

# Recent Developments in Statistics and Data Science Education in Africa and the Roles of IASE

## Introduction

In recent years, Africa has witnessed a transformative shift in its approach to statistics and data science education. As the world increasingly relies on data-driven decision-making, the continent has recognized the pivotal role of these fields in driving innovation, addressing societal challenges, and fostering economic growth. In response to this growing demand for skilled professionals adept in statistical analysis and data science, a wave of developments has emerged across academia, industry, and collaborative sectors in Africa. Universities and educational institutions have embraced this momentum, introducing specialized programs and courses tailored to equip students with practical skills in statistical methodologies, predictive modeling, and data analysis. These initiatives not only focus on theoretical foundations but also emphasize hands-on experience with cutting-edge tools and technologies.

## Recent Developments

In recent years, there has been a noticeable surge in efforts to enhance statistics and data science education in Africa, driven by the increasing demand for data-driven decision-making across various sectors. Overall, there's a concerted effort to bridge the skills gap in statistics and data science in Africa, leveraging both traditional academic approaches and innovative, collaborative initiatives to meet the increasing demand for skilled professionals in these fields. Some recent developments in statistics and data science education in Africa include:

- 1. New Academic Programs:** Several universities and educational institutions in Africa have introduced specialized programs in statistics, data science, and related fields. These programs aim to equip students with practical skills in data analysis, machine learning, and statistical methodologies. (see the following links for some examples: <https://datalab.com.ng/universities-offering-data-science-in-nigeria/>, <https://aceds.ur.ac.rw/>, <https://globalscholarships.com/best-universities-data-science-africa/> )
- 2. New Partnerships and Collaborations:** Partnerships between African universities, international institutions, and industry players have been formed to enhance the quality of statistics and data science education in recent times. Collaborations often involve curriculum development, faculty training, capacity building, and access to resources like data sets and new technologies (A typical example is the LISA 2020 Global Network's partnership with several institutions in Africa to build statistics and data science capacity in Africa (<https://www.lisa2020.org/>)).
- 3. Remote (online) Learning Opportunities:** The rise of online education has provided opportunities for Africans to access quality statistics and data science courses from renowned international online institutions. Platforms like Coursera, edX, ADA Global Academy and DataCamp offer courses in these fields, often with financial aid options, and many Africans have benefited from these brands of online learning in recent times. The use of remote learning technologies has expanded access to education in statistics and data science, especially in remote or underserved areas. Online resources, webinars, and virtual classrooms have become more prevalent.

**4. New Government Initiatives:** Some African governments have recognized the importance of data literacy and have launched initiatives to promote statistics and data science education. These initiatives often focus on providing resources, training, and support for educators and students. Governments are investing in educational programs focused on data science and statistics at various levels, from primary to tertiary education. Initiatives include curriculum reforms, the establishment of data science centers (e.g., <https://aims-cameroon.org/home/#>), and scholarships to encourage students to pursue studies in these fields.

**5. Industry Engagement and Internships:** Collaboration between academia and industry is growing in Africa, leading to internship programs and real-world projects for African students. This collaboration helps students gain practical experience and industry-relevant skills.

**6. Research and Innovation:** There's a growing emphasis on research in statistics and data science across Africa, leading to innovative approaches tailored to address regional challenges and opportunities.

**7. Professional Development and Certification Programs:** Efforts to establish certification programs and professional development opportunities in data science and statistics are gaining traction in Africa. These certifications aim to validate skills and expertise in the field. Various short-term, intensive training programs like bootcamps and workshops have emerged to provide hands-on experience and practical skills to many African professionals seeking to transition into data science roles. Data-centric competitions, hackathons, and challenges are being organized, fostering a culture of innovation and problem-solving among students and professionals. These events encourage hands-on learning and collaboration to improve the skills of many youths in the continent.

**8. Local Community Initiatives:** Grassroots movements, meetups, and community-driven events focused on data science and statistics have emerged. These initiatives provide a platform for networking, knowledge sharing, and skill development among enthusiasts and professionals.

**9. Focused Research Centers and Institutes:** Some institutions across Africa have established specialized research centers and institutes dedicated to statistics, data science, and related fields. These centers serve as hubs for cutting-edge research, collaboration, and knowledge dissemination. An example of such a center is the African Institute for Mathematical Sciences (AIMS), which is presently spread across six countries in Africa.

**10. New Emphasis on Open Data Ethics and Governance:** With the increasing importance of ethical data handling, there's a growing focus on incorporating ethics and governance aspects into statistics and data science education. Courses and modules on data ethics help students understand responsible data practices. Some governments and organizations are promoting open data initiatives, making datasets accessible to students and researchers. This availability of data encourages practical learning and experimentation.

**11. Customized Programs for Specific Sectors:** Tailored statistics programs catering to the needs of various industries such as healthcare, agriculture, finance, and governance have been developed in some African institutions. These specialized programs aim to produce data professionals with domain-specific expertise.

**12. Capacity Building and Training Programs:** International organizations, NGOs, and foundations are investing in capacity-building programs to train educators and professionals in statistics and data science. These programs aim to improve teaching methodologies and enhance skills. The LISA 2020 Global Network ([www.lisa2020.org](http://www.lisa2020.org)) is doing much in this regard.

### **Potential Roles of IASE**

The International Association for Statistical Education (IASE) plays a significant role in shaping statistics education worldwide, including in Africa. Here are some potential roles that IASE could have in further developing statistics education in Africa:

#### **1. Advocacy and Collaboration:**

IASE can advocate for the importance of statistics education in Africa and encourage collaboration between international statistical organizations, local educational institutions, governments, and non-governmental organizations. Collaboration can help in sharing resources, expertise, and best practices to enhance statistics education across the continent.

#### **2. Curriculum Development:**

IASE can contribute to the development of tailored statistics curricula suitable for African educational systems. This might involve designing curricular frameworks, creating teaching materials, and recommending pedagogical approaches that are culturally relevant and aligned with the needs of African students.

#### **3. Teacher Training and Professional Development:**

Offering workshops, training programs, and professional development opportunities for statistics educators in Africa can improve the quality of teaching. These initiatives could focus on enhancing statistical knowledge, teaching methodologies, and the use of technology in statistics education.

#### **4. Research and Resources:**

Promoting research in statistics education specific to Africa can lead to the creation of valuable resources, such as case studies, datasets, and teaching aids that reflect African contexts. Encouraging the publication of research findings can also contribute to the dissemination of effective teaching practices.

#### **5. Outreach and Awareness:**

IASE can participate in outreach programs and campaigns to raise awareness about the importance of statistical literacy and its applications in various fields, including agriculture, healthcare, economics, and governance. This could involve engaging with policymakers, educators, students, and the public.

## **6. Technology Integration:**

Encouraging the integration of technology into statistics education can enhance learning experiences. IASE can support the development and adoption of statistical software, online resources, and interactive tools that facilitate learning and analysis.

## **7. Regional and Local Initiatives:**

Facilitating regional or country-specific initiatives tailored to the unique needs and challenges of different African regions can be effective. Supporting local statistical associations and educational institutions in organizing workshops, conferences, and networking events can foster collaboration and capacity building.

## **8. Evaluation and Assessment:**

Assisting in the development of appropriate assessment tools and methods to evaluate the effectiveness of statistics education programs in Africa can help in continuously improving teaching methodologies and learning outcomes.

By engaging in these activities, IASE can contribute significantly to the advancement of statistics education in Africa, empowering individuals with statistical literacy and skills crucial for informed decision-making and societal development.

## **Conclusion**

Although the list is not exhaustive, these developments collectively contribute to a more robust ecosystem for statistics and data science education in Africa, aiming to address skill gaps, foster innovation, and empower individuals and organizations with data-driven solutions. Incubators and accelerators focusing on data-driven startups are emerging, providing support, mentorship, and resources to aspiring entrepreneurs in the data space. Moreover, partnerships between African institutions, international organizations, and industry stakeholders have bolstered the quality of education. Collaborations involve curriculum enhancements, faculty training, and the provision of resources to create a more robust learning environment. The rise of online platforms has further democratized access to education, allowing individuals across Africa to enroll in specialized courses offered by renowned international institutions. Additionally, local initiatives, such as data science communities, workshops, and hackathons, have flourished, nurturing a culture of collaboration, innovation, and skill development. Furthermore, governments and organizations have recognized the importance of data ethics, governance, and domain-specific expertise, leading to the integration of these aspects into educational curricula. These multifaceted developments collectively signify a paradigm shift in statistics and data science education in Africa. They aim not only to bridge the skills gap but also to empower individuals with the expertise needed to harness the power of data for positive change across various sectors in Africa. The floor is open for major global stakeholders to contribute to the burgeoning improvement of statistics and data science education in Africa.

**Olushina Olawale Awe**, PhD (VP, IASE)