Inspirational approach towards the use of official statistics for sustainable development

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Abstract:

Statistical literacy can be considered essential when it comes to decision making even in day to day life of ordinary. Reliable, accurate and timely data is indispensable to promote decision making. As the national statistical agency of Sri Lanka, the goal of the Department of Census and Statistics (DCS) is to improve quality of official statistical products, disseminate them for various stakeholders who can use for evidence-based decisions making as well as researchers and academia for various studies. Total outcome of various statistical products is to make a better life for citizens. Therefore, reliable, accurate and timely data needs to promote decision making. DCS has taken steps to improve public interest on statistics through statistical awareness programs. DCS conducts seminars, training programs, and workshops for public officers, university students and journalists. Growing statistical knowledge and improved statistical literacy among general public is one of the long – term goals of DCS.

However, it is envisaged that if DCS can adopt a systematic approach to reach a broader audience that would be more sustainable. Students are the future users of statistics and they will be the respondents of future census and surveys which rely on the willing co-operation of citizens. By creating awareness among school children about official statistics, they will learn how and when to apply data and understand the importance of providing data. Teaching the fundamentals of statistics is what teachers do. The DCS intends to provide the resources to demonstrate how to analyse statistical information to be used in actual problems in real world and projects in the school setting. Proposed approach is to add a module on official statistical indicators and interpretations for school curricula, expecting that teachers will motivate students to understand statistical concepts and methods easily. By adding a new module about the introduction of official statistics to the syllabus of Civic Education will help students to develop the skills they need to succeed in the new knowledge-based economy, and benefit to our youth future citizens and entrepreneurs, and in the long term, our nation.

This paper discusses why it is important to explore the potential of new curricula to support teachers' and student's statistical literacy and discusses proposed strategies for the promotion of statistical literacy among students.

Keywords: Statistical literacy; Data quality; Sustainability

1. Introduction:

Data is the new oil for the modern dynamic economy: all over the world demand for statistics is growing rapidly. The globalized and interconnected world generates a wide range of information about human beings, representing their economic, social and environmental aspects. For decades, the national statistical offices (NSOs) and other producers of official statistics around the world have been providing reliable and high-quality data and information (UNECE,2018). The use of official statistics for evidence-based decision making has become crucial than ever, especially in a situation like COVID-19 pandemic. In this global pandemic, user's needs are becoming more complex and individualized, and more detailed information is needed, for instance, on small population groups and geographical localities (ILO,2020).

In the long-term, Sustainable Development Goals (SDGs) aim to ensure that all human beings can enjoy prosperous and fulfilling lives where economic, social, and technological progress occurs in harmony with nature (SDG report,2019). To achieve SDG goals as the nation and to become a responsible citizen capable of critical thinking and evidence-based judgment about social topics is desirable. Therefore, the ability to understand and to interpret the official statistics or information is required. To understand these statistics, citizens need specific statistical knowledge. Therefore, DCS has taken steps to improve statistical knowledge of data users, data producers as well as the general public through statistical awareness programs such as seminars, training programs, and workshops for higher-level decision makers, public and private sector data users, university students and journalists. Growing statistical knowledge and improved statistical literacy would lead to achieve long-term goals of DCS.

Statistical literacy means functional literacy, i.e. ability to review, interpret, analyses and evaluate written materials (Schield,2002). Anyone who lacks this type of literacy is functionally illiterate as a productive worker, an informed consumer or a responsible citizen. Therefore, enhancing statistical literacy is one of the objectives of the series of events carried out by the Department of Census and Statistics (DCS) as the key player of the National Statistical System. Statistical literacy is an extremely important skill to develop because in our daily life we are exposed to a wide range of statistical information, but an ordinary person might not be able to understand the actual meaning and get the advantage of statistics. For example, only a statistical literate person would be able to understand that falling inflation does not mean that prices are falling. It means that prices are increasing at a decreasing rate. Official statistics are generated using public money, and therefore, the general public has a fundamental right to get a correct understanding of data. Enhancing and expanding statistical literacy among the various target groups, NSO would be able to improve data quality by improving response rates of its census and surveys.

2. Background of Study:

Schoolchildren are the future citizen of the nation. Most of the good habits, community health, basic skills learn from school-age stretches typically throughout the whole life. Students receive messages by different activities, self-learning, experiencing or by reading. However, majority of them could easily grab new knowledge if it is interesting to life and it will last throughout life. Therefore, passing messages through students are faster, less expensive, good coverage and it's a long-term investment for the country.

According to the 2012 Census of Population and Housing, estimated child population (18 years and below) in Sri Lanka is around 30 percent i.e. 6,775,915 million in numbers, and out of this, 4,705,085 were school-aged child population (5 – 18 years). School Census conducted by the Ministry of Education (2018) reported that around 4,214,772 were studying in government schools in Sri Lanka. The table below describes, the distribution of student population by Provinces in Sri Lanka.

Table 1: Number of Government Schools, teachers and students, STR by Province -2018

Province	Number of Schools	Number of Students	Number of Teachers	Student-Teacher Ratio (STR)
Western	1,356	975,517	46,024	21.2
Central	1,517	556,924	35,641	15.6
Southern	1,110	538,628	30,601	17.6
Northern	987	238,631	18,158	13.1
Eastern	1,114	393,571	23,447	16.8
North Western	1,250	516,956	29,502	17.5
North Central	815	299,836	17,891	16.8
Uva	898	294,407	20,494	14.4
Sabaragamuwa	1,128	400,302	25,576	15.7
Sri Lanka	10,175	4,214,772	247,334	17.0

Source: Final Report, Annual School Census 2018, Ministry of Education

The Computer literacy survey (2019) conducted by the Department of Census and Statistics highlighted that highest digital literacy reported among 5-18 years school age population as 60.7 percent. Properly planned, methodical educational programs could be used to expand knowledge on various subjects. During this COVID 19 pandemic, majority of teachers and students use multiple modes of teaching and learning methods to advance their technical knowledge. It emphasized new knowledge on different aspects are required for the future generations. This era will be most suitable for various new modules on statistical concepts, knowledge and usage of official statistics for secondary level school-age population. Even though, present primary and secondary level school curriculum touches simple, basic statistical calculations, no proper way of teaching guidance has included in the current syllabus to understand commonly used statistical data. This knowledge gap of understanding statistics is the main reason for misinterpreting and misuse official data from time to time. Further, poor understanding of official data hurts and damage present data collection activities done by island-wide statistical investigators of the NSO. This present study revealed an Inspiration approach towards the use of official Statistics. Improving statistical literacy among school community is the main objective of this study. This could be achieved by addressing secondary level students and teachers.

3. Methodology:

This paper proposes a new module for teacher and student curricula in Civic subject to use official statistics for Sustainability. A country where Education considered as human resources investment tool for the human development it is essential to create valuable atmosphere for learning and teaching and facilities within the sphere of education. Modern Sri Lanka has possessed a self-directed education system which is a blend of global trends as well as ancient heritage. Civic Education has been made a compulsory subject for Grade 6-9 and, it is an optional subject in the 1st subject group for Grade 10-11. It is supposed to implement Assessment and evaluation for General Certificate of Education for Ordinary Level Examination based on the prescribed syllabus for Grade 10 -11

The main objectives of the chapters are to foster the acquisition and distribution of knowledge, skills and affective attributes concerning the national statistical system, official statistics and why they should learn it. At the beginning of each module it will be continuously, emphasized, official statistics are the statistics published by the government or other public bodies such as international organizations as a public good. Further, it should be powerful to plant the idea of official statistics makes for the wellbeing of the entire society. Students and teachers both finally would be able to understand quantitative or qualitative information of human life bridging the economic and social development of the country. They could see the value of official data and will be able to understand statistical interpretation often.

Even though there is a fundamental set of official statistics, official statistics are diverse. Policy planners of the country drive economic, social and environmental aspects of the country and data demand will be growing in future. With the growing data demands, many new products will be listed in future. Each module will have space to develop further.

a. Main components of the Teacher module

The module focuses on the in-service training of teachers and supervisors in Civic education for secondary schools. This module discussed four critical areas which need to be built as statistically literate.

i. Data awareness;
    What are Official statistics, Data sources, Mode of data collections, Mandate for Data Collection

ii. Statistical concepts;
    Basic forms of statistical representations, Different types of proportions, More complex statistical concepts

iii. The ability to analyse, interpret and evaluate statistical information;
    Organize data, construct and display graphs and tables and work with different representations of data including special data and data visualization tools

iv. The ability to communicate statistical information and understanding

b. Structure of the Student Modules

In each module, students should be aware of the various players in the national statistical system, functions of each player and available information with them. Before introducing complex statistical indicators, students' needs to understand the necessity of them. They may need practical examples or success/failure stories to understand the value of evidence-based decision making. In each module, students will learn the way of using timely, reliable and accurate information.

Table 2: Chapters of Each module proposed for each Grade

Chapter	Modules					
	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11
1	Introduction of data	Identify data sources	Sectors in Economy	Current official statistics Basics	Current official statistics Intermediate	Current official statistics Complex
2	Identify data needs of family	Collection of Primary and Secondary data	Data needs of the country	Introduction of the National Statistical System	Role of the National Statistical System and Users	Indicators and Calculations
3	Simple graphical ways of interpreting data	Mode of Data Collection	Biased Data	Basic forms of statistical representations	Proper interpretation of data	Spatial Data representation

4. Strategy:

One basic objective of the paper is to create awareness among school children about official statistics, as they will learn how and when to apply data and understand the importance of providing data. Students will be the future policy makers, they will be the future men and women driving the economy in the

country, doctors, engineers, bankers etc. Knowledge of statistics is essential in all these areas as well as in simple day to day decision making. Statistics bring stories and enable people to make sense of the world. Proposed inspirational approach and strategy for the promotion of statistical literacy among secondary student is storytelling. Storytelling is one of the most important genres in literature which reflects child's sensitivity, feed child's soul, enriches his/her imagination and prepares him/her for the future. Using an actual problem in real-world students are motivated to find the data sources, detail about the indicator and its standard interpretation.

5. Implementation:

The National Institute of Education (NIE) is the prime institute in the country which design and develop curricula for student and teacher education. It does modifications to the exiting curricula once in 8 years. Next changes will be done in 2023. The pilot test will be conducted before the introduction of the final module covering a sample of schools and ask the views of the teachers about the usefulness, clarity, and completeness of the course notes. After doing a pilot study just to see how good the module and having official authority from the Ministry of education and NIE, DCS would be able to introduce a module on official statistics to the secondary level teacher and student curricula.

6. Conclusion:

Aim of this study is to propose a new module for school curricula in order to improve statistical literacy. Investing public interest in statistics is like planting the seed of our ongoing relevance and viability as the national statistical organization. By adding a new module about the introduction of official statistics to the syllabus of Civic Education will help students to develop the skills they need to succeed in the novel knowledge-based economy. Furthermore, students are the future users of statistics, and they will be the respondents of future censuses and surveys. Improved statistical literacy will lead to engaging more users for official statistics and finally increase the reliability of DCS primary data by reducing the non-response rate of census and surveys conducted by the DCS.

References:

1. Atreya, B.D., Lahiry, D., Gill, J.S., Jangira, N.K., Guru, S. G. (1085). Environmental Education: Module for In-Service Training of Teachers and Supervisors for Primary Schools, National Council of Educational Research and Training (NCERT), New Delhi, India, UNESCO-UNEP International Environmental Education Programme.

2. Australian Bureau of Statistics (2013) 'Understanding statistics-why understanding statistics matters' (https://www.abs.gov.au)

3. Chakrabarty, K.C., (2012). Uses and Misuses of Statistics

4. DCS (2012). Census of Population and Housing, Final Report, Sri Lanka

5. DCS (2019). Computer Literacy Statistics – 2019 [Bulletin], Sri Lanka

6. Gal, I. (2003). Expanding Conception of Statistical Literacy: An Analysis of Products from Statistics Agencies

7. MOE (2018). Annual School Census of Sri Lanka, Final Report, Sri Lanka

8. Schield, M. (2013). Statistical Literacy: Thinking Critically about Statistics

9. Tishkovskaya, S., & Lancaste, G.A., (2010). Teaching Strategies to Promote Statistical Literacy: Review and Implementation

10. UNECE (2012). Making Data Meaningful – Part 4: A Guide to Improving Statistical Literacy. Geneva: United Nations.

11. UNECE (2018). Recommendations for Promoting, Measuring and Communicating the Value of Official Statistics. Geneva: United Nations