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STATISTICAL AND DATA LITERACY AND NATIONAL STATISTICAL OFFICES

A guidance note

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Global Network of Institutions
for Statistical Training (GIST)



A Guidance note for National Statistical Offices on Statistical and Data Literacy

1. Introduction

Statistical literacy refers to the ability of individuals to understand and interpret statistical data and concepts, enabling informed decision-making and critical evaluation of information (Sharma, 2017). There are other similar concepts involved, such as data literacy or information literacy (Schield, 2004), whose definitions requires the ability to manipulate datasets with the goal of performing data analysis (data literacy) or recognize when information is needed and the ability to locate, evaluate, and use it effectively (information literacy).

As the demand for data-driven decision-making grows, National Statistical Offices (NSOs) continue to adapt and expand their efforts to enhance statistical literacy among diverse audiences, thereby fulfilling their role as key providers and educators in the field of statistics. More recently, managing Artificial Intelligence (AI) tools became an important educational asset in everyday life. While statistical literacy emphasizes understanding, interpreting, and critically assessing quantitative information, and data literacy broadens this scope to include collecting, managing, and communicating insights from diverse data sources, we can consider also AI literacy to add the ability to understand how algorithms learn from data, make predictions, and influence decision-making. Together, these literacies foster not only the technical skills to interact with complex systems but also the critical and ethical awareness needed to evaluate their societal impact. This note provides an overview of Statistical and Data Literacy initiatives to enable NSOs to have a clearer understanding on what they need to do and why it is important. While specific mission statements of NSOs may vary, promoting Statistical Literacy aligns with broader missions related to producing reliable and timely statistical information, supporting evidence-based policymaking, and fostering public trust in official statistics.



One of the most important tasks for NSO is to rewrite the dissemination materials in a language that is easily assimilated by the educational communities. For example, imagine that the inflation rate last month was 5%. What does that mean? The inflation rate is the rate of change of an index. And this index is constructed from a limited set of prices for goods and services. Inflation can be measured in monthly or yearly terms. Explaining these terms is not easy. So, an inflation rate of 5% over the last month means that, on average, the prices of goods and services in the economy have increased by 5% compared to the previous month.

In the following we will describe this and other important tasks for NSOs to promote Statistical and Data Literacy. Identifying the target core audiences, rewriting or adapting materials, training and finding the right partners for Statistical Literacy initiatives are important tasks of NSOs in the developing such initiatives.

2. Statistical literacy and the role of National Statistical Offices (NSO)

National Statistical Offices (NSOs) play a crucial role in promoting Statistical Literacy within their respective countries. While promoting Statistical Literacy may not always be explicitly stated in every NSO's mission statement, it is increasingly recognized as an essential component of their broader goals. Therefore, it is very important that NSOs contribute to promoting Statistical Literacy, namely in Dissemination, Education and training, Campaigns, Development of resources for Schools, etc.

Some of the most important tasks that NSOs can develop to promoting Statistical Literacy are described in the following:



2.1. Data Dissemination

NSOs are responsible for collecting, compiling, and disseminating official statistics. They provide **access to a wide range of data** on demographics, economics, social issues, and more. By making **data easily accessible** through publications, reports, databases, and online portals, NSOs empower **individuals and organizations** to access and use statistical information effectively.



2.2. Education and Training

Many NSOs conduct educational programs, workshops, and training sessions aimed at enhancing statistical literacy among various stakeholders, including policymakers, researchers, educators, young students, and the general public. These initiatives often focus on improving skills in data interpretation, understanding statistical methodologies, and promoting critical thinking about data.



2.3. Public Awareness Campaigns

It is important that NSO develop tailored statistical resources, explaining statistical concepts in accessible language, and demonstrating practical applications of statistics in different domains.



2.4. Collaboration and Partnerships

NSOs collaborate with other government agencies, academic institutions, international organizations, and civil society to enhance statistical literacy initiatives. Partnerships often involve joint research projects, knowledge sharing, and capacity-building efforts to improve statistical skills and understanding globally.

3. Core Target Audiences

The core target audiences for National Statistical Offices (NSOs) in promoting statistical literacy are diverse and include various stakeholders who **use, interpret, or benefit from statistical data**. These audiences can be categorized as follows:

3.1. Policymakers and Government Officials. They rely on accurate and timely statistics to formulate, implement, and evaluate public policies and programs. Statistical literacy enables them to make informed decisions based on evidence.



3.2. Researchers and Academics use statistical data for scholarly analysis, hypothesis testing, and developing new theories. Statistical literacy is crucial for conducting rigorous and credible research.



3.3. Media and Journalists, since the media plays a key role in disseminating statistical information to the public. Journalists need statistical literacy to accurately interpret and report on data, helping to inform and educate the public on critical issues.



3.4. Business and Industry Leaders, since businesses use statistics for market research, economic forecasting, and strategic planning. Statistical literacy helps them to interpret market trends, consumer behavior, and economic indicators effectively.



3.5. Educators and Students; educators use statistics in teaching a variety of subjects, from mathematics to social sciences. Building statistical literacy among students is important for developing their analytical skills and preparing them for data-driven environments in their future careers.



3.6. Civil Society and Non-Governmental Organizations (NGOs): Civil society organizations use statistical data to monitor and evaluate social issues, advocate for policy changes, and track progress on development goals. Statistical literacy allows them to effectively use data in their campaigns and reports.



3.7. The General Public, such as ordinary citizens and consumers use statistical information in daily life, such as understanding economic reports, health statistics, or demographic trends. Promoting statistical literacy helps individuals make informed decisions and critically assess information presented in the media or by government agencies. Indeed, the different types of users of statistical data have varied needs based on their roles, expertise, and the contexts in which they operate. National Statistical Offices (NSOs) can tailor their efforts in promoting statistical literacy to meet these specific needs.



Table 1 contains a breakdown of the needs of different user groups and how NSOs can help.

Target Audience	Specific Needs	NSO Support for Statistical Literacy	Examples of Materials Provided
Policymakers and Government Officials	- Clear and actionable data - Timely data - Interpretation support	- Customized reports and dashboards - Data visualization - Training workshops on data interpretation and application	- Policy briefs - Interactive dashboards - Executive summaries - Scenario analysis reports
Researchers and Academics	- Access to detailed data - Methodological transparency - Advanced analytical tools	- Data portals with access to microdata - Methodological guides and papers - Collaborative research and data sharing initiatives	- Microdata sets - Methodology papers - Data documentation and codebooks - Research collaboration proposals
Media and Journalists	- Accurate and reliable data - Contextual information - Quick access	- Press releases and fact sheets - Media briefings on key statistics - Ready-to-use infographics and visualizations	- Press kits - Fact sheets - Infographics - Quick guides to interpreting key statistics
Business and Industry Leaders	- Market data and economic indicators - Forecasts and projections - Comparative data	- Industry-specific reports and market analysis - Regular updates on key economic metrics - Consultations on data interpretation	- Industry analysis reports - Economic outlook reports - Benchmarking data - Sectoral trend reports
Educators and Students	- Educational resources - Practical examples - Introductory guidance	- Development of textbooks and online courses - Curated datasets and case studies - Outreach programs, including school visits and workshops	- Textbooks and teaching guides - Sample datasets for classroom use - Case study booklets - Online educational modules and quizzes
Civil Society and NGOs	- Social and demographic data - Monitoring and evaluation tools - Advocacy resources	- Thematic reports on key social issues - Training on data use for advocacy and evaluation - Collaborations on data-driven campaigns	- Thematic reports (e.g., on health, education, poverty) - Monitoring and evaluation toolkits - Data-driven advocacy guides - Social impact reports
The General Public	- Basic understanding of statistics - Access to general data - Transparency and trust	- Public education campaigns using social media and community events - Interactive online tools for data exploration - FAQs and glossaries for statistical terms and concepts	- Public info brochures - Interactive data visualizations - Glossaries and FAQs - Video explainers on statistical concepts
International Organizations	- Comparable data across countries - Development indicators - Technical support	- Adherence to international statistical standards - Contribution to global databases and reports - Capacity building and international collaborations	- Cross-country comparison reports - SDG progress reports - International methodology standards documents - Capacity-building workshop materials
Data Scientists and Analysts	- Large datasets for analysis - High-quality data - Detailed data documentation	- Open data initiatives and access to raw datasets - API access for automated data retrieval - Rigorous data cleaning and validation processes	- Raw data sets and APIs - Data dictionaries - Codebooks and metadata - Data quality and validation reports

Table 1 - How can NSO support for Statistical Literacy

4. Key Partners for Statistical Literacy Initiatives

National Statistical Offices (NSOs) often collaborate with a variety of key partners to run or support statistical literacy initiatives. These partners can provide expertise, resources, and platforms to enhance the reach and effectiveness of these programs. The section introduces the key partners who are traditionally running or supporting statistical literacy initiatives and their respective strengths/areas of expertise.

These partnerships are essential for scaling up statistical literacy initiatives and ensuring that they reach diverse audiences, from policymakers to the general public. By leveraging the expertise and resources of these partners, NSOs can more effectively promote the understanding and use of statistical data in society.

Government Agencies

- Ministries of Education collaborate on integrating statistical literacy into school curricula and adult education programs.
- Ministries of Planning/Economics: Work together to promote the use of statistics in policy development and public administration.
- Local Governments: Engage in community-level statistical literacy programs and data dissemination efforts.

Educational Institutions

- Universities and Research Institutes: Partner on research, curriculum development, and training programs that promote statistical literacy.
- Schools and Colleges, teachers' associations: Integrate statistical concepts into teaching materials and support teacher training on the use of statistical data.

International Organizations and NGO

- United Nations (UN) Agencies: Organizations like the UN Statistics Division (UNSD), UNESCO, and UNDP often collaborate with NSOs on capacity-building and statistical literacy initiatives.
- World Bank: Provides funding, technical support, and global platforms for promoting statistical literacy.
- OECD: Collaborates with NSOs on initiatives like the OECD Programme for International Student Assessment (PISA) to assess and promote statistical literacy globally.
- Non-Governmental Organizations (NGOs) and Civil Society: NGOs Focused on Education and Development may work with NSOs to create accessible statistical resources for the public and underserved communities.

Private Sector, Tech Companies, Foundations

- Collaborate on data visualization tools, open data initiatives, and digital platforms for data dissemination (e.g., Google, Microsoft).
- In addition, Philanthropic Organizations, and Foundations (e.g., Gates Foundation, Open Society Foundations) may help providing funding and strategic support for large-scale statistical literacy campaigns, particularly in developing countries.

5. What and How to do: Diagnostics

We now guide NSOs on how to do a diagnostic of their specific situation/conditions to best define their approach to statistical literacy/prior to the implementation of statistical literacy initiatives.

This diagnosis must consider both internal and external factors.

Diagnostics matrix:

Current state of play:	Projection for the future:
• Current statistical literacy initiatives against core target audiences • Needs assessment (target audience)	• Mandate for NSO (e.g., statistical literacy in NSDS/NSP or other internal documents)
Internal Diagnosis: Capabilities and Resources • Staff's level of statistical training. • Teaching and communication skills.	• Human capacities to enable the development of statistical literacy initiatives (internal NSO, in NSS and outside such as academia, regional level, etc.) Human Resources • Staff's level of statistical training. • Teaching and communication skills.

	Previous experience in literacy programs.
Internal Diagnosis: Capabilities and Resources	Financial resources to support the development of statistical literacy initiatives (with NSO, NSS or other partners, regional level)
Internal Diagnosis: Capabilities and Resources	Technological Resources - Availability of digital platforms for training. - Access to statistical software and visualization tools.
Internal Diagnosis: Capabilities and Resources Quality, accessibility, and comprehensibility of current statistical products.	Statistical Production - Quality, accessibility, and comprehensibility of statistical products. - Availability of materials adapted for non-specialized audiences.
Internal Diagnosis: Capabilities and Resources	Organizational Culture - Level of institutional commitment to statistical literacy. - Existence of an internal strategy or policy on the subject.
External Diagnosis: Environment and Audience	Target Audience Profile - Who do you want to educate? (students, journalists, public officials, general public). - Current level of statistical understanding among the public. - Most effective communication channels for each group.
External Diagnosis: Environment and Audience	Educational and Cultural Context - Inclusion of statistics in national education plans. - Social perception of the usefulness of data and statistics.
External Diagnosis: Environment and Audience	Strategic Alliances - Possibilities for collaboration with universities, media, NGOs, etc. - Previous experiences of joint work.
Key Indicators for Measuring the Starting Point	

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|---|--|
| <ul style="list-style-type: none"> • Percentage of the population that understands basic concepts such as mean, median, and margin of error. • Level of confidence in official data. • Frequency of use of statistics in the media and public discourse. | |
|---|--|

Expected Outcome of the Diagnosis

With this information, ONE will be able to:

- Define clear and measurable objectives.
- Design content tailored to each audience.
- Establish mechanisms for evaluating the impact of its programs.

6. Good practices in and repositories on statistical literacy initiatives

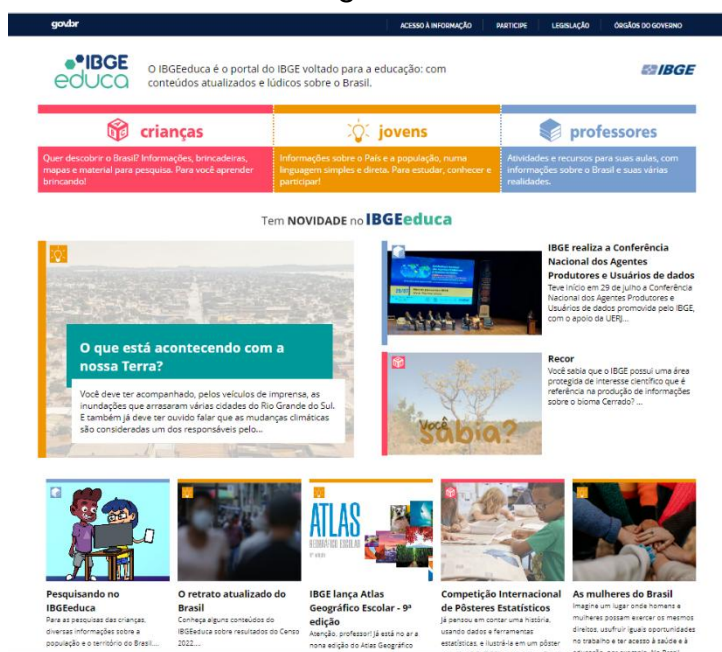
Some focus on younger people, namely primary and secondary school students. On the other hand, Data for Accountability, is the first project specifically aiming to strengthen the use of statistics in parliamentary oversight and representation in Ghana. Other examples include statistical training courses, like the ones offered by the Japanese government.

Some examples:

- Japan: There have been several online statistical training courses offered by the government to a wide range of data users on a major MOOC platform which has more than a million users. <https://gacco.org/stat-japan2/> (in Japanese language)
- Italy: In general Istat has developed a specific website session to become familiar with official statistics and Istat data and to “tell” statistical information in a simple way, using a friendly language. <https://www.istat.it/en/data-at-hand>
<https://www.istat.it/en/information-and-services/students-and-teachers>
- Mexico: Yes, INEGI is developing a statistical literacy program aimed at different users, with the target of build skills to analyze, understand and communicate statistical and geographic data for evidence-base decision making.

- Ghana: is currently running a project called Data for Accountability Project which has presented a platform to engage Members of Parliamentary sub-committees. As of today, we have programmes with three parliamentary sub-committees.
- Ghana: Through a UNDP sponsored programme we have collaborated with an academic institution to develop a curriculum for training media persons. Related to that, we have institutionalised a pre-release training for all major and technical releases.

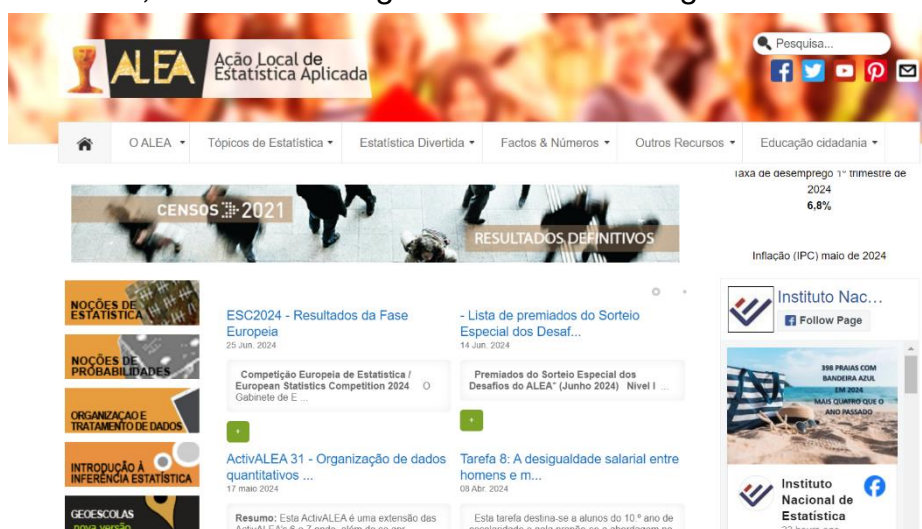
IBGE EDUCA – is the IBGE's (The Brazilian Statistical Office) education portal: with up-to-date and entertaining content about Brazil.



Developed by the Spanish Statistical Office, explica is the education portal, where you can find videos, presentations, tests, curiosities that will show you the activity and the Statistical science in a simpler way.



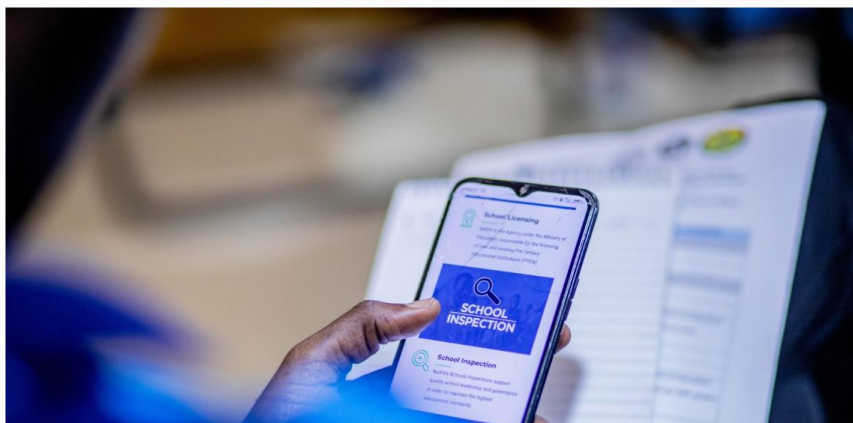
ALEA - Applied Statistics Local Action - is a Portuguese partnership project (between the Ministry of Education, ESTP - a Secondary School, and INE, the National Statistical Office), that aims to develop and make available tools to support the teaching and learning of statistics. Its main support is this website, although it also includes other initiatives, such as meetings/forums and training activities for teachers.



The Data for Accountability Project (DAP), led by the African Centre for Parliamentary Affairs, in partnership with the Ghana Statistical Service (GSS), the International Network for Advancing Science and Policy (INASP) and On Think Tanks (OTT) Consulting, is the first project specifically aiming to strengthen the use of statistics in parliamentary oversight and representation in Ghana.

Data for Accountability Project

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7. Customized recommendations from the example

This section will provide guidance on possible actions – in a non-prescriptive manner - based on the results of the diagnostics. Actions can be mapped to good practice examples (e.g., from statistical literacy inventory)

- Possibility versus responsibility to approach target groups
- Recommendation on regional initiatives
- Key elements in initiatives

Table 2. Element Description: Practical Examples

Element	Description	Practical Examples
User-Friendly Interface	Simple and intuitive website navigation and design	- Intuitive menus (e.g., "Data by Topic," "Publications") - Mobile-friendly design
Interactive Data Portals and Dashboards	Tools for exploring, visualizing, and customizing data	- Data Explorer Tools with filters - Economic Indicators Dashboard
Educational Resources and Tutorials	Materials for learning about statistics and data interpretation	- Online courses and webinars - Tutorial videos on statistical concepts
Glossaries and FAQs	Plain-language explanations of statistical terms and answers to common questions	- Searchable glossary of terms - FAQ section on data access and interpretation
Downloadable Datasets and Documentation	Access to raw data and detailed documentation on methodologies	- Open Data Section with downloadable datasets - Methodology papers and codebooks
Data Visualization Tools	Tools for creating and accessing visual representations of data	- Chart and Map Builders - Infographics Library
News and Updates Section	Regular updates on new data releases and reports	- Latest Releases section - Press Releases tailored for media
Publications and Reports Archive	Comprehensive access to all NSO publications and reports	- Searchable Archive of reports - Executive Summaries of key findings
Support and Helpdesk	Assistance for users in navigating the website and understanding data	- Live Chat Support - Contact Forms and Helpdesk
Collaborative and Community Features	Spaces for user interaction, discussion, and collaboration	- User Forums and Community Blogs - Partnerships and Data Collaborations
Case Studies and Success Stories	Real-world examples showcasing the impact of statistical data	- Case Study Library - Success Stories with interviews and testimonials
Multilingual Support	Availability of content in multiple languages	- Language options for website and resources - Localized content tailored to different regions
Open API Access	Tools and documentation for developers to integrate NSO data into applications	- API Documentation with example queries - Developer Tools for data integration

- Implement an institutional policy on statistical literacy and disseminate it throughout the National Statistical System.
- Implement a user-centered design (UX) and conduct usability testing with different user profiles.
- Create and implement an educational platform that offers courses such as tutorials and interactive glossaries in various formats like text, video, infographic, etc.
- Ensure transparency of data through the availability of methodologies, codes, and glossaries.

8. Evaluation of Statistical and Data Literacy Initiatives

Some issues are important to assess Statistical Literacy initiatives. These issues can be described in the form of questions.

Questions:

1. Do we see it as a roadmap towards more maturity or not?

Diagnostics -> Initiate statistical literacy actions -> Evaluate and consolidate statistical literacy initiatives -> Implement statistical literacy program

2. Do we bring it research and how/where?

Maybe for competencies for different target groups, methodologies, what else?

3. Do we want to propose an aide-memoire/template for the project document development?

A template with key components, matrices, etc.

4. Possible GIST + ISLP indicator
 - a. (possible) Methodology
 - i. Consider four categories, based on the target audience
 1. Secondary Schools
 2. University students
 3. Citizens (general public)
 4. Others
 - ii. For each category use a weighted measure based on:
 1. Quality of resources/Statistical concepts used
 2. Institutions involved/partnerships?
 3. National/ International outreach
 4. Currentness/future potential

Process evaluation based on the quality of the implementation of the initiative (number of participants, diversity of the audience, user satisfaction level, participation in collaborative spaces, etc.)

Outcome evaluation to measure whether participants have improved their understanding of statistical information and, as a result, developed the corresponding skills (pre- and post-assessments, ability to interpret information, changes in perception regarding the usefulness of statistics, practical application of the learned information, production of original content, etc.)

Impact evaluation aimed at measuring whether attitudes toward statistical information have changed because of literacy efforts (increased demand for statistical information from citizens, inclusion of statistical literacy in school curricula or public policies, creation of active data collaboration networks or user communities, etc.)

9. Action Plan

An action plan must be defined to help National Statistical Offices to develop and assess their own Statistical and Data Literacy initiatives. These could include (and not be limited to the following):

1. Organize webinars to showcase statistical literacy work of GIST and countries
2. Presentation of statistical literacy initiatives
2. Design statistical literacy content tailored to each audience or stakeholder group
3. Develop a timeline for implementing a statistical literacy program aimed at National Official Statistical Systems entities and different stakeholder groups.
4. Establish mechanisms for evaluating the impact of the literacy programs implemented
5. Based on the results obtained from the evaluations, establish actions for the continuous improvement of the implementation of the learned contents.
6. Promote the understanding of statistical information among citizens.
7. Encourage the production and use of citizen data in statistical production.

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