ISLP COUNTRY COORDINATORS AS AMBASSADORS OF STATISTICAL LITERACY AND INNOVATIONS

REIJA HELENIUS
Statistics Finland
reija.helenius@stat.fi

ADRIANA D'AMELIO
Universidad Nacional de Cuyo
estat06@hotmail.com

PEDRO CAMPOS
University of Porto and Statistics Portugal
pedro.campus@ine.pt

STEVE MACFEELY
UN Conference on Trade and Development and University College Cork
steve.macfeely@unctad.org

ABSTRACT

The International Statistical Literacy Project (ISLP) was established in 1994 by the International Statistical Institute and operates under the auspices of the International Association for Statistical Education. Today, the ISLP has 134 country coordinators spread across all continents of the world. The aim of this article is to describe and assess the activities of those country coordinators and discuss their contribution to advancing statistical literacy and that of ISLP. Some strategic issues for the ISLP executive are discussed, in particular, given the recent success of the ISLP in Latin America, and how this might inform future developments of the International Statistical Literacy Project.

Keywords: *Improving statistical literacy; International Statistical Literacy Project; Key success factors; ISLP country coordinators*

1. INTRODUCTION

The International Statistical Literacy Project (ISLP) is a project initiated by the International Statistical Institute (ISI) in 1994; it is now under the auspices of the International Association for Statistical Education (IASE), which is an educational association within the ISI. The mission of the ISLP is to support, create, and participate in statistical literacy activities and promote statistical literacy around the world. The project is run by a four-person executive team and supported by an advisory board with six members that are appointed by the IASE. The most important actors in the project are the 134 voluntary country coordinators who operate in 73 countries located in every continent (see Table 2). The project works in close cooperation with national statistical offices, statistical societies, universities, and statistical training institutes.

The purpose of the ISLP is to advance basic statistical literacy. It can be said there are two dimensions of statistical-literacy skills: basic skills and deeper competencies. In broad terms, this means the aim is to promote statistical literacy among the widest possible audience. It also

Statistics Education Research Journal, 19(1), 120–136, http://iase-web.org/Publications.php?p=SERJ

means advancing people's professional skills and social abilities. From an ISLP perspective, statistical literacy is a life skill required for today's information society. It is needed in planning, conducting, and understanding various surveys and reports, be they government-driven, run by the private sector, or communicated by the media. At a minimum, statistical literacy is an everyday skill for understanding news and media, and for making everyday decisions (see Table 1). There are several formal definitions of statistical literacy available (see Gal, 2002; Schield, 2010; Wallman, 1993). Generally, the old definition that literacy leads to development differs greatly from the new concept, which argues that literacy is rooted in social customs and has a social meaning. Social literacy implies training those who want to communicate something. When it comes to statistical literacy, data plays a more substantial role in what is communicated. In recent years, the ISLP has been concerned with responding to this broader concept of statistical literacy (UNESCO 2013) by encouraging students to engage in research issues that impact on their lives and on everyday situations.

Table 1. Dimensions of statistical literacy

Basic statistical literacy is a skill for people.	Deeper usage is a growing requirement for people acting in an information society.
Understanding of basic concepts and key figures.	Knowledge of concepts, figures, methods, and presentations.
Ability to use and understand numerical and statistical data in everyday situations.	Ability to use and produce numerical and statistical data in work and personal decision making.

Statistics involves tools and ideas that students can use in order to react intelligently to quantitative information in the world around them (Garfield, Ben-Zvi, Chance, Medina, Roseth, & Zieffler, 2008; Ben-Zvi, & Garfield, 2004). Statistics can also be used to create an engaging, informative, and compelling story (Nussbaumer Knaflic, 2015). There has been some discussion about the concepts of statistical literacy and whether it is in fact different from data literacy. Gould (2017) argues that statistical literacy is not far from (or can be the same as) data literacy since it helps the understanding of data; he suggests a wider definition of statistical literacy that embraces many aspects of data literacy (p. 22):

> "More specifically, I argue for an augmented definition of [statistical literacy] that includes […]:
> - understanding who collects data about us, why they collect it, how they collect it;
> - knowing how to analyze and interpret data from random and non-random samples;
> - understanding issues of data privacy and ownership;
> - knowing how to create basic descriptive representations of data to answer questions about real-life processes;
> - understanding the importance of the provenance of data;
> - understanding how data are stored;
> - understanding how representations in computers can vary and why data must sometimes be altered before analysis; and
> - understanding some aspects of predictive modeling."

The data-literate individual "can identify, collect, evaluate, analyze, interpret, present, and protect data." (Oceans of Data Institute, 2015, p. 2). Carter, Noble, Russell, & Swanson (2011) worked on a project that set out to better understand how socioeconomic secondary data is being used in helping to develop quantitative skills in UK university social sciences and focuses on World-Bank data in support of this. Gummer and Mandinach (2015) developed a framework for instruments to measure data literacy in order to promote capacity building around data literacy for teaching. Another important project that contributes to the improvement of

statistical literacy, based on data, is the initiative from Tuva (2018) that offers material on Data & Statistics Capacity Building Programs for Sustainable Development.

In general, all initiatives aimed at promoting statistical literacy and data literacy have to find an rely on the involvement of teachers, students, educational communities, national statistics offices, statistical societies, governments, private companies, and further partners and institutions that contribute to building capacity for statistics education. All these stakeholders are essential for creating a strong and wide-spread commitment, from people and institutions, whether at local, regional, or national level. Differences between the concepts of data literacy and statistical literacy have been proposed by Schield (2005), although there is no consensus on that: data literacy is related to technical issues needed to accessing, converting, and manipulating data while statistical literacy embraces the use of statistics as evidence used to back up arguments. More recently, Gould (2017) suggests that data literacy is statistical literacy: statistical literacy is augmented by data literacy and "the concept of data literacy goes a great distance towards providing the statistically literate individual with the skills and understanding [needed] in order to participate in a society that frequently collects data […] and uses it to make predictions about […] consumption and social patterns" (Gould, 2017). The ISLP supports, creates, and accompanies initiatives for improving statistical literacy and has been developing a network of coordinators in many countries located all over the world. These country coordinators use to share their teaching experiences and educational resources, some of them related to storytelling with data that improves visual and statistical literacy.

This paper describes and assesses the activities of country coordinators and discusses what lessons can be learned for advancing statistical literacy. The analyses are not derived from any systematic data collection but rather from secondary data gleaned from articles submitted to the ISLP Newsletter, and from the correspondence with country coordinators, and the broader experiences of the ISLP secretariat involved in liaising with country coordinators and organising national, regional, and global poster competitions. The experiences, practices, and innovations of country coordinators as well as the obstacles that may impair the improvement of statistical literacy are summarised in order to offer insight into the processes involved in promoting statistical literacy. This should build synergies in the way to share best-practice approaches and to learn about how obstacles are overcome. Section 2 provides some statistics and background information on the country coordinators and discusses their impact and tasks. Section 3 outlines experiences from the perspective of country coordinators. Section 4 discusses the strategic challenges the ISLP is facing at present and outlines tentative actions. In Section 5, some conclusions are drawn and an outlook is given on tasks with high priority for the ISLP.

2. NETWORK OF COUNTRY COORDINATORS

2.1 THE COVERAGE OF COUNTRY COORDINATORS

The network of country coordinators was launched in 2009 by searching for voluntary country coordinators (ISLP 2017). Originally it was envisaged that there would be just one coordinator in each country. Experience has proven, however, that depending on the geographic size of a country, the institutional structures, etc., this has not always been an effective approach. Today, there are several countries with coordinator teams rather than a single coordinator. For example, the European part of Russia has 16 country coordinators, and several other countries have two or three (see Appendix 1). The coverage of country coordinators varies by continent. European and African countries and some regions in Russia are already well represented; Europe and Africa have 42 and 41 country coordinators respectively (see Table 2).

At country level, Russia with 26 has the most country coordinators throughout. The number of coordinators in North America is currently low compared to other continents, but it should be noted that, depending on who are these coordinators and what supports they have in place, their numbers may be adequate.

Table 2. ISLP Network 2018

Continent	*Number of country coordinators*	*Number of participating countries*
Africa	41	23
Asia	27	15
Europe	42	19
North and Central America	8	6
Oceania	2	2
South America	14	8
Total	134	73

Source: ISLP website (Nov 2018)

Language has acted as a barrier in Asian and South American countries. For South America, operations have been galvanised by designating a dedicated regional coordinator for the entire continent to support the country coordinators. The ISLP has also used a Spanish-speaking undergraduate trainee to improve the communication (funded by Statistics Finland). In addition, the ISLP Executive Team was extended in 2017 with the result that it now includes members who are native speakers in Portuguese and Spanish.

2.2 TASKS OF COUNTRY COORDINATORS

The role of country coordinators is a complex one. In broad terms, the objective is to improve statistical literacy and promote the aims of the ISLP. While country coordinators have a free hand in how and what activities they organise, it typically involves designing promotional materials, organising national competitions, and coordinating the activities of the various actors involved. It also includes providing information to the ISLP team and sharing their recent experiences and approaches in their work for the ISLP Newsletter (e.g., ISLP, 2017).

As there are many actors involved, the role of a coordinator can be challenging, particularly if institutional coordination and cooperation is not already well developed. The coordinator must typically liaise between statistical societies, national or regional statistical offices, school and teacher networks, educational or curricula boards, libraries, academia, and other interested stakeholders. In particular, dealing with school systems can be complex and often involves a lot of time-consuming bureaucracy (Bulane, 2018; Djogbenou, & Akakpo, 2018; Nakazwe, 2018).

Traditionally the ISLP has focused on promoting statistical literacy among young people through the poster competition. But beyond the poster competition, there has always been a recognition of the need to share, promote, and learn from other good practices that contribute to the improvement of statistical literacy. For this reason, every second year, the ISLP identifies and awards a special *Best-Cooperative-Project* prize to a project that promotes statistical literacy. In 2013, the United Kingdom won the award in recognition of the extraordinary contribution made by the *CensusAtSchool* project. In 2015, Portugal won in honor of the work done by the popular statistical exhibition *Explorística*. Australia's National School's Poster Competition won in 2017.

The reports submitted by each country coordinator to the ISLP Executive Team every two years reveal that inadequate funding is a common and perennial challenge. Changes in the coordinator also appears to have a very disruptive impact, particularly when coordinators are not well reinforced by wider teams or an institutional infrastructure. In some developing countries, coordinators also report that economic, social, or political changes at national level can have a profoundly disruptive influence on the development of statistical literacy and on education in general. Abdullahi's (2018) description of events in Somalia bring this point vividly to life. Despite the day-to-day frustrations that come with being a country coordinator,

coordinators have reported that they find the role to be very rewarding. When asked why they participate in the ISLP and what motivates them to promote statistical literacy, coordinators reported about a variety of motives. Two are presented here to convey the flavour:

> "Sometimes I have to give a talk or a lecture, some of them regarding the ISLP, and I use to start with H. G. Wells' quote 'Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write'. […] All our theory, all data detached from context, are completely useless to the common citizen or even to researchers in non-mathematical areas; the importance relies on what our theory and data are saying about some real-life situation. So, if we can provide some help to develop the capacity of reading statistics results, despite of the statistical theory behind, we will be helping to improve the efficient citizenship in the sense of H. G. Wells in his quote." (Hugo Hernández, Mexico; personal Communication, June 7, 2017)

> "Let me tell you the truth. Statistical literacy is nothing except knowing about a very small zone of sciences, though this small piece of huge puzzle has been impressing the indispensable foundations of vast daily activities of human beings, not only in the fields of data science and statistics but also in the capability of understanding and perspective taking, each of which is entirely vital for the international development process. […] Let us be honest to ourselves, what could be more interesting indeed to perceive a *world* full of *good data* in the result of which people can find *better life* on the base of marriage of technology and this small zone of sciences, i.e., statistical literacy?"(Afshin Ashofteh, Iran; personal Communication, June 7, 2017)

The ISLP country coordinators can provide valuable insights into the challenges that teachers, educators, and countries are facing and into the opportunities available to develop statistical literacy. In some cases, their work has a positive impact beyond statistical literacy – for example, Nhlabatsi (2018) highlights how the ISLP has contributed towards breaking down traditional gender stereotypes in Swaziland. A challenge for the ISLP is how to collect and organise that intelligence and find a mechanism to feed it back to the statistics-education community. The ISLP Newsletter to some extent serves this purpose but more needs to be done to highlight the pioneering and heroic work that many coordinators are doing under sometimes very difficult circumstances.

2.3 IMPACT OF COUNTRY COORDINATORS

Most country coordinators work in universities or national statistical offices. In general, it is based on voluntary work and the desire to promote statistical literacy. In most cases, the network of country coordinators has been formed by contacting the ISLP director. They are asked to deliver a CV and explain why they are interested in joining the network. Most people who have been interested have been accepted if their background has been relevant to the project. Country coordinators are urged to network with other statistical organisations in their respective countries, such as universities, producers of official and other statistics and statistical societies. They are also encouraged to share their experiences within the ISLP network and to organise, amongst others, a national poster competition.

It can often be very difficult to assess the impact that a country coordinator has in a country, and how they have tangibly contributed to the improvement of statistical literacy. The role is vague and vast and will vary depending on the region and resources available. One metric of performance, albeit crude, is to assess how successful country coordinators have been in facilitating the participation in the ISLP poster competition. Table 3 summarises the participation in this competition for each continent. Based on 2018–2019 entries, this suggests that South-American country coordinators are the most successful as half of these countries submitted entries to the last poster competition. European coordinators follow with almost a third of countries participating. African are the least effective; but clearly, a variety of factors contribute to a coordinator being effective, such as, the institutional infrastructure, resources, participation of the National Statistical Institute, to name a few.

Table 3. Countries entering ISLP International Poster Competition by continent

Continent	*2012–13*	*2014–15*	*2016–17*	*2018–19*
Africa	2	8	11	6
Asia	10	5	7	6
Europe	13	13	11	13
North and Central America	2	3	3	4
Oceania	2	2	2	2
South America	2	3	3	2
Total	31	34	37	33

Source: ISLP website (Sep 2019)

A deeper analysis shows that not all participating countries are able to send their national winners to the international poster competition (explained later in this paper). While the growing participation is only one sign of progress and coordinator effectiveness, it is nevertheless a good indication of the maturity and robustness of the ISLP programme. Thus, crude as the indicator may be, it nevertheless raises questions for the ISLP executive that require some thought so that effective support for country coordinators can be developed. Consequently, further analyses of the participation in the poster competition is warranted.

In 2012, only 31 countries submitted entries to the international competition. By 2016, this had risen to 37 (see Table 3) but then plateaued remaining at 37 in 2018. Of course, the data on the participation presented in Table 2 is the latest available – some countries have only joined the ISLP since 2016 – whereas the data in Table 3 is historic. In the 2018-19 competition, we saw again that of the 95 participating countries, just over a third (37) submitted a national entry. The positive signs of growing participation of African countries faltered somewhat in 2018 with the number of entries falling back to 6; but, as will be discussed later, these countries and their country coordinators need support.

As is often the case, the aggregate numbers hide information. Appendix 2 shows in more detail the countries that have submitted entries for the last poster competitions. Only sixteen countries have submitted entries to all four competitions, of which half are European. In both Asia and Oceania, two countries respectively have entered all four competitions. But in the Americas, both North and South, only one country in each continent has participated in the competition (Mexico and Brazil); in Africa, no country has entered all four competitions. Nigeria had entered the first three competitions but did not submit an entry in 2018.

So while participation in the ISLP is increasing, Table 3 shows a stagnation in the growth rate. Appendix 2 reveals considerable changes, with countries entering but then dropping out again. For example, there were 15 countries that submitted entries to the 2014–15 competition but did not re-enter the 2016–17 competition. This number fell to 12 between 2016–17 and 2018–19, but worryingly, eight of these were in Africa. No country dropped out between 2016 and 2019 from Europe, Oceania or South America. The question is why? It will be one of the tasks of the ISLP executive committtee to investigate the reasons for it in order to better understand the challenges that the country coordinators are facing so that they can be supported more effectively. MacFeely, Campos, and Helenius (2017) described some issues related to the support mechanisms that are available in some countries but clearly there is more to learn, particularly with regard to developing countries.

3. ACTIVITIES AND EXPERIENCES OF THE COUNTRY COORDINATORS

3.1 INQUIRY TO COUNTRY COORDINATORS

In summer 2016, the project carried out an inquiry among country coordinators to find out:

- What type of activities country coordinators organise in their country;
- Countries' good practices; and
- Possible obstacles to country-coordinator activities.

The ISLP also asked coordinators to confirm that they were willing to continue in the network and generally used the opportunity to explore or ascertain how active each network really is on the ground. A report was received from 49 countries and a special edition of the ISLP Newsletter, compiled from these reports, was published in March 2017 (ISLP, 2017).

A further inquiry was carried out in 2018 and 30 reports were received. The reports were again published in the ISLP Newsletter in December 2018 (ISLP, 2018). In addition, many country coordinators wrote short answers by email informing the ISLP secretariat about their current activities. Some outline the real on-the-ground difficulties and challenges of carrying out the project owing to hazardous or unstable situations in their country. Many also highlight that financial challenges posed a real barrier to organising activities.

These reports display inspiring examples of statistical-literacy projects, and present a range of good practices widely used around the world. These practices to educate the youth and promote statistical literacy include hosting high-level conferences, writing books, developing games, co-ordinate quizzes and competitions, developing digital-learning environments, hosting websites, and organising summer camps for children and young people. Successful projects are shared across borders and new ideas continually emerge. Statistics students participate in many of these projects, which are organised in cooperation between schools, universities, statistical and educational institutions, and non-governmental organisations.

3.2 ACTIVITIES IN THE VARIOUS COUNTRIES

There are numerous great examples of statistical literacy projects; it is only possible to mention a few. Examples are extracted from the reports of the country coordinators published in the ISLP Newsletter.

- In Brazil, the *Statistical Multimedia Literacy Programme* targets youth in vulnerable situations, aiming to improve their statistical skills and teach critical citizenship. By combining multimedia technologies and real-life examples they enhance the learning experience (Porciúncula, & Samá, 2017).
- In Ecuador, a teaching programme for children called '*We are different*', explains cultural diversity using statistics and visualisation tools. The programme also includes songs to be used as educative material, describing societal issues highlighted by statistics (Pérez Caicer, 2017).
- In Germany, a school reform programme has included statistical education at all levels from primary to upper secondary schools.
- Universities from Germany, Hungary, Israel, Portugal and the UK, with support from the EU Erasmus programme, launched a *ProCivicStat* (n.d.) project to create a digital learning environment to engage citizens, teachers and students in statistical thinking (Ullmann, 2017). The results are available on our website (ISLP, n.d.).
- Statistics Norway increasingly uses infographics in statistics as well as in the general education (Stabell, 2017).
- Also, Ireland has reformed the mathematics and statistics syllabus for secondary school education and has succeeded in engaging students widely in statistics via the ISLP competition (Leavy & McCuirc, 2017).

- Spain has established the Statistical Olympics for secondary-school students to teach them how to analyse statistics (Serradó Bayés, 2017). The competition has now morphed into the European Statistics Competition under the aegis of Eurostat. In 2018, 11,200 students participated from different parts of Europe (Gálvez, 2018).
- The National Statistics Office of Malta has developed its first interactive online platform, where it is possible to compare the population between different parts of the Maltese Islands (Borg, 2017).
- The Czech Republic created a 'Mini-Census' for young people to improve their understanding of how statistics relates to every-day life of people (Fischer, 2017).
- Statistics Estonia as well as Statistics Finland have developed a fruitful cooperation with teacher organisations (Lauk, 2018; Helenius, 2018).
- Australia, in turn, held a conference in 2016 with participants from elementary-school teachers to industry leaders to brainstorm about how to develop statistics education in the country (Howley, 2017).
- India holds summer camps for students where statistical approaches to problem solving are discussed and demonstrated (Hooda & Singh Kaurav, 2017).

3.3 ISLP POSTER COMPETITIONS

The ISLP poster competition has proven to be a successful tool for engaging young people and introducing them to statistics. Since its establishment in 2010, the number of participants has grown from an initial 5,000 students from 17 countries to more than 12,000 students in 2016–17. All in all, seven competitions have been organised, five of which have been poster competitions. The poster competition provides a practical and enjoyable instrument for teaching students how to conduct statistical research, from the formulation of the research question, the selection of an appropriate research method, the production of informative data, an appropriate analysis of the data, and finally to the presentation of the information and statistics gained in the whole process, and drawing conclusions thereof. The competition is equally suitable for developed and developing countries because the tool with which the poster is made is not decisive in the competition but the work as a whole.

MacFeely, Campos, and Helenius (2017) argue that it is not surprising that a key factor of success in organising statistical-literacy competitions is cooperation between different organisations Typically, the institutions where coordination and cooperation is required include: the National Statistical Institute (NSI), secondary and tertiary educational institutions, universities, government departments for education (or science and technology), statistical associations, and other organisations, such as mathematics curricula boards, and sponsors. Coordination can help in raising finance, provide data, share technical and logistical expertise, or assist in marketing and media capture. All institutions can bring something useful to the table. This type of coordination is a notable feature of competitions in Finland, India, Japan, Russia, Spain, Italy, Ireland, and New Zealand. Building such a network of stakeholders should be one of the primary objectives for all country coordinators. As Bulane (2018) notes, running an ISLP competition is a complex operation and cannot be done alone.

3.4 RESTRICTIONS AND POSSIBILITIES

In different countries, activities to promote statistical literacy take different trajectories. In some countries, the challenge has been that teachers do not have sufficient knowledge or methods for statistical education. For this reason, many countries have organised courses and workshops for teachers. Resource constraints and administrative rigidity are also challenges faced by some. Because the starting points are different in various countries, the objectives and focus of the activities can vary considerably.

Developed and developing countries face different kinds of challenges in promoting statistics education and literacy. Many developing countries would like to have access to off-the-shelf learning materials in their native languages. The ISLP offers a variety of teaching resources and links to useful websites (ISLP, n.d.). The ISLP are working to offer a wider set of solutions for distributing learning material in the future. But to date, unfortunately, the majority of resource materials are available only in English, which restricts their use.

Developed countries are coming up with various applications to support learning for the needs of young people. Distributing the applications to a wider audience can be complicated as solutions in one country do not necessarily work well in other countries, for a variety of reasons ranging from linguistic to cultural givens. Sharing good practices is nevertheless seen as a sensible objective, as teaching content (statistics and understanding it) is by and large the same for all countries. A good example of an idea that has been shared across borders is the *CensusAtSchool* network. This cooperation began in the United Kingdom in 2000 to promote statistical literacy in school children by using their own data. The programme is now running in the UK, New Zealand, Australia, Canada, South Africa, Ireland, Japan, and the United States (Census at School, 2018). Another example is the European Statistics Competition, which started in Spain and has now spread over many countries in Europe (Gálvez, 2018).

The work of communicating statistics and developing strategies is never done. For the wider public, statistics can appear complicated and difficult to understand. In some developing countries, the level of statistical literacy is particularly low. Gender inequality is also related to access to statistical literacy and, more generally, to education regardless of the positive developments that can be observed (UNESCO, 2017). An UNCTAD study (UN Conference on Trade and Development, 2016) comparing four global composite gender inequality indices highlighted the importance of access to education for economic and political participation as well as health status.

Despite the challenges outlined above, all around the world, country coordinators and others are implementing initiatives to improve statistical literacy in one way or another. Progress is being made.

- Ghana, for example, has despite several challenges successfully launched a statistical workshop on information and communication technologies for young statisticians to improve their software skills (Novignon, 2017) – see Figure 1.
- Gambia is in the process of establishing an association of young statisticians who work to promote statistical literacy in cooperation with schools, universities, and the national statistical institutions (Mulva, 2017).
- In Iran, the first book dealing with statistical literacy in the Persian language was published in 2016. This was accompanied with the launch of a Persian website dedicated to statistical literacy and the founding of the House of Statistics in the scientific city of Isfahan (Ashofteh, 2018).
- Haiti, despite all the difficulties faced there, has launched its first statistical MOOC (Massive Online Open Course), accessible for everyone interested in statistics (Bolivar, 2017).
- In Togo, statistical literacy is promoted by training Statistics Techniques Agents within the government (Plambou Anissa, 2017).

3.5 DEVELOPMENT IN LATIN AMERICA

Improving statistical literacy has been a focus of several international conferences and associations for many years, such as, the International Statistical Institute (ISI), the Conference on Statistics Education (ICOTS), and the International Association for Statistical Literacy (IASE). Over the last thirty years, this work has helped to advance statistical literacy around the world, but particularly in developing countries. Unfortunately, Latin American countries have

had little opportunity to participate in these meetings, owing primarily to language barriers. However, the first meeting of the Latin American Education Statistics (ELEE) was held in Monterrey in 2010 with the objective of bringing together educators and statistics teachers from all around Latin America with the aim of exchanging experiences.

Although statistical education in Latin America has become more prominent in recent years, an ongoing problem is the low availability of resources and teaching materials in Spanish. Consequently, Del Pino (2006) has described statistical education in Latin America as being still at an early stage of development, where initial progress has been achieved primarily through isolated, individual actions. There is a great imbalance between the developed countries and developing countries. Developed countries generate a lot of information and resources but little can be shared with or utilised by developing countries since most of these resources are not available in native languages. As language poses a real barrier to progress, capacity development and cooperation projects need to take this into account in order to improve and strengthen statistical literacy in developing countries.

As noted earlier, while the ISLP website provides a wealth of information and teaching resources, most of these materials are in English only so that they are of limited use in Latin America. The ISLP has aimed to improve the situation by appointing a special coordinator for Latin America, dedicated to strengthening and supporting the activities in these countries. The challenges experienced Latin America is reflected by the low participation in the ISLP poster competition (see Table 3), with only two or three countries joining each competition and only one country (Brazil) having entered the last three competitions consecutively (see Appendix 2).

In 2017, at the 61st ISI World Statistics Congress in Marrakech, Morocco, the Advisory Board of the ISLP appointed a third Deputy Director to the ISLP. This decision was taken to improve cooperation and provide more support to Latin-American countries. Thus, one of the explicit objectives of the ISLP project is now to provide more content, activities, and resources in Spanish as well as to increase participation in the ISLP competitions. It is important to improve the statistical skills and build capacity of teachers at all levels, graduate students, and staff of statistics institutions and associations that can further promote statistical literacy.

The first tangible result of the new Deputy Director for Latin America was the organisation of a regional poster competition, which was designed as a ‘pre-competition’ that deliberately takes into account the local school calendar. The declared aim of this intiative is to increase and improve participation of Latin-American countries in the ISLP International Poster Competition. The benefits of this regional approach are already evident (see Table 4).

Table 4. Participation of Latin-America in the ISLP Poster Competition 2016-19

Country	*2016–17*	*2018–19*
Argentina	0	107
Brazil	15	22
Chile	0	41
Colombia	0	550
Ecuador	30	150
Bolivia*	0	97
Venezuela*	0	16
Total	45	983

Source: 13th Latin American Congress of Statistical Societies (CLATSE), Guadalajara, Mexico, 2018

The announcement of the winners and runners-up of the Latin-American Poster Competition, for each category and country, took place at the 33rd National Statistics Forum (FNE) and the 13th Latin American Congress of Statistical Societies (CLATSE), held in

Guadalajara, Mexico , in 2018. The countries involved were Argentina, Chile, Brazil, Ecuador and Colombia. Bolivia and Venezuela* joined later in 2019 adding an additional 113 students. The winners continued directly to the international final that was held at the ISI World Statistics Congress in Kuala Lumpur, Malaysia, in August 2019. The objectives of the poster contest in Latin America were achieved. As Table 4 illustrates, the 2016–17 competition had only two countries and 45 students participating. For the 2018–19 competition, participation has increased significantly, with 7 countries and more than 983 students involved. In addition, the competition received tickets for all three age categories.

4. STRATEGIC DEVELOPMENT OF THE ISLP

One of the challenges facing the ISLP is how to balance the competition across regions of the world with very different school calendars, levels of development, and available resources. Arguably, the ISLP has not yet found that balance. The manifestations of this are clear in the results. The challenge of school calendars has been answered by prolonging the participation period of the contest, which now is over a year. Table 5 illustrates the dominance of a few countries, notably: Australia, Finland, Ireland, and South Korea. These are all developed countries with strong internal coordination and support mechanisms in place. While the results of the poster competition are fair, they may nevertheless be disheartening for countries that do not enjoy the same resources. One of the key challenges in the coming years will be to consider regional structures or competitions to encourage countries in each continent or development status to participate.

A curiosity, and something for the ISLP Executive to consider further, is why Asian countries, such as Singapore, Hong Kong, and Taiwan who tend to rank very highly in standardised global numeracy tests such as TIMSS (n.d.) do not enter the ISLP competition. Equally, why has South Korea performed so well in the ISLP competition whereas Japan that boasts the longest-running statistical competition in the world, has not.

Table 5. Winners of ISLP Senior and Junior Poster Competitions 2010–17

Year	*Rank*	*Senior*	*Junior*
2018–19	1	Ireland	Ireland
	2	Poland	Bulgaria
	3	Russia	South Korea
2016–17	1	Australia	South Korea
	2	Kazakhstan	Finland
	3	Ireland	Mexico
2014–15	1	Ireland	Australia
	2	South Korea	Kenya
	3	Poland	Ireland and South Korea
2012–13	1	Finland	South Korea
	2	Ireland	Australia
	3	Italy	Ireland
2010–11	1	Finland	Canada
	2	Portugal	Portugal
	3	Canada	New Zealand

Source: ISLP website (Sep 2019)

The Programme for International Student Assessment (PISA; OECD, 2016; 2017) suggests that students in Singapore, Japan, China (Hong Kong, Macao, and Taipei), South Korea, Canada, Estonia, Finland, New Zealand and Australia perform well both in mathematics and collaborative problem solving – skills that should assist with statistical analyses. It is also observed that Latin-American countries were among the last in the global results although there have been some notable improvements in performance, such as, Peru and Chile. But there remains much to be done to strengthen the capacities across Latin America and other developing regions.
These simple analyses, naturally, provoke questions, such as:

(1) Why have neither China nor Estonia entered the ISLP competition yet? Both countries have coordinators and seem to have natural talent and supportive education systems.
(2) Why did Japan, with such a long history of statistical skills and high performance in global standardised tests, fare better in the ISLP competition? Are there cultural or language barriers that penalise Japan? What are the differences between South Korea and Japan that have resulted in such differences in the achievement?
(3) How can developing countries be supported to promote their participation?
(4) Why Peru, a country that has enjoyed improved PISA scores, has had so little participation in the poster contest?
(5) How important is the commitment of the coordinators to the continued participation of countries in the competition?
(6) Is the level of development of each country an important factor for the participation and or the success? Why did Colombia have 550 students participating in the last competition, Ecuador more than 150, yet, Bolivia had only 100 participants?

The appointment of a Deputy Director for Latin America and the new regional ISLP competition appear to have had immediate and beneficial results. This raises some important strategic questions for the ISLP looking forward. Not least, is there merit in adopting a similar approach for Africa, and perhaps Asia, where languages barriers and other regional specificities clearly exist. Given the broader definition of statistical literacy adopted by the ISLP, the social and cultural features of each region require careful consideration. Arguably, the same could be said for each country – it is here that country coordinators must play a central role.

In order to support the aforementioned, the website of the ISLP (n.d.) aims to provide a platform that offers opportunities for acquiring competencies and sharing knowledge. It offers some easy-to-apply tools and methods, which can have long-term positive impact. The ISLP plans to offer more content in different languages in the future, especially in Spanish, to encourage participation in the Latin-American and the ISLP poster competitions.

It should be noted that many countries still do not have a country coordinator and big countries, such as China, should have various coordinators. Russia has developed a well-functioning structure by appointing regional coordinators. Feedback from coordinators reveals that organising the competition is an arduous task, especially in developing countries where financial resources are scarce. Thus, to strengthen the activities, it is essential to be able to offer financial support for country coordinators. At the moment, the ISLP has merely been able to finance the prizes of the Poster Competition and the Best-Cooperative-Project Award. Key sponsor has been Technology Industries of Finland, Centennial Foundation. ISLP does not receive funding from the International Statistical Institute (ISI) or the International Association for Statistical Education (IASE). Funding received from the Wakimoto Memorial Fund in 2018 provides the first opportunity to distribute small grants in 2019.

From a strategic perspective, there are a range of challenges facing the ISLP if it is to thrive and develop over the coming years. Table 6 outlines some of the main objectives and actions.

Table 6 – ISLP strategic objectives and actions to develop statistical literacy

Objectives	*Expected Results*
Prepare and support international, national, and regional projects on statistical literacy.	Projects that cover all walks of life and consider the technological and scientific development as well as cultural diversity.
Widen participation in ISLP competitions.	Increased number of country coordinators and participants in Africa, Asia, and Latin America.
Promote democracy.	Promote understanding and use of knowledge in society, by both citizens and decision-makers.
Develop ISLP website to provide resources in various languages.	Best practices shared and used within the ISLP community world-wide.
Strengthen community development through ISLP activities tailored to minority groups such as women, youth, and ethnic minorities.	Equal possibilities for acquiring statistical literacy and usage skills.
Encourage networking and joint projects by different institutions such as government agencies, universities, and non-governmental organisations.	Promoting statistical literacy is part of school curricula.
Secure a financial base for the project.	Ability to support coordinators in developing countries.
Support communication strategies on statistical literacy.	Improved capacity to communicate statistical literacy (ISLP website continuously updated).

5. CONCLUSION

In many aspects, the ISLP has made good progress towards developing future generations of statisticians but language barriers and lack of resources still pose challenges. The efforts in developing countries are particularly important as the ISLP contributes both to developing the skills of young statisticians but also to developing a culture of evidence-informed decision making in 'young' statistical systems. In addition, to the dedicated work of the coordinators in the field of statistics, promoting the objectives of the ISLP, like any volunteer work, requires support and commitment of all quarters of society. This article hopefully provides inspiration and encourages new actors to get involved and promote statistical literacy and skills worldwide.

A key factor contributing to the progress made, has been the widening network of enthusiastic and dedicated country coordinators. Their role is crucial to the success of the ISLP. The articles, published in the ISLP Newsletter, are witnesses to their hard work; they also highlight the variety of conditions and circumstances that country coordinators must deal with. The role of the ISLP must be provide more support to these front-line ambassadors in the field.

Steps taken by the ISLP to address particular concerns in Latin America have had beneficial results. Yet, much work remains to be done, both in Latin America and other regions around the world. This means providing additional support, but perhaps also extending the Latin-American model to other regions. It also means considering, more seriously, the barriers presented by language and culture. As a global actor, attempting to engender statistical capacity in to future generations, respecting linguistic, cultural, and gender diversity, establishes a core value of the ISLP. Statistical literacy can contribute to these factors a lot. The ISI's long-term motto is right, 'Statistics for a better world'. The ISLP contributes to this aim, particularly by investing in young people – so perhaps the ISLP motto is 'Statistics for a better world tomorrow'. Young people are seen as a resource for the future and also as facilitators of statistical competencies through studies, work, and everyday life. It is essential for the project to cooperate with teachers and to support them.

REFERENCES

Abdullahi, M. H. (2018). The Progress of official statistics in Somalia. *ISLP Newsletter, 10*(2), 12.

Ashofteh, A. (2017). Recent news and activities regarding statistical literacy. *ISLP Newsletter, 9*(1), 24.

Ben-Zvi, D., & Garfield, J. (2004). Statistical literacy, reasoning, and thinking: Goals, definitions and challenges. In D. Ben-Zvi, & J. Garfield (Eds.), *The challenge of developing statistical literacy, reasoning and thinking* (pp. 3–15). Dordrecht: Kluwer.

Bolivar, B. (2017). Haiti. *ISLP Newsletter, 9*(1), 23.

Bulane, R. (2018). Promotion of statistical literacy in Lesotho. *ISLP Newsletter, 10*(2), 9.

Carter, J., Noble, S., Russell, A., Swanson, E. (2011). Developing statistical literacy using real world data: Investigating socioeconomic secondary data resources used in research and teaching. *International Journal of Research & Method in Education, 34*(3), 223–240.

Census at School (2018). *About census at school*.
[Online: ww2.amstat.org/CensusAtSchool/about.cfm]

CensusAtSchools (n.d.). *Census at School is an international classroom project that engages students in grades 4–12 in statistical problemsolving*.
[Online: www.censusatschool.ie/en/home]

D'Amelio, A. (Ed.) (2017). *ISLP Newsletter, 10*(1).

Del Pino, G. E. (2006). International cooperation in statistics education in Latin America: The Chilean Experience. In A. Rossman & B. Chance (Eds.), *Working cooperatively in statistics education. Proceedings of the Seventh International Conference on Teaching Statistics (ICOTS 7)*. Voorburg: International Statistical Institute and International Association for Statistical Education.
[Online: iase-web.org/Conference_Proceedings.php?p=ICOTS_7_2006]

Djogbenou, R., & Akakpo, G. (2018). Statistical literacy in Côte d'Ivoire. *ISLP Newsletter, 10*(2), 8.

Fischer, J. (2017). Czech statistical literacy improvement. *ISLP Newsletter, 9*(1), 14.

Gal, I. (2002). Adults' statistical literacy: Meanings, components, responsibilities. *International Statistical Review, 70*(1), 1–25.

Gálvez, A. (2018). Spanish participation in the ISLP poster competion. *ISLP Newsletter, 10*(2), 30.

Garfield, J., & Ben-Zvi, D., Chance, B., Medina, E., Roseth, C., & Zieffler, A. (2008). The discipline of statistics education. In J. Garfield, & D. Ben-Zvi, *Developing students' statistical reasoning* (pp. 3–19). New York: Springer.

Gould. R., (2017), Data literacy is statistical literacy. *Statistics Education Research Journal, 16*(1), 22–25. [Online: iase-web.org/Publications.php?p=SERJ]

Gummer, E., & Mandinach, E. (2015). Building a conceptual framework for data literacy. *Teachers College Record, 117*, 1–22.

Helenius, R. (2018). Everything is founded on cooperation. *ISLP Newsletter, 10*(2) 24.

Hipótesis Alternativa (n.d.). Boletín de IASE para América Latina.
[Online: www.ucv.ve/hipotesis]

Hooda, D. S., & Singh Kaurav R. P. (2017). Activities for developing statistical literacy in India. *ISLP Newsletter, 9*(1), 23.

Howley, P. (2017). Australian report. *ISLP Newsletter, 9*(1), 7.

ISLP (2017). The second call for country representatives.
[Online: iase-web.org/islp/Activities.php?p=Call_for_Country_Coordinators].

ISLP (2017). *Newsletter, 1*(9). [Online: iase-web.org/islp/Publications.php]

ISLP (2018). *Newsletter, 2*(10). [Online: iase-web.org/islp/Publications.php]

ISLP (n.d.). *International Statistical Literacy Project*. IASE and ISI.
[Online: iase-web.org/islp/Poster_Competition_2014-2015.php]

Lauk, A. (2018), Greetings from Estonia. *ISLP Newsletter, 10*(2), 23.

Leavy, A., & McCuirc, E. (2017). Ireland Report. *ISLP Newsletter, 9*(1), 26.
MacFeely, S., Campos, P., & Helenius, R. (2017). Key success factors for statistical literacy poster competitions. *Statistics Education Research Journal, 16*(1), 202–216. [Online: iase-web.org/Publications.php?p=SERJ]
Mulva, S. N. (2017). Greetings from Gambia. *ISLP Newsletter, 9*(1), 18.
Nakazwe, C. (2018). YASA Zambia's first ISLP Poster competition experience. *ISLP Newsletter, 10*(2), 14.
Nhlabatsi, T. N. (2018). Statistical literacy in Swaziland. *ISLP Newsletter, 10*(2), 13.
Novignon, J. (2017). Report on how statistical literacy has been improved in Ghana. *ISLP Newsletter, 9*(1), 21.
Nussbaumer Knaflic, C. (2015). *Storytelling with data – A data visualization guide for business professionals*. New Jersey: Wiley.
Oceans of Data Institute (2015). *Building global interest in data literacy: A dialogue*. Waltham, MA: Educational Development Center. [Online: oceansofdata.org/our-work/building-global-interest-data-literacy-dialogue-workshop-report]
OECD (2016). *PISA 2015 Results: Excellence and equity in education*. Paris: OECD Publishing. [Online: dx.doi.org/10.1787/9789264266490-en]
OECD (2017). *PISA 2015 Results: Collaborative problem solving*. Paris: OECD Publishing. [Online: dx.doi.org/10.1787/9789264285521-en]
Pérez Caicer, W. (2017). Alfabetización de estadística en Ecuador. *ISLP Newsletter, 9*(1), 15.
Plambou Anissa, B. (2017). Statistical literacy promotion in Togo. *ISLP Newsletter, 9*(1), 48.
Porciúncula, M., & Samá, S. (2017). Leme. Statistical multimedia literacy. *ISLP Newsletter, 9*(1), 9.
ProCivicStat (n.d.). *Promoting civic engagement via explorations of evidence*. A project supported by the European Commission. [Online: iase-web.org/islp/pcs/]
Schield M. (2005). Information literacy, statistical literacy, data literacy. *IASSIST Quarterly, 28*(2–3), 6–11. [Online: doi.org/10.29173/iq790]
Schield, M. (2010). Assessing statistical literacy: Take care. In P. Bidgood, N. Hunt, & F. Jolliffe (Eds.), *Assessment methods in statistical education: An international perspective* (pp. 133–152). New York: Wiley.
Serradó Bayés, A. (2017). Great news from Spain! *ISLP Newsletter, 9*(1), 43.
Stabell, C. (2017). Activities of Statistics Norway to improve statistical literacy. *ISLP Newsletter, 9*(1),33.
Tuva (2018). *Build data literacy across all levels of your organization*. [Online: tuvalabs.com/]
Ullmann, P. (2017). On the improvement of statistical literacy in Germany. *ISLP Newsletter, 9*(1), 20.
Wallman, K. K. (1993). Enhancing statistical literacy: Enriching our society. *Journal of the American Statistical Association, 88*(421), 1–8. [Excerpts Online: www.statlit.org/StatLitHistory.htm]
TIMMS (n.d.). Trends in International Mathematics and Science Study. [Online: www.acer.org/au/timss]
UN Conference on Trade and Development (2016). *Development and globalization 2016: Facts and figures*. [Online: stats.unctad.org/Dgff2016/]
UNESCO (2013). *Second global report on adult learning and education: Rethinking literacy*. Hamburg: UNESCO Institute for Lifelong Learning. [Online: unesdoc.unesco.org/ark:/48223/pf0000222407]
UNESCO (2017). *Literacy rates continue to rise from one generation to the next. Fact Sheet no. 45*. Montreal: Unesco Institute for Statistics. [Online: uis.unesco.org/en/topic/literacy]

APPENDIX 1: ISLP COORDINATORS BY COUNTRIES AND CONTINENT

Africa		*Asia*		*Europe*		*North & Central America*		*Oceania*		*South America*	
Algeria	1	Afghanistan	1	Armenia	1	Canada	1	Australia	1	Argentina	3
Angola	1	Bangladesh	1	Austria	1	Costa Rica	1	New Zealand	2	Bolivia	1
Benin	2	Bhutan	1	Bulgaria	1	Haiti	1			Brazil	4
Botswana	2	China	1	Croatia	1	Mexico	2			Chile	3
Burkina Faso	2	India	2	Czech Rep.	1	Panama	1			Colombia	2
Cameroon	1	Indonesia	1	Estonia	1	Trinid.Tobago	1			Ecuador	1
Chad	2	Iran	2	Finland	3	USA	2			Peru	2
Congo	1	Japan	1	France	1					Uruguay	1
Egypt	2	Kazakhstan	1	Georgia	1					Venezula	1
Ethiopia	2	Kuwait	1	Germany	1						
Ghana	4	Malaysia	1	Hungary	1						
Ivory Coast	1	Nepal	2	Ireland	1						
Kenya	3	Pakistan	3	Italy	4						
Lesotho	2	Palestine	1	Malta	2						
Malawi	2	Philippines	1	Norway	1						
Mali	1	Russia	10	Poland	1						
Marocco	1	Saudi Arabia	1	Portugal	1						
Mozambique	1	South Korea	2	Romania	1						
Niger	1	Sri Lanka	1	Russia	16						
Nigeria	5	Taiwan	1	Serbia	1						
Rwanda	1			Slovakia	1						
Senegal	2			Slovenia	1						
Sierra Leone	1			Spain	4						
Somali	1			Turkey	3						
South Africa	5			UK	1						
Swaziland	1			Ukraine	2						
Tanzania	5										
Togo	2										
Uganda	2										
Zambia	1										
Zimbabwe	1										

Africa		*Asia*		*Europe*		*North & Central America*		*Oceania*		*South America*	
31	59	20	35	26	53	7	9	2	3	9	18

APPENDIX 2: SUBMISSIONS TO THE ISLP POSTER COMPETITION 2012 – 19

Africa	*2012 –13*	*2014 –15*	*2016 –17*	*2018 –19*	*Asia*	*2012 –13*	*2014 –15*	*2016 –17*	*2017 –18*	*Europe*	*2012 –13*	*2014 –15*	*2016 –17*	*2018 –19*
Benin	–	–	1	–	Bangladesh	1	1	–	–	Bulgaria	1	1	–	1
Botswana	–	1	–	–	Bhutan	1	–	–	–	Czech Rep.	1	1	1	1
Cape Verde	–	–	–	1	India	1	1	1	–	Finland	1	1	1	1
Egypt	–	–	–	1	Indonesia	1	–	–	–	Greece	–	1	–	–
Ghana	–	–	–	1	Japan	1	1	1	1	Hungary	1	1	1	1
Ivory Coast	–	–	1	1	Kazakhstan	1	–	1	1	Ireland	1	1	1	1
Kenya	–	1	–	–	Kuwait	1	–	1	–	Italy	1	1	1	1
Lesotho	–	1	–	–	Mongolia	–	–	–	1	Netherlands	–	–	–	1
Malawi	–	1	–	–	Palestine	–	–	1	–	Poland	1	1	1	1
Marocco	–	–	1	–	Russia	1	–	1	1	Portugal	1	1	1	1
Mozambique	–	1	–	–	Saudi Arabia	–	1	–	–	Russia	–	1	–	1
Niger	–	–	1	1	South Korea	1	1	1	1	Serbia	–	–	1	1
Nigeria	1	1	1	–	Taiwan	–	–	–	1	Slovakia	1	1	–	–
Somali	–	–	1	–	UAE	1	–	–	–	Slovenia	–	1	–	–
South Africa	–	1	1	–						Spain	1	1	1	1
Swaziland	–	1	–	–						Sweden	1	–	–	–
Tanzania	–	–	1	1						Turkey	–	–	1	1
Togo	1	–	–	–						UK	1	–	1	1
Uganda	–	–	1	–						Ukraine	1	–	–	–
Zambia	–	–	1	–										
Zimbabwe	–	–	1	–										

Africa	*2012 –13*	*2014 –15*	*2016 –17*	*2018 –19*	*Asia*	*2012 –13*	*2014 –15*	*2016 –17*	*2017 –18*	*Europe*	*2012 –13*	*2014 –15*	*2016 –17*	*2018 –19*
Total	2	8	11	6		10	5	7	6		13	13	11	14

North & Central America	*2012 –13*	*2014 –15*	*2016 –17*	*2018 –19*	*Oceania*	*2012 –13*	*2014 –15*	*2016 –17*	*2017 –18*	*South America*	*2012 –13*	*2014 –15*	*2016 –17*	*2018 –19*
Canada	–	1	1	1	Australia	1	1	1	1	Argentina	1	–	1	1
Haiti	–	–	1	–	New Zealand	1	1	1	1	Bolivia	–	–	–	1
Mexico	1	1	1	1						Brazil	1	1	1	1
Panama	–	–	–	1						Chile	–	1	–	1
USA	1	1	–	1						Colombia	–	–	–	1
										Ecuador	–	–	1	1
										Peru	–	1	–	–

North & Central America	*2012 –13*	*2014 –15*	*2016 –17*	*2018 –19*	*Oceania*	*2012 –13*	*2014 –15*	*2016 –17*	*2017 –18*	*South America*	*2012 –13*	*2014 –15*	*2016 –17*	*2018 –19*
Total	2	3	3	4		2	2	2	2		2	3	3	6

Source: ISLP Website (Sep2019)