practices ensured that the education provided met the standards expected by the colonial administration and the British educational system World Bank. (2022). [2]. Despite these efforts, there was little emphasis on how structured IQC mechanisms are understood in contemporary terms Glover, D., & Mohamed, K. (2017). [12].

### 2.2. Post-Independence Era: Expansion and the Emergence of Quality Challenges

The attainment of independence in 1961 brought about significant changes in Sierra Leone's higher education sector. The new government prioritized expanding access to higher education as part of its broader nation-building efforts. This period saw the establishment of additional HEIs, including Njala University and the University of Sierra Leone, which aimed to cater to the growing demand for higher education.

However, this rapid expansion was not accompanied by a corresponding focus on maintaining and improving educational quality. The emphasis was on increasing enrollment and providing access to a broader population segment, often at the expense of rigorous IQC processes. During this period, the lack of a formalized IQC framework led to concerns about

declining academic standards and the quality of graduates produced by Sierra Leonean HEIs.

The country's economic challenges further exacerbated the situation, which limited the resources available for higher education. The government's focus on expanding access to education often resulted in underfunded institutions struggling to maintain their infrastructure, pay staff, and provide adequate educational resources. These challenges directly impacted the quality of education, as institutions were forced to operate with minimal support and oversight.

### 2.3. The Impact of the Civil War: Disruption and Reconstruction

The outbreak of civil war in 1991 marked one of the most challenging periods for Sierra Leone's higher education sector. The conflict, which lasted until 2002, had a devastating impact on the country's educational infrastructure. Many HEIs were either destroyed or severely damaged, and the academic community was dispersed as students, faculty, and staff fled the violence. Any semblance of IQC was effectively dismantled during this period, as the primary focus shifted to survival and basic humanitarian needs (Mansaray, A., & Bangura, T. (2019). [7].

The post-conflict period presented challenges and opportunities for reconstructing the higher education sector. With support from international organizations, the government embarked on a series of reforms to rebuild and revitalize HEIs. Establishing the Tertiary Education Commission (TEC) in 2001 was pivotal in re-establishing IQC processes. The TEC was mandated to oversee the accreditation of HEIs and ensure that they met minimum quality standards (TEC, 2001). [1].

Despite these efforts, the reconstruction of Sierra Leone's higher education sector was hampered by ongoing economic difficulties, a lack of qualified personnel, and the slow pace of rebuilding infrastructure. The TEC faced significant challenges in implementing its mandate, particularly regarding limited resources and a lack of robust technological infrastructure to support IQC processes World Bank. (2022). [2].

### 2.4. Post-Conflict Reforms and the Emergence of Formalized IQC Processes

In the years following the civil war, Sierra Leone's HEIs gradually re-established themselves, albeit with significant challenges. The post-conflict period saw several key reforms introduced to improve the quality of education and restore the credibility of Sierra Leonean HEIs. The TEC played a central role in these efforts by introducing accreditation processes, conducting institutional evaluations, and promoting faculty development programs (TEC, 2001). [1].

One of the key developments during this period was the increasing recognition of the importance of formalized IQC processes. HEIs began establishing internal quality assurance units responsible for monitoring and evaluating the quality of

education within their institutions. These units were tasked with conducting regular reviews of academic programs, assessing faculty performance, and ensuring institutional policies and practices aligned with national and international quality standards (Mansaray, A., & Bangura, T. (2019). [7].

However, implementing IQC processes during this period was challenging. Many institutions struggled with limited financial and human resources, which hindered their ability to implement and sustain IQC activities fully. The lack of a comprehensive technological infrastructure also posed significant barriers to monitoring and evaluating educational quality (Jalloh, H., & Conteh, A. (2018). [10].

## 3. The Role of Learning Management Systems (LMS) in IQC: The Current Landscape

Integrating Learning Management Systems (LMS) into the educational processes of Sierra Leonean HEIs represents a significant advancement in the Internal Quality Control (IQC) approach. LMS platforms offer a range of tools and features that enhance the ability of institutions to deliver high-quality education, monitor student performance, and facilitate continuous improvement. In the current landscape, LMS platforms have become integral to the functioning of HEIs, particularly in the context of Sierra Leone, where challenges such as limited infrastructure and the digital divide persist.

### 3.1. The Introduction of LMS in Sierra Leonean HEIs

The adoption of LMS platforms in Sierra Leonean HEIs began in the early 2010s, driven by the need to modernize educational delivery methods and improve access to learning resources. Institutions such as Njala University and the University of Sierra Leone were among the first to implement LMS platforms, recognizing their potential to enhance teaching and learning processes.

Initially, the introduction of LMS was met with enthusiasm, as these platforms provided a centralized system for managing course content, facilitating communication between students and faculty, and streamlining administrative processes. Moodle, an open-source LMS, became one of the most widely used platforms in Sierra Leonean HEIs due to its flexibility, ease of use, and cost-effectiveness. Other platforms, such as Google Classroom, were also adopted, particularly in institutions with limited technological resources.

Implementing LMS was seen as a way to address some of the critical challenges facing Sierra Leonean HEIs, including the need for greater access to educational resources, the standardization of educational processes, and the enhancement of student engagement. By providing a digital platform for course delivery, LMS offered a solution to the logistical challenges of delivering education in a country with signifi-

cant infrastructural limitations.

### 3.2. Enhancing IQC Through LMS: Key Contributions

The integration of LMS into Sierra Leonean HEIs has had a profound impact on the ability of these institutions to implement and sustain effective IQC processes. LMS platforms have introduced several key features that have enhanced the monitoring, assessment, and improvement of educational quality:

1. **Data-Driven Decision Making:** One of the most significant contributions of LMS to IQC is the ability to generate and analyze data on student performance, engagement, and feedback. LMS platforms provide detailed analytics that allow institutions to track student progress, identify patterns of success and failure, and make informed decisions about curriculum design, teaching methods, and resource allocation. For example, if data reveals a course with a high student dropout or failure rate, the institution can investigate the underlying causes and take corrective action. This data-driven approach enables a more targeted and practical approach to quality assurance, as decisions are based on empirical evidence rather than anecdotal observations (Johnson & Osei, 2020; Glover & Mohamed, 2017).
2. **Standardization of Educational Processes:** Before the widespread adoption of LMS, there was considerable variation in how courses were delivered, assessed, and graded across different departments and faculties within Sierra Leonean HEIs. This lack of standardization posed challenges for maintaining consistent educational quality and ensuring fairness in the evaluation process. LMS platforms have addressed this issue by providing a standardized course delivery and assessment framework. For example, LMS platforms allow for the creation of standardized templates for course syllabi, assignment submissions, and grading rubrics. This standardization ensures that all students receive a consistent educational experience, regardless of their program or department, which is crucial for maintaining high standards of academic quality (Jalloh, H., & Conteh, A. (2018). [10].
3. **Enhanced Student Engagement and Interaction:** Another significant contribution of LMS to IQC is enhancing student engagement and interaction. LMS platforms offer a range of interactive features, such as discussion forums, quizzes, multimedia content, and virtual classrooms, which encourage active participation from students. Increased engagement is directly linked to improved learning outcomes, as students are more likely to retain information and develop critical thinking skills when actively involved in the learning process. Additionally, LMS platforms facilitate communication between students and faculty, allowing for

real-time feedback and support. This interaction is essential for creating a dynamic and responsive learning environment, a key component of educational quality (Njala University, 2022; Mansaray & Bangura, 2019).

4. **Continuous Feedback and Improvement:** LMS platforms facilitate continuous feedback loops between students and faculty, essential for improving educational quality. Students can provide feedback on course content, teaching methods, and overall learning experience, while faculty can use this feedback to make real-time course adjustments. This continuous feedback process creates a culture of constant improvement, where the quality of education is constantly evaluated and enhanced. For example, if students consistently report difficulties with a particular concept or teaching method, faculty can modify their approach to better meet the needs of their students. This iterative feedback and improvement process is central to effective IQC, as it ensures that educational quality is constantly evolving in response to students' needs and the demands of the academic environment (Kamara & Sesay, 2021; Fourah Bay College, 2023).

### 3.3. Challenges in LMS Implementation: Navigating the Obstacles

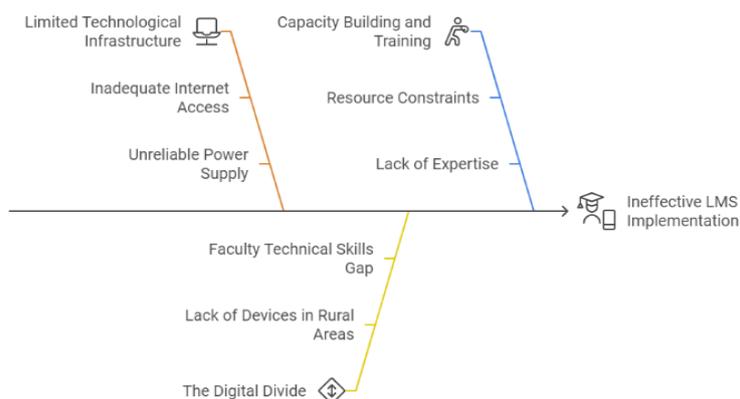
Despite the significant benefits of LMS for IQC, implementing these platforms in Sierra Leonean HEIs has not been without challenges. Several obstacles have hindered the full utilization of LMS and limited their impact on educational quality:

1. **Limited Technological Infrastructure:** One of the most significant challenges facing the implementation of LMS in Sierra Leonean HEIs is the limited technological infrastructure. Many institutions struggle with inadequate internet access, unreliable power supply, and a lack of computer facilities, which are essential for the effective use of LMS platforms. These infrastructural limitations not only affect the ability of students and faculty to access LMS resources but also hinder the overall integration of LMS into the educational processes of HEIs. For example, frequent power outages can disrupt online classes and prevent students from completing assignments on time, negatively impacting their academic performance and overall educational experience.
2. **The Digital Divide:** The digital divide between urban and rural areas in Sierra Leone is another significant challenge affecting LMS implementation. Students in remote regions often lack access to the necessary devices and internet connectivity to participate fully in online learning. This divide exacerbates educational inequalities, as students in rural areas are significantly disadvantaged compared to their peers in urban centres. The digital divide also challenges faculty, who may lack the

technical skills and resources to use LMS platforms effectively. Addressing this divide is crucial for ensuring that all students, regardless of location, access high-quality education through LMS.

3. Capacity Building and Training: Successful LMS implementation requires ongoing training and capacity building for faculty and students. However, many Sierra Leonean HEIs face challenges in providing adequate training due to resource constraints and a lack of expertise. As a result, LMS features are often underutilized,

limiting their potential impact on IQC. For example, faculty may use LMS platforms primarily for essential functions, such as uploading course materials, without fully leveraging the more advanced features, such as data analytics and interactive tools, that can significantly enhance educational quality. To address this issue, HEIs must invest in continuous professional development programs that equip faculty and students with the skills to use LMS platforms effectively.



**Figure 1.** Challenges in LMS Implementation in Sierra Leonean HEIs.

## 4. Future Prospects: The Role of LMS in IQC

The future of Internal Quality Control (IQC) in Sierra Leonean higher education institutions (HEIs) will be significantly influenced by the ongoing integration of Learning Management Systems (LMS) and other advanced technologies. As Sierra Leone's higher education sector continues to evolve, the role of LMS in enhancing IQC processes will become increasingly critical. This section explores the potential future developments in LMS integration, focusing on the incorporation of advanced technologies, the expansion of online and blended learning models, and the importance of addressing issues related to equity and inclusion.

### 4.1. Integration of Advanced Technologies: A New Frontier for IQC

Integrating advanced technologies into LMS platforms presents a new frontier for IQC in Sierra Leonean HEIs. Emerging technologies such as Artificial Intelligence (AI), Big Data analytics, and Blockchain have the potential to revolutionize the way educational quality is monitored, assessed, and improved.

1. Artificial Intelligence (AI): AI has the potential to significantly enhance LMS platforms by providing per-

sonalized learning experiences and automating administrative tasks. AI-driven analytics can offer deeper insights into student behavior, learning patterns, and performance, enabling institutions to identify at-risk students and provide targeted interventions. For example, AI algorithms can analyze data from multiple sources, such as attendance records, assignment submissions, and online activity, to predict which students risk falling behind. Institutions can then use this information to provide personalized support, such as tutoring or counselling, to help these students succeed. AI can also automate routine administrative tasks like grading and scheduling, freeing faculty time for more meaningful student interactions.

2. Big Data Analytics: The use of Big Data analytics in LMS platforms can enhance IQC by allowing institutions to analyze vast amounts of data on student performance, engagement, and satisfaction. By examining these data sets, institutions can identify trends, patterns, and areas for improvement. For example, Big Data analytics can reveal which courses have the highest dropout rates, which teaching methods are most effective, and which students are most engaged. This data-driven approach enables institutions to make more informed decisions about curriculum design, teaching methods, and resource allocation, leading to continuous improvement in educational quality.
3. Blockchain Technology: Blockchain technology offers a

secure and transparent way to manage academic records, ensuring the integrity of the educational process. By providing a tamper-proof system for storing and verifying academic credentials, Blockchain can enhance trust in the quality of education offered by Sierra Leonean HEIs. For example, Blockchain can create a decentralized ledger of educational records, where multiple parties securely encrypt and verify each record. This system not only prevents fraud and ensures the authenticity of academic credentials but also provides a transparent and auditable record of a student's educational journey.

Integrating these advanced technologies into LMS platforms will require significant investment in technological infrastructure and ongoing training and capacity building for faculty and students. However, the potential benefits for IQC are substantial, as these technologies can provide more accurate, efficient, and effective ways to monitor, assess, and improve educational quality.

#### 4.2. Expansion of Online and Blended Learning: Meeting the Needs of a Diverse Student Population

The COVID-19 pandemic has accelerated the adoption of online and blended learning models worldwide, and Sierra Leone is no exception. Expanding these learning modalities presents opportunities and challenges for IQC in Sierra Leonean HEIs.

1. **Online Learning:** The shift to online learning during the pandemic highlighted the potential of LMS platforms to deliver education remotely, providing greater flexibility and accessibility for students. Online learning allows students to access course materials, participate in discussions, and complete assignments from anywhere, at any time. This flexibility is particularly beneficial for students with work or family commitments that make it difficult to attend traditional face-to-face classes. However, the quality of online education must be carefully monitored to ensure that it meets the same standards as conventional face-to-face education. This requires the development of robust IQC frameworks specifically for online learning, including criteria for course design, delivery, assessment, and student support.
2. **Blended Learning Models:** Blended learning combines online and face-to-face instruction and offers a hybrid approach to enhance education quality by leveraging both modalities' strengths. For example, face-to-face instruction allows for direct interaction between students and faculty, facilitating deeper learning and engagement. Meanwhile, online instruction provides flexibility and access to more resources. However, integrating online and face-to-face components must be carefully managed to ensure students' seamless and cohesive learning experience. Institutions will need to develop IQC frame-

works that address the unique challenges of blended learning, such as ensuring consistency in course content, assessment methods, and student engagement across different modalities.

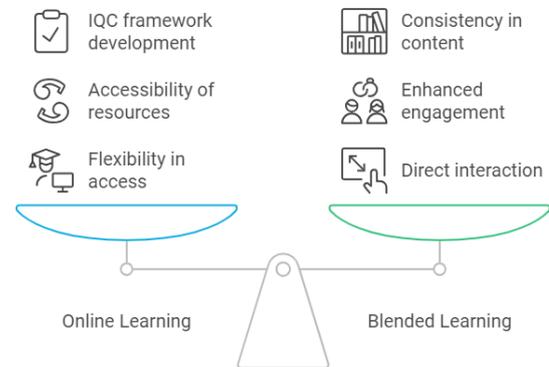


Figure 2. Evaluating online vs. blended learning in HEIs.

Expanding online and blended learning also presents opportunities for HEIs to reach a more diverse student population, including those in remote or underserved areas. However, this will require significant investment in technological infrastructure and support services to ensure all students have equal access to high-quality education.

#### 4.3. Strengthening IQC Frameworks: Adapting to a Changing Educational Landscape

As LMS platforms become more integrated into the educational processes of Sierra Leonean HEIs, there will be a need to strengthen and adapt existing IQC frameworks to accommodate the changes digital learning brings. This includes revising accreditation criteria, developing new assessment methods, and enhancing faculty development programs.

1. **Revising Accreditation Criteria:** Accreditation bodies such as the Tertiary Education Commission (TEC) must revise their criteria to include online and blended learning standards. This will ensure that all forms of education, whether delivered online or face-to-face, meet the same rigorous quality standards. For example, accreditation criteria could include requirements for online course design, student support services, data security, and student engagement and satisfaction benchmarks. These revised criteria will help ensure that online and blended learning programs are held to the same high standards as traditional face-to-face programs.
2. **Developing New Assessment Methods:** Traditional assessment methods, such as exams and written assignments, may not fully apply in an online learning environment. There is a need to develop new assessment strategies suited to digital education and maintaining academic integrity. For example, online assessments could include a mix of formative and summative evaluations,

such as quizzes, peer assessments, and e-portfolios, which provide a more holistic view of student learning. Additionally, institutions must implement measures to prevent academic dishonesty in online assessments, such as proctoring software and plagiarism detection tools.

3. **Enhancing Faculty Development Programs:** Continuous professional development for faculty is essential to ensure they are equipped to deliver high-quality education in a digital environment. This includes training on effectively using LMS platforms, designing and delivering online courses, and engaging and supporting students in a virtual classroom. Faculty development programs should also focus on helping instructors adapt their teaching methods to the online and blended learning modalities, ensuring that they can maintain high standards of educational quality regardless of the mode of delivery.

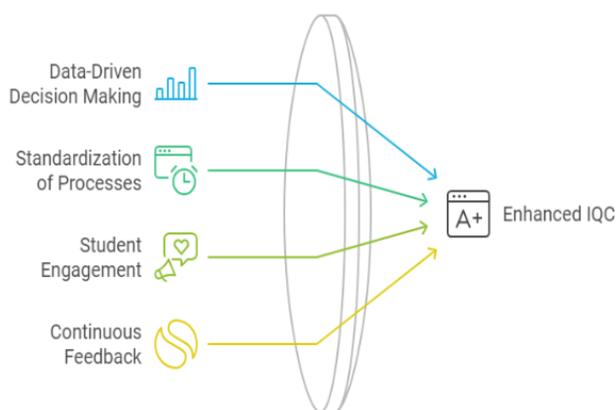


Figure 3. LMS Impact on IQC.

Strengthening IQC frameworks will require a collaborative effort from all stakeholders, including HEIs, accreditation bodies, government agencies, and international partners. By working together to develop and implement robust IQC frameworks, Sierra Leonean HEIs can ensure that they can deliver high-quality education that meets the needs of their students and the demands of the global educational landscape.

#### 4.4. Addressing Equity and Inclusion: Ensuring Access to Quality Education for All

As Sierra Leonean HEIs continue to adopt LMS platforms and expand online and blended learning models, it is essential to address issues of equity and inclusion in access to quality education. Ensuring that all students, regardless of their socio-economic background or geographic location, have access to high-quality education is a critical aspect of IQC.

1. **Bridging the Digital Divide:** One of the most significant challenges facing Sierra Leonean HEIs is the digital divide between urban and rural areas. Students in remote regions often lack access to the necessary devices and

internet connectivity to fully participate in online learning. Bridging this divide will require a concerted effort from both the government and HEIs to invest in expanding internet access and providing the necessary technological infrastructure to underserved areas. For example, the government could work with telecommunications companies to expand broadband coverage in rural areas. At the same time, HEIs could provide low-cost devices or internet subsidies to students who need them. Addressing the digital divide is essential for ensuring all students have equal access to high-quality education through LMS platforms.

2. **Supporting Disadvantaged Students:** In addition to addressing the digital divide, it is essential to provide targeted support to disadvantaged students who may face additional barriers to accessing quality education. This could include providing financial aid or scholarships to low-income students, offering flexible learning schedules to accommodate students with work or family commitments, and providing access to academic and mental health support services. By addressing the specific needs of disadvantaged students, HEIs can help ensure that all students have the opportunity to succeed, regardless of their socio-economic background.
3. **Promoting Inclusive Education:** Inclusive education is another crucial aspect of IQC, particularly in online and blended learning. This involves ensuring that LMS platforms and online courses are accessible to students with disabilities and that the educational environment is supportive and inclusive of all students. For example, online courses could be designed with accessibility features such as closed captioning, screen reader compatibility, and alternative formats for course materials. Additionally, faculty could be trained to create an inclusive and supportive online classroom environment where all students feel welcome and valued.

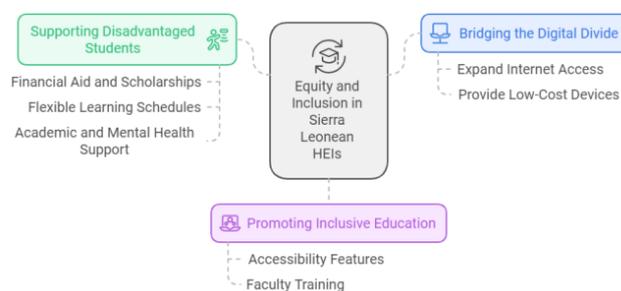


Figure 4. Equity and Inclusion in Sierra Leonean HEIs.

Addressing issues of equity and inclusion is not only a matter of social justice but also essential for ensuring education's overall quality and effectiveness. By ensuring that all students have access to high-quality education, Sierra Leonean HEIs can fulfil their mission of providing a transform-

ative and empowering educational experience for all.

## 5. Conclusion

The role of Internal Quality Control (IQC) in Sierra Leonean higher education institutions (HEIs) has been significantly transformed by the historical backdrop, the changing times of society and technological development. Initially, IQC efforts focused on preserving the prestige of institutions like Fourah Bay College, with minimal emphasis on formal quality assurance processes. Maintaining educational quality was complicated during the post-independence era and civil war period due to resource constraints and operational disruptions.

Formalized IQC processes began taking shape in this post-conflict period by establishing the Tertiary Education Commission (TEC) and introducing accreditation and evaluation mechanisms. These efforts marked a shift towards structured maintenance of educational standards among Sierra Leonean HEIs.

Adopting Learning Management Systems (LMSs) improved IQCs drastically by offering new tools for course delivery and student engagement and ensuring consistency in quality across institutions. LMS platforms also enable data-driven decision-making standardization for educational processes and facilitate continuous feedback and improvement. Nonetheless, challenges such as insufficient technological infrastructure and the digital divide have constrained the full realization.

Further, the future will see a convergence of artificial intelligence (AI), big data analytics and blockchain in the LMS platform, making IQC more personalized with intelligent learning machines, administration automation and the safety of academic data. As online and blended learning models become more ubiquitous, there's a great need for robust quality assurance frameworks that can handle unique challenges related to digital education.

All stakeholders, including HEIs, the government and international partners, must invest in infrastructure to ensure that all students have access to high-quality education regardless of their socio-economic backgrounds. Investing and working with Sierra Leonean Higher Education Institutions can further enhance their educational standards, leading to national development.

## Abbreviations

AI	Artificial Intelligence
HEIs	Higher Education Institutions
IQC	Internal Quality Control
LMS	Learning Management Systems
TEC	Tertiary Education Commission
ICT	Information and Communication Technology
QA	Quality Assurance
EQA	External Quality Assurance

## Author Contributions

**Gibrill Amid Sesay:** Conceptualization, Validation, Formal analysis, Writing – review & editing

**Isaac Muckson Sesay:** Data curation, Investigation, Methodology, Visualization

## Conflicts of Interest

The authors declare no conflicts of interest.

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