Statistical Training needs Assessment Tool

STAT

A tool to identify, prioritize and meet learning needs to produce official statistics

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Global Network of Institutions for Statistical Training (GIST)

Content

A brief overview of STAT

The **Statistical Training needs Assessment Tool**, also known as **STAT**, is a tool developed for National Statistical Offices (NSOs) to assess and analyze skills gaps of staff and decide on how to prioritize and meet their learning needs by using different types of informal and formal learning approaches.

STAT focuses on all types of job functions including staff working in statistics production, IT, communication, management, finance, HR, and other administrative functions. Staff working with statistics production within the National Statistical System (NSS) can also be included in the assessment.

STAT was piloted in cooperation with the NSOs in Colombia, Ghana, Maldives, Malawi, Mexico, and Papua New Guinea

How does STAT work?

Assessing

STAT uses three questionnaires set up in Google Forms to assess the levels of skills and upskilling needs. The questionnaires, which include more than 150 skills, address different respondents and purposes:

- A questionnaire for all staff including managers at the NSO to self-assess the individual level of knowledge and upskilling needs of relevant skills.
- A questionnaire for managers at the NSO to identify gaps in their team's ability to perform current as well as future tasks. The questionnaire is intended to capture institutional needs and can be compared to the questionnaire for staff.
- A questionnaire for staff working with statistics production at other institutions within the NSS (i.e. ministries and other public institutions).

The questionnaires are developed to capture a wide range of different and cross-cutting skills relevant to different types of job functions. Since skills requirements can vary from country to country, the questionnaires are designed to be flexible, and can thus be accustomed to meet the specific requirements of the country by deleting or adding skills.

Analyzing

STAT provides recommendations on how to analyze and visualize data from the surveys. To help facilitate this process, STAT provides R codes to extract the data from Google Sheets to Power BI. The NSO can of course also decide to use another analysis tool.

Prioritizing

The next step is to prioritize among the many needs that the survey will likely show and decide on which skills are most crucial and beneficial for the organization. STAT provides recommendations to help this process. There are several considerations to take such as choosing skills where many have a need over the few or where few have a need, but the organization needs to prioritize.

Meeting learning needs

Once the NSO has a list of priorities, it has to decide on how the needs can be met. It could consider internal resources, the use of free online materials, and the use of trainers from academia, the private sector, or international and regional partners (free or paid).

Lack of funding is often a challenge to meet all needs. However, the NSO can even with limited funds develop a realistic institutional learning plan. Focusing on informal learning such as mentoring and free e-learning as well as offering a few facilitated face-to-face courses by using in-house expertise is a way to get started without making the task too costly.

STAT can also be used to identify those learning needs where support from partners such as regional and international organizations, bilateral donors, etc. are needed if in-house or nationally available resources are lacking. It allows the NSO to take the lead in highlighting learning needs based on an overview of priorities.

Promoting new ways of staff learning

STAT promotes the understanding of learning as a broader concept besides classroom training. Staff can learn in many different ways and NSOs should benefit from the wide range of learning approaches available such as mentoring, networking, knowledge sharing, reading manuals, e-learning, and of course face-to-face learning. Most learning takes place when the staff is doing the job.

STAT promotes the use of in-house resources to rely less on external resources. The NSO should consider using staff as trainers as it strengthens the self-sufficiency of the organization, provides development opportunities for staff, and targets learning to the specific needs of the organization. Thus, building a culture where staff are motivated and supported to train others is beneficial for the organization.

STAT also promotes the use of free e-learning and offers a list of platforms where free e-learning is available. E-learning does not have to be an individual activity and there are different ways the learning outcome and interest in e-learning could be supported.

How to access STAT

STAT can be downloaded from GIST's website: https://unstats.un.org/gist/resources/statistical-training-needs-assessment-tool/ - under the section "Links to STAT". STAT consists of the following files:

- Quick Guide to Implementing STAT
- Statistical Training needs Assessment Tool Guidance
- Three Google Forms questionnaires
- Final skills list.csv
- Individual Needs Assessment model.R
- Institutional Needs Assessment model.R
- Institutional Needs Assessment data read in.R
- NSS Needs Assessment model.R
- STAT.pbix

1. Building a capable and sustainable national statistical office

The quality of statistics produced by the National Statistical Office (NSO) and within the National Statistical System (NSS) depends to a large degree on the capabilities of their staff, as well as the structures and processes to support these staff to maintain and increase their capabilities. With the increase in indicators associated with the SDGs, to ensure that globally we understand the state of our sustainable development will require all NSOs to have the capabilities, structures, and processes that ensure sustainable production of a wide range of information now and into the future. Targeted staff development improves performance and productivity and supports staff to meet current and future requirements. The benefits for individual staff are manifold including more satisfaction with their current job as well as with future prospects, greater access to interesting work, and potentially increased responsibility.

The Statistical Training needs Assessment Tool (STAT) is intended to support NSOs in identifying, assessing and meeting development needs of the staff as well as integrating learning as a strategic focus by establishing an organizational anchored learning plan.

STAT focuses on all types of job functions including staff working in statistics production, IT, communication, management, finance, HR, and other administrative functions. Staff working with statistics production within the National Statistical System (NSS) can also be included in the assessment

STAT consists of three questionnaires to assess skills and knowledge among staff and managers at the NSO and, if possible, within the NSS (**Chapter 2**). The three questionnaires have the following aims:

1. to identify the current level of skill and priority for upskilling of staff in the NSO working in statistics production, IT, and dissemination of statistics as well as administrative support functions
2. to identify managers' understanding of institutional skills and high-priority training needs for the staff they directly manage now and in the future; and
3. to identify the current level of skill and priority for upskilling of staff working with statistics production, and supportive IT and dissemination areas in other authorities of the NSS.

The assessment can also be conducted among staff at local offices - if needed in an adjusted version. The tool offers recommendations on how to prioritize among learning needs (**Chapter 3**) and how to implement an institutional learning plan including which type of learning opportunities to offer keeping in mind that there are many ways that people like to learn, and it is not always optimal to offer face-to-face courses (**Chapter 4**).

Thinking strategically about learning might involve the development of a strategy for competence development (**Chapter 5**). An institutional learning plan does not have to include a statistics school or organized in a resources-intensive manner. A learning plan can be simple and iteratively developed over time, learning lessons as you go. A learning plan should be developed in a meaningful way within the specific cultural and organizational context, to have a sustainable process for ensuring that the organization can maintain the right capabilities to fulfill its functions and become a learning organization. Limited, targeted learning opportunities based on the needs of the organization and its staff are more effective than learning that is not targeted or more opportunistic. There are some questions included in the questionnaires to support conversations about barriers and enablers for becoming a learning organization (**Chapter 6**).

Establishing an institutional learning plan with motivated in-house trainers and learners might require some changes to the current way of working and suits a specific purpose within the landscape of supporting

upskilling within an organization. A set of recommendations on how to conduct facilitated training in-house is provided (**Chapter 7** and **Annex 2**).

While no single staff is expected to possess all of the skills listed in the assessment, staff will likely gain a broad range of skills over time. New staff needs to be inducted into the organization (**Chapter 8**). This often requires upskilling in a broad range of cultural, procedural as well as technical topics. For information that does not change frequently, it can be cost and time-effective to provision this through e-learning (**Annex 1**).

Understanding the skills required now and into the future by the organization and how this compares to the skills of the current staff can help both with the development of the institutional learning plan as well as when asking regional and international organizations to fill in any gaps.

The support of management is crucial for the success of an institutional learning plan. First, staff will need management support in acknowledging that learning takes time and that learning is considered a part of the job. Moreover, management often knows existing competencies but also the needs of tomorrow. In addition, management can play an active role in a dialogue with individual staff about his/her specific development needs thus supporting the staff in fulfilling their role and responsibilities.

Promoting a culture of planned training and learning, using more experienced staff to train others, and focusing on learning as a broad concept encompassing elements of creating a learning organization, could, in the long run, make the NSO as well as the NSS more self-sufficient in supplying the competence they need.

Use a stepwise approach to building a capable and sustainable NSO

1. Conduct a learning need assessment to identify skill levels and gaps among staff and managers - if needed also in local statistical offices and among staff within the National Statistical System.

2. Analyze the results of the assessment and prioritize among the most important learning needs.

3. If deemed necessary, develop a strategy for competency development that determines the learning objectives of the organization and how they support the organization reaching its goals.

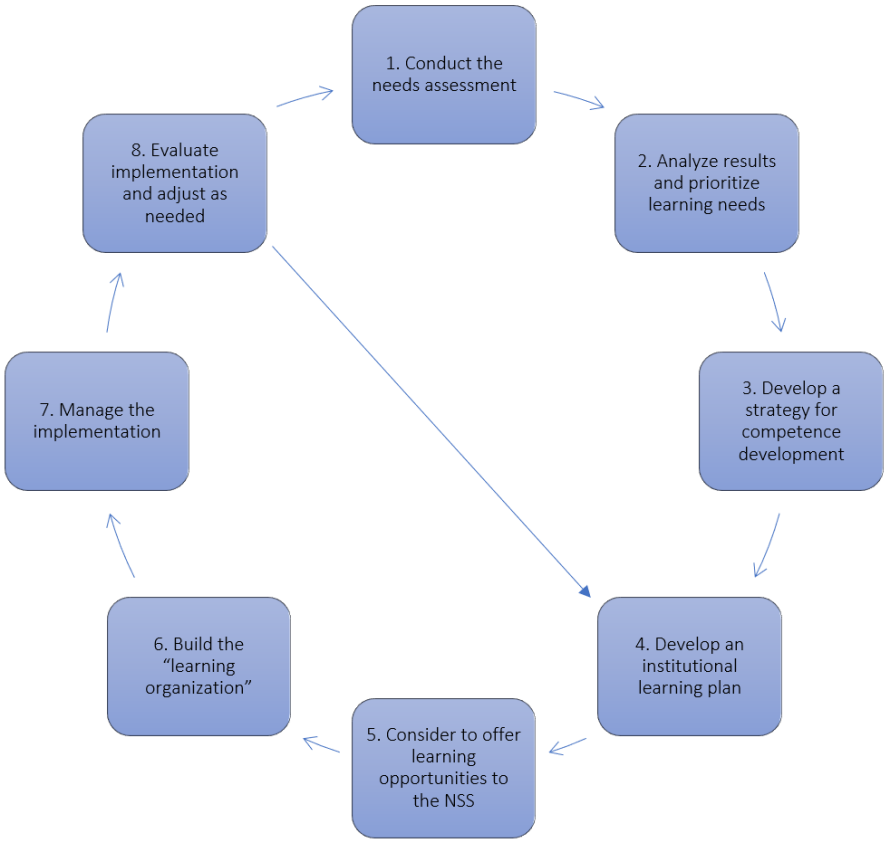
4. Develop an institutional learning plan with different types of learning approaches. Identify staff who can develop and conduct in-house training; identify already available e-learning courses; consider information learning, decide if external assistance is needed for some types of learning and plan for how to request external support etc.

5. Consider whether the learning is also relevant for staff at local offices and within the National Statistical System.

6. Start to build the "learning organization" where the learning culture promotes knowledge sharing, innovation, teams building etc. Expand the use of in-house expertise to train staff. Make sure that in-house trainers have sufficient time to develop new courses and materials as well as prepare for the course itself.

7. Set up a system to manage and keep track of the implementation of the strategy and the institutional learning plan.

8. Evaluate the implementation of the institutional learning plan and make updates as needed e.g. on an annual basis.



2. Identifying skills gaps and training needs

The tool consists of three questionnaires to identify and assess skill levels and learning needs:

2.1 NSO Individual Needs Assessment Questionnaire: A questionnaire for all staff including managers at the NSO to identify the individual level of knowledge and learning needs.

2.2 NSO Institutional Needs Assessment Questionnaire: A questionnaire for managers to identify gaps in their team's ability to perform current as well as future tasks. The questionnaire is intended to capture institutional needs based on priorities and strategies and expected future requirements.

2.3 NSS Needs Assessment Questionnaire: A questionnaire for staff working with statistics production at authorities within the national statistical system (i.e. ministries and other public institutions).

To access the questionnaires: The questionnaires are implemented in Google Forms. Please contact the GIST Secretariat at statistics@un.org and you will receive a clean copy of the three questionnaires. You can either use these forms or put the questions into another survey platform.

The questionnaires are flexible and can be customized: The questionnaires are developed to capture a wide range of different skills. Since skills requirements can vary from country to country, the questionnaires are designed to be flexible, and can thus be accustomed to meet the specific requirements of the country by deleting or adding skills or sub-sections in the questionnaires.

The forms are currently set not to collect email addresses, this means that staff will not be able to be identified, which research suggests means staff will be more honest in their responses. It does, however, mean that there is no way to filter out multiple responses from the same respondent. If you wish to collect email addresses, you may do so in the form settings.

The Survey Feedback section has questions designed to collect information about the respondent's experience with the form. You may wish to ask other questions pertinent to your organization in addition/instead, e.g. 'Any other comments about the learning program offered by the organization?'.

If you intend to use the R code files and Power BI, which STAT provides to analyze the data (see section 2.4 Analyzing the data), it is suggested that the categories of skills used in each of the questionnaires are spelled exactly the same and kept in a master list in Excel (the tool provides a list of master skills, which reflects the skills in the questionnaires). Further, if you decide to make changes to questionnaires, please remember that you have to adjust the R code files accordingly to match those changes.

Assessing learning needs in the local offices: If the NSO wants to assess skills and needs of staff working in the local offices, the NSO Individual Needs Assessment Questionnaire and the NSO Institutional Needs Assessment Questionnaire can be used and adjusted accordingly. E.g. if the local offices are only involved in data collection, only those relevant sub-sections should be kept in the questionnaire. It is recommended to add a question regarding the location of work differentiating staff at the NSO and staff at the local offices in order to identify their respective needs and introduce the needed skip logic so local office staff only answer questions on skills relevant to them. Alternatively, you can build a separate questionnaire for the local staff from the NSO Individual Needs Assessment Questionnaire.

Re-assess learning needs at regular intervals: The assessment can be conducted every other or third year depending on resources and is likely to need adaptation depending on the organizational goals and level of

capability in the organization at the time. Assessing gaps and learning needs relatively consistently will send the message to staff that their needs are an organizational priority.

Staff should be given sufficient time to fill in the questionnaire. It can also be a good idea to send out reminders, if possible, directed toward those who have not yet responded to the questionnaire.

2.1 NSO Individual Needs Assessment Questionnaire

The questionnaire for individual staff, including managers, seeks to identify the current level of knowledge and whether the staff needs to upgrade their skills. The first section of the questionnaire asks about the respondent's background as well as learning preferences[1]. Based on information about the respondent's current line of work, the respondent will be directed to a fixed skills catalog that is relevant to the specific type of work. There are different skills catalogs for staff in:

- Statistics production
- IT
- Communication and dissemination of statistics
- Finance
- Human resources
- Other administrative and secretarial function

If the respondent has managerial responsibilities, the respondent also needs to identify their level of knowledge and training needs related to management skills.

Everyone must fill in the last section related to personal and basic software skills as well as knowledge in understanding the statistics system in general.

The respondent has to identify whether each skill is relevant for their current job. The respondent must focus on what is relevant for the current job. The respondent will first answer "Yes" or "No" to the question: "Is this skill relevant for your current job?". If the skill is relevant, the respondent needs to identify the current level of knowledge using the following scale:

1. **No knowledge**: The person might have heard about the subject but know nothing or very little about the skill.
2. **Basic knowledge**: The person knows, recognizes, and can describe the skill. In practice, the person has been introduced to and might even have tried to test the skill either alone or under supervision.
3. **Intermediate knowledge**: The person can use the skill for their work at a sufficient level.
4. **Advanced knowledge**: The person uses the knowledge with ease and has a wide background on the topic. The person can also write guidance documents as well as support or teach others.

Once the respondent has identified the relevance of the skill and the current level of knowledge, the respondent needs to decide if s/he has a learning need. Some learning needs will be of high priority, while other learning needs are not a priority right now or a lower priority. Respondents are asked to carefully consider the level of priority when filling in the questionnaire to avoid making all learning needs a high priority. This information is important when the NSO has to decide on which areas of need to prioritize.

[1] See Chapter 6 on Creating a Learning Organization and how questions have been integrated into the questionnaire to facilitate this process.

An open-ended answer option is available at the end of the questionnaire to allow the respondent to suggest skills in which they need further development but were missing from the questionnaire.

Important: There are a few places in the questionnaire where your input is required before you launch the survey:

In the *Google Forms section 1* (introduction): Insert the name of your institution in the space [INSERT NAME OF NSO]

In the *Google Forms section 3* (information about the respondent): In question 3, insert the name of your institution in the space [INSERT NAME OF NSO]

In the *Google Forms section 3* (information about the respondent): In question 7, insert the term used in your institution to identify the units in the organizational structure (e.g. directorate, department or division) in the space [directorate/department/division]. Further, add the names of the units you want to appear in the questionnaire as options for the respondents to choose from. This information can be used to identify data for each unit and provide more concrete information to managers of those units on the responses of their staff.

In the *Google Forms section 15* (metadata and quality of statistics): In questions 6.1 and 6.2 in the first listed skill, decide whether you want to keep the reference to the United Nations Quality Assurance Framework or you want to refer to the NSO's own quality assurance framework/standard. Ensure that the skill is written exactly the same in both questions 6.1 and 6.2. Remember to update the corresponding skill name in the file *Final skills list.csv* (see more in Annex 3 on analyzing the data by using R and Power BI).

2.2 NSO Institutional Needs Assessment Questionnaire

This questionnaire seeks to identify institutional needs by asking managers to identify where they see gaps in their team's ability to perform current and future tasks and which high-priority learning needs their team has.

The first section of the questionnaire asks about the background of the manager and their opinion about learning within the organization[2]. Based on the current line of responsibility, which the manager has identified, the manager will be directed to the relevant skills catalogs. As managers can be responsible for staff in a different line of work, the manager can choose more than one category and can thus be directed to different skills catalogs. The staff categories are:

- Statistics production
- IT
- Communication and dissemination of statistics
- Finance
- Human resources
- Other administrative and secretarial function
- Management of managers

Finally, in the last section of the questionnaire, the manager answers questions about their team's personal and basic software skills as well as their knowledge in understanding the statistics system in general.

[2] See Chapter 6 on Creating a Learning Organization and how questions have been integrated into the questionnaire to facilitate this process.

To identify the gaps in knowledge, the manager should identify where they see gaps in their team's ability to perform current and future tasks. The manager is also asked to identify whether it is a priority to upgrade the skills of the staff to perform their work within the next two years. The manager is thus requested to prioritize those skills where needs are most urgent. Finally, the manager should identify approximately how many staff would need upskilling at basic, intermediate, or advanced levels based on their best assumption.

Important: There is one place in the questionnaire where your input is required before you launch the survey:

In the *Google Forms section 3* (information about the respondent): In question 1 insert the term used in your institution to identify the units in the organizational structure (e.g. directorate, department or division) in the space [directorate/department/division]. Further, add the names of the units you want to appear in the questionnaire as options for the respondents to choose from. Make sure that this information is exactly the same as you inserted in the NSO Individual Needs Assessment Questionnaire.

In the *Google Forms section 16* (metadata and quality of statistics): Decide whether you want to keep the reference to the United Nations Quality Assurance Framework or you want to refer to the NSO's own quality assurance framework/standard. Ensure that the skill is written exactly the same as in the NSO Individual Needs Assessment Questionnaire. Remember to update the corresponding skill name in the file *Final skills list.csv* (see more in Annex 3 on analyzing the data by using R and Power BI).

2.3 NSS Needs Assessment Questionnaire

This questionnaire seeks to identify the skill levels and learning needs of staff working with statistics production in other authorities within the NSS (i.e. ministries and other public institutions) as well as their institution's ability to handle IT and dissemination of statistics. Respondents are also asked about their learning preferences.

The first section of the questionnaire asks about the respondent's background. Next, the respondent will be taken to a skills catalog that lists skills under different headlines. Since this questionnaire is only for staff working with statistics production there are no skip logic based on the type of work. If the respondent also has a managerial role, the respondent will be asked to fill in an extra section on management skills.

The respondent has to identify whether each skill is relevant for their current job. The respondent must focus on what is relevant for the current job. The respondent will first answer "Yes" or "No" to the question: "Is this skill relevant for your current job?". If the skill is relevant, the respondent needs to identify the current level of knowledge using the following scale:

1. **No knowledge**: The person might have heard about the subject but know nothing or very little about the skill.
2. **Basic knowledge**: The person knows, recognizes, and can describe the skill. In practice, the person has been introduced to and might even have tried to test the skill either alone or under supervision.
3. **Intermediate knowledge**: The person can use the skill for their work at a sufficient level.
4. **Advanced knowledge**: The person uses the knowledge with ease and has a wide background on the topic. The person can also write guidance documents as well as support or teach others.

Once the respondent has identified the relevance of the skill and the current level of knowledge, the respondent needs to decide if s/he has a learning need. Some needs will be of high priority, while others are not a priority right now or a lower priority. The respondent should carefully consider the level of priority when filling in the questionnaire to avoid making all needs a high priority.

IT and dissemination of statistics are important elements of producing official statistics but might not be areas which the respondent is responsible for. Therefore, the respondent will be asked some questions about his/her institution's ability to handle IT related to producing statistics as well as communicating and publishing statistics.

Important: There are a few places in the questionnaire where your input is required before you launch the survey:

In the *Google Forms section 1* (introduction): Insert the name of the NSO in the space [INSERT NAME OF NSO HERE]

In the *Google Forms section 3* (information about the respondent): In the first question, insert the titles of the institutions within the NSS that you are sending the questionnaire to as answer options. For analysis purposes, this will make sure that respondents belonging to the same institutions are categorized as such.

In the *Google Forms section 15* (metadata and quality of statistics): In questions 6.1 and 6.2 in the first listed skill, decide whether you want to keep the reference to the United Nations Quality Assurance Framework or you want to refer to the NSO's own quality assurance framework/standard. Ensure that the skill is written exactly the same in both questions 6.1 and 6.2 and that it aligns with the text in the NSO Individual Needs Assessment Questionnaire and the NSO Institutional Needs Assessment Questionnaire. If you have not already done so, remember to update the corresponding skill name in the file *Final skills list.csv* (see more in Annex 3 on analyzing the data by using R and Power BI).

2.4 Analyzing the data

There are multiple ways of viewing and analyzing the data collected through the questionnaires.

Assuming Google Forms is used for the collection, there are different ways to analyze the responses. They are listed in order of ease of use (easier to harder) as well as the level of insights (fewer insights to greater insights) that you can get from the method.

2.4.1 Through the Google Forms interface

The simplest way to see the responses is through the 'Responses' tab in the online form of Google Forms. This provides a visual (usually pie charts or column charts) for each question asked in the questionnaire. It has hover over functionality and the ability to copy and paste each graphic, however, the visuals do not interact allowing for only question-level descriptive insights.

2.4.2 Through Google Sheets/Excel

On the 'Responses' tab in the browser interface, there is a button in the top right corner 'View in Sheets' which, when clicked will output the responses from the questionnaire to a Google Sheet (which can then be downloaded as a CSV, Excel or another format). This data can be consumed and used by any data analysis software and can also be analyzed within the spreadsheet software e.g. by creating heat maps.

This approach to analysis might be useful if the questionnaires are translated into a local language as STAT's analysis package (section 2.4.3 below) will no longer work. This occurs because the R scripts interact with Google Sheets using text, which would also need to be translated.

2.4.3 Through STAT's analysis package using a combination of Google Sheets, R, and Power BI

If you have expertise in R and Power BI within your organization (or enthusiasm and time to learn them), STAT provides a worked example of how Google Sheets, R, and Power BI can be used to create an interactive data visualization report. This report provides a user-friendly interface for further interrogation

of the data in a way that is interactive and provides drill-throughs. If this is of interest to you, please see Annex 3 for detailed instructions on how you might go about creating your own.

3. Prioritizing needs and determining the best way of meeting them

Deciding which learning needs to be prioritized and included in the NSO's institutional learning plan is not an easy task. If the NSO has implemented the needs assessment, the result will most likely show that staff have many different learning needs, and the challenge remains how to prioritize. The NSO would need to prioritize among those skills, which are most crucial and beneficial for the organization and possible within known resources. There are several priority considerations to take, and some considerations may conflict with each other.

3.1 Needs of many vs individual needs

Prioritize learning in skills in which many have expressed a need. The NSO can decide on a minimum number of staff that need to express a need to guide the priority setting. Depending on the size of the NSO, priority could be given to skills where e.g. at least 30 requests are made, especially if the need is common across departments within the organization.

When filling in the questionnaire, staff have most likely increased awareness of their own learning needs. This provides a good opportunity for managers to start a conversation with individual staff on their needs and whether some of those needs can be met by participating in e.g. free online e-learning at little cost to the organization. The use of e-learning can also make it easier to accommodate the needs that only one or a few staff members have.

3.2 Few staff lacking knowledge of key skills

There might be instances where only a few staff would need training in key skills highly prioritized by the NSO (and by the staff themselves). This could e.g. be calculating index numbers or a special statistical domain that the NSO needs to deliver on but where the current skills level is low. Prioritizing learning for only a few staff might come at the expense of a need made by a large group of staff (section 3.1) that in the bigger picture is considered a lower priority for the organization as a whole. Identifying the most crucial skills for the NSO is also something that the HR department and management could decide on together.

When upskilling is only needed for one or few staff, the NSO could consider asking for external support from regional and international institutions who already work with other countries or group up with other NSOs who might face a similar challenge and cooperate on developing a course (e.g. online) so people from multiple countries can participate at a lower cost for all.

3.3 High vs low-priority needs

Attention should be given to those skills, in which staff have indicated a high priority. This is a good starting point and is an overall guiding principle. However, be aware that there might be skills that receive low priority by staff but are considered a high priority by the organization. There might also be situations where only a few staff consider a certain skill a high priority but where it will be crucial for the organization to offer training for a large group of staff (section 3.4).

3.4 Individual vs management identified needs

It is important to listen to the needs identified by staff themselves as they often know their gaps and where they feel incapable of delivering. However, the NSO needs to balance the self-identified needs of staff with the institutional needs. The results of the NSO Institutional Needs Assessment Questionnaire will give information on the wider institutional needs and might also give a better idea of future requests and thus upcoming learning needs. This information is crucial for planning.

3.5 New and inexperienced vs experienced staff

The NSO needs to offer a minimum level of training for new staff. However, experienced staff will still have needs as they both move around the organization, take on new responsibilities, and need to be abreast of new ways of working with statistics.

The results of the NSO Individual Needs Assessment Questionnaire will give information on which needs new staff identify themselves. Once the NSO has a learning plan for new staff, it will be easier to follow through from year to year as the needs often will be the same (with smaller adjustments over time). See Chapter 8 for suggestions on a basic set of training courses for new staff incl. links to free e-learning.

3.6 Recurring vs new topics

The NSO might already have knowledge of which skills staff often ask to be trained in. These are also often skills, which can be considered core functions of the NSO. It is cost-effective to invest in developing in-house training materials on topics that are likely to be in demand year after year e.g. skills relevant to data analysis.

New subject areas such as data science or big data, may be an area where help can be sought from external experts. Perhaps search for online courses where staff can engage in self-paced studying complemented by in-house discussion groups.

3.7 Basic vs intermediate vs advanced knowledge levels

The needs assessment indicates both the current level of knowledge and the level of needs. Basic training should be offered to staff that have little or no knowledge; intermediate training should be given to those who have some experience but need to develop to a higher level; and advanced training should be offered to experienced staff who should function as super-users, people who upskill other staff, or play key roles in the organization.

Learning opportunities should be offered to only those who need it and will use it in their work within a short period following the upskilling. The NSO therefore needs to prioritize staff who need to advance to the next level over those who might be interested in training to fulfil their interest (although, with the right support this can be a way of increasing innovation within organizations). Managers play a role in identifying who needs training at which level.

If staff are at different levels but are provided with the same level of training, it can be considered to first bring those with fewer skills up to a level that makes it possible for them to benefit fully before training the others. This can e.g. be done by giving them introductory training, material to study, or access to e-learning. Coaching and job shadowing can also be useful in these circumstances, as well as creating opportunities for these staff to work together on projects.

3.8 Resources

Some learning approaches will be easier to set up, and less resource-demanding than others. It is e.g. often easier to set up a course with an in-house trainer than to fly in an international consultant. How costly and how much work it takes to organize a course is also an argument that ought to be considered when prioritizing learning options. Moving away from considering learning as face-to-face courses to a broad range of informal and formal learning approaches is something that will be presented in the next chapter.

3.9 Developing an Institutional Learning Plan

Involving staff from different parts of the organization in the prioritization process can be beneficial to ensure that all perspectives are considered. Staff representing different units can help clarify why some skills might be more important to prioritize over others. The organization can organize a workshop where the involved staff can review the results of the surveys and prioritize them by using the considerations mentioned above. Management should also be involved and will in the end make the final decision of which skills to be included in an institutional learning plan. During the workshop, the involved staff can also discuss how best to meet the training needs.

After the prioritization process, the organization can start developing an institutional learning plan that is based on a good understanding of the needs, management priorities, and available resources. The learning plan is also expected to support the implementation of a competence development strategy (See Chapter 5 on developing a learning strategy). Consider developing a rolling learning plan with objectives for three years supported by a plan for specific activities for one year. The plan can be evaluated once a year to make sure that the needs are still relevant and accommodate any new emerging needs.

The structure of a 3-year learning plan could include the following elements:

- Objectives for the three years
- Learning priorities for the period by year
- Expected results of learning
- Annual delivery approach
- Detailed plan of learning activities for the first year
- Description of the procedure for review and evaluation

The detailed annual learning plan could be structured along these elements:

- Define specific learning activities for the year
    - Indicate topic, learners, level of learning, intended learning outcome
- Decide on delivery mode, provider, focal point
- Define/confirm the length (period of learning & study hours)
- Timeline for both development/partnership and delivery of the learning
- Timeline for providers/trainers and learners
- Conduct a mid-term review to inform the next plan

Chapter 4 will present different learning approaches to be considered in the institutional learning plan.

4. Deciding on learning approaches[3]

Once the NSO has the list of priority needs and is developing the institutional learning plan, it has to decide how the needs can be met. The NSO therefore needs to consider which learning approaches are available and what are most suitable and possible.

Lack of funding is often a challenge to meet all needs. However, the NSO can develop a learning plan even with limited funds. E.g. start by offering a few courses before developing a complete full-scale learning plan. Offering a small amount of targeted training is better than doing nothing at all. Start small if needed, and get people engaged to help.

Face-to-face training has long been the preferred method of learning. However, offering e-learning expands the opportunities and is better than not having any learning opportunities at all. NSOs can prioritize face-to-face training when personal interaction is crucial for the learning outcome. It is also important to remember that upskilling staff is more than just offering courses. Learning also includes on-the-job training, participating in networks, reading relevant materials, etc. Below we provide more details on the different types of learning approaches available. Chapter 7 looks into how the NSO can conduct facilitated training in-house by using staff to train their colleagues.

4.1 Different types of learning approaches

Learning should be understood as a broad term including both informal and formal learning. Informal learning includes on-the-job training, mentoring, participation in networks, and reading, while formal learning includes facilitated (whether online or face-to-face) and self-facilitated training such as e-learning.

The majority of learning takes place while working, whereas informal and formal learning opportunities will make up a smaller share of the overall development of the individual. This is also called the 70:20:10 model which considers that 70% of learning comes from learning while working, 20 % of learning comes from informal learning, and 10 % comes from formal learning. Learning while working is an efficient and cost-effective type of learning and is a practical approach to improving competencies. The institutional learning plan will only include informal and formal learning as learning while working is something that happens when doing the job, experiencing hands-on, solving problems, getting feedback on performance, etc.

Informal learning has a lower degree of planning and organization and is a more unstructured and unofficial way of learning in an organization. Formal learning has a higher degree of planning and organization and is more structured with concrete learning objectives and maybe even testing.

4.1.1 Informal learning

Shadowing: Shadowing is a way where a staff "watches" over the shoulder of a more experienced staff and thereby learns while someone else is doing the job.

Mentoring: An experienced colleague can be identified as the "mentor" and help with questions and show how things are to be done. Feedback can be provided both verbally and in writing. Besides the learning element, mentoring is also a way to establish relations between staff.

Networks: Networks can be used to exchange ideas and experiences among colleagues and with people outside the organization. Networks can take all sorts of forms from physical meetings to online chat forums

[3] Some paragraphs are made with inspiration and text phrases from the GIST publications: "Sustainable statistical training programs at National Statistical Offices"; "Sustainable organization of statistical training programs" and "Introducing e-learning in National Statistical Offices"

to book/journal clubs. Internal networks can be established among colleagues using similar tools or having similar interests and tasks e.g. managers. External networks can be national networks established for different purposes (e.g. within the NSS or branch organizations) or global networks on statistics where staff can be formally appointed or join more informal groups. Examples of online global networks are "The Stata Forum"[4] and the "Global Network of Data Officers and Statisticians" based on Yammar[5], while a regional-based network exists among the Nordic NSOs across all statistics domains where staff take the lead in contacting colleagues in the other Nordic NSOs if they have questions to ask.

Knowledge sharing: Creating an environment where staff are encouraged and feel comfortable with sharing knowledge is a key element in learning. This could include an environment where staff are expected to impart knowledge to one another, and particularly those that have expertise could be supported to share their knowledge broadly. Knowledge sharing can take many forms such as brown bag lunches where a unit shares knowledge on a method or statistics that they are working on, sharing information across silos, sharing information on the intranet, reading each other's papers, etc.

Reading: Taking the time to read a new manual, publications, relevant journals, and other articles supporting the development of a skill is another type of informal learning. Staff should be given time within their working hours to read relevant materials.

Search online: Sometimes staff can also find answers to practical questions by searching for answers on the intranet and internet e.g. watching a short YouTube video about a formula in Excel.

4.1.2 Formal learning

Formal learning has for many years taken the form of face-to-face courses, however, the availability of e-learning of which many are free, provides great learning opportunities. Which type of learning method to use depends on the learning objective and to which extent there needs to be a close interaction between the trainer and the learners. E.g. if the learner needs to learn how to perform in front of others, face-to-face learning might be preferred. The choice of free e-learning might be a natural choice if the budget is low.

Facilitated training: Facilitated training, whether online or face-to-face, is training where a trainer trains and supports learners. Facilitated training is suitable for courses where interaction between trainer and learners is needed. This type of learning can also be combined with self-paced training, e.g. by giving the learner access to an online course, a video lecture, or a text to read before the training, allowing for discussions and asking questions.

When developing and conducting facilitated training, the course must be adapted to what learners already know and to the level they need to reach. Courses are often divided into basic, intermediate, and advanced levels. If the trainer is trying to speak to too many different levels during the same course, training is often not efficient, and learners might get frustrated.

For courses to be effective, use the available expertise within the organization. Internal trainers can adapt training to fit the work processes and systems used in the organization better than an external trainer. Internal trainers are often more easily available, and cheaper to use, and being a trainer can also be motivating and build confidence, and subsequently strengthen the learning potential of the organization –

[4] https://www.statalist.org/
[5] https://www.un.org/en/desa/new-network-connecting-experts-produce-and-use-better-data-sdgs

see Chapter 7 for advice on how to conduct facilitated training with internal trainers. Skilled staff or super-users can train others, and learning teams can be established to enhance professional development.

Combining different learning methods, also known as blended learning, can help learners learn in different ways. Blended learning can include giving learners materials to prepare before a course, creating discussion groups, solving assignments, holding presentations, participating in quizzes, and clarifying questions.

- ***Face-to-face training*:** Face-to-face training is training taking place in a physical "classroom". Face-to-face training is for some staff the preferred modality and it does have many advantages as the trainer and learners can discuss face-to-face and interact in a more dynamic way than online.

  When planning for face-to-face training, it is worth considering using meeting venues or other available rooms at the NSO to keep costs low. Alternatively, venues might be available for free within the NSS especially if staff from other statistics producing authorities are invited to take part in the training. Holding face-to-face courses in conference rooms or hotels will increase the cost considerably.

- ***Online training***: Online training is facilitated training where the "classroom" is an online platform such as Zoom or Teams. The advantage of online training is that it does not require a physical (and costly) venue and that learners can be located at different locations. This type of learning can thus be used where staff from both the central and local offices need to be present.

Self-paced training: Self-paced training allows the learner to train at his or her own convenience and does not require a trainer. Self-paced training includes both free or paid e-learning, incl. massive open online courses (MOOC) and recorded lectures.

- **E-learning**: E-learning, incl. MOOCs, have become a big source of learning and are available to anyone with internet access. Many e-learning courses are free of charge or require only a small fee if the learner wants a certificate. See Annex 1 for links to e-learning platforms. The advantage of e-learning is that learners can take the course whenever they want and at their own pace. A disadvantage is that it has no or very little room for interaction with a trainer. Likewise, it can be challenging for the learner to clarify what he or she does not understand. Learners dropping out before the e-learning course is completed is also a risk.

  The NSO can develop its organization-specific e-learning. Though it requires an investment to produce, e-learning has the potential to reach many learners in the future and recoup the investment made. It is also convenient if the learner needs to refresh what is learned.

  Supplying staff with sufficient web connectivity, computers, time, and opportunity will enable staff to access e-learning. If these needs are not satisfied, staff will not make use of online training.

- **Recorded lectures**: A common form of self-paced learning is recorded lectures. Videos can be recorded from an ordinary lecture, and hence come at a low cost. Recorded lectures can be made available for new learners, or course participants who want to see it again. Recorded lectures have some of the same advantages and disadvantages as e-learning.

Facilitated support: The NSO can establish facilitated support to adjust for the lack of facilitated learning when using self-paced training. E.g. if more than one staff participates in e-learning, an in-house facilitator can be connected to a group of learners who could meet at regular intervals to engage in discussions, clarify questions and even do assignments. Facilitators do not need to be experts in the content, anyone with some knowledge of the topic can take on this role.

Discussion groups: The NSO can also establish a discussion group or a so-called "learning team" for those staff who participate in the same e-learning, so they can support each other's learning and development. The aim is to create an arena where the relevant staff can present challenges and is supported in finding solutions by the rest of the group.

4.2 Training staff at local offices and within the National Statistical System

If the NSO conducts a needs assessment among local office staff and staff working with statistics production in other authorities within the NSS, the NSO must be prepared to offer training or at least provide instructions on where they can find relevant training incl. free e-learning. If the learning plan for new staff includes a list of free e-learning this is also something that could easily be shared with the local offices and the authorities within the NSS.

- **Specific for local offices**: If the NSO conducts in-house training, consider giving some of the seats to staff in local offices. Local office staff might also need specialized learning opportunities as they are involved in very specific tasks different from the main office. If the cost is too high to gather relevant staff from the local offices at the same location, the NSO can consider training them online.

- **Specific for the NSS**: Authorities within the NSS might use different production processes, classifications, and IT systems than those used in the NSO. Conducting joint training for both NSO and NSS staff could offer an opportunity to discuss these differences and help the process of streamlining where needed. If the NSO conducts in-house training, consider giving some of the seats to staff within the NSS. Inviting staff from the NSS can also help create better coordination and cooperation as staff from the NSO and NSS get to know each other, which can be particularly important for data integration/administrative data collection. It might be worth considering the benefits of offering tailor-made courses to NSS staff as the statistical capacity and skills in NSS are sometimes limited. Be aware that offering training to NSS staff often greatly expands the number of people to be trained, so the potential impact on planning and delivery should be considered.

4.3 Asking for external support

Once the NSO has developed an institutional learning plan, the NSO will have a better overview of which learning is considered a high priority but neither the institution nor free sources can deliver. Asking bilateral partners or international and regional organizations for support might be easier and more targeted knowing what learning is required.

5. Developing a Strategy for Competence Development

Thinking more strategically about learning might involve developing a strategy. A strategy for competence development could help commit staff and managers to implement the institutional learning plan and provide more clarity to all on how learning will be implemented. A strategy could also include key principles that the NSO wants to strive towards such as:

- Improving knowledge sharing within the organization by moving away from knowledge is power to the power of sharing.
- Building a learning culture where learning is an integrated part of work. See Chapter 6 for creating a learning culture.
- Promote the use of internal human resources where experienced staff trains other colleagues or where young staff is seen as a resource and encouraged to train others.
- Broaden the use of different learning approaches so staff learn in different ways and benefit from the range of approaches available such as shadowing, mentoring, networking, reading manuals, e-learning, and of course face-to-face learning (see Chapter 4 on Learning approaches and implementation of an institutional learning plan).

A strategy can be designed in many different ways. Below we provide some input on the possible content of a strategy:

Objectives

What is the objective of the strategy? E.g. increased competency of staff to deliver productively and efficiently, staff are better equipped to handle changes, facilitation of retention, promote a culture of learning and knowledge sharing

Approach to learning

Which type of learning approach does the NSO seek to promote? Is there a focus on the 70:20:10 model of learning? Will the organization promote the use of in-house trainers to reduce costs and benefit from in-house knowledge? How can we have people change and share their knowledge? Or do we achieve the objectives?

Commitment to implementation

General for the institution: E.g. timeliness of learning, regular review of the institutional learning plan to keep it relevant to staff and the organization

Management: E.g. allocate time to participate in learning activities, reward for taking on roles like training others and managing discussion groups, allocate funding, and link learning to business goals of the organization

Staff: E.g. willing to share knowledge with others both formally and informally, providing an effort to implement new skills

Obstacles to implementation

What are the obstacles to achieving the objectives in the strategy and how can the obstacles be mitigated?

6. Creating a Learning Organization

Fostering a learning organization is a way of creating a culture that encourages and supports continuous learning, innovation, and improvement among staff and teams. A learning organization values the knowledge and skills of its members and provides them with opportunities to grow and develop – also preparing the organisation for skills required in the future. Organizational learning is the process by which an organization improves itself over time through gaining experience and using that experience to create knowledge. The knowledge created is transferred within the organization.

Some of the benefits of fostering a learning organization are:

- Increased staff satisfaction and retention: By creating an environment where they are constantly learning, staff feel that the organization values them and their personal growth. This leads to increased engagement and dedication[6].
- Improved performance and productivity: By allowing staff to share new ideas and feedback on business processes, organizations can achieve continuous improvement and efficiency[7][8].
- Enhanced adaptability and innovation: By promoting a culture of experimentation and risk-taking, organizations can quickly respond to changing demands from society and user needs. Staff might also develop a mindset of creativity and problem-solving[9][10].
- Business longevity and competitiveness: By investing in the learning and development of its staff, organizations can build a strong and loyal workforce that can drive business success and growth. Staff can also become leaders and change agents that can influence the organization[11][12].

Being a learning organization is particularly important in limited-resource environments, and in industries where there are rapid advancements in technology to consider, such as in producing official statistics.

There are multiple questionnaires[13] [14] [15] that allow organizations to understand to what extent their organization is a learning organization. The STAT questionnaires include questions on the Learning Organization at the end of the 3rd section to support conversations around some of the aspects of what it takes to be a learning organization. It is also supporting a possible conversation between management and staff if perceptions differ between these two groups. The questions are adapted from the questionnaires referenced above as well as adding our own based on the recommendations from the Asian Development Bank's paper Building a Learning Organization[16].

In the NSO Individual Needs Assessment, staff are asked about how effectively they find different learning styles to guide the NSO in understanding how staff prefers to learn and where new types of learning approaches should be encouraged. Staff are also asked about their attitude towards learning such as how

[6] What Is Organizational Learning and Why it's Important? - Valamis
[7] Why a learning culture is vital for success in your organization
[8] The Benefits Of A Learning Organization Culture - Bloomfire
[9] Four Positive Effects Of Fostering A Learning Organization - Forbes
[10] The Importance of a Learning Organization | GetSmarter Blog
[11] Why a learning culture is vital for success in your organization
[12] The Importance of a Learning Organization | GetSmarter Blog
[13] Is Yours a Learning Organization? (hbr.org)
[14] Learning and skills at work survey 2021 (cipd.org)
[15] Becoming a learning organization while enhancing performance: the case of LEGO | Emerald Insight
[16] Building a Learning Organization (adb.org)

problems are seen as an opportunity to learn, how they discuss challenges with colleagues to learn from them, and how they help others to learn.

In the NSO Institutional Needs Assessment, managers are likewise asked how effectively they find different learning styles. They are also asked about their opinion on different statements on learning such as whether the organization supports them in discussing performance and development needs with their staff and if the organization supports them in encouraging experimentation within their team, not blaming staff if the experiment did not work.

In the NSS Needs Assessment, respondents are asked how effectively they find different learning styles.

Focusing on ensuring staff have the skills to support their own learning and that of each other will ensure that NSOs can be sustainable in their upskilling.

7. Planning and conducting facilitated in-house training[17]

This chapter will provide advice on how to plan and conduct facilitated training in-house i.e. face-to-face or online training with the use of an internal trainer.

7.1 When to conduct facilitated training

Plan training: Facilitated training can be conducted during the entire year like any other type of learning. Plan training during periods where work is less intense, and particularly in time for delivery of goals that require these skills. It is also a good idea to plan the training well in advance so staff can plan their work around the expected training dates.

Flexible days: If training is expected to take more than one day, consider extending the training over a period with normal working days in between training days to give staff time to work on their regular task, digest their new knowledge, and review training materials, do assignments and other preparatory work. Half training days is also an option, e.g. so staff are trained in the morning and can work in the afternoon.

7.2 How trainers and learners can be motivated and recruited

Ensure management support: High-level management must be supportive of staff prioritizing learning and devoting the time needed. Integrating learning as part of the ordinary tasks of staff may facilitate this process. If giving and attending learning activities is something that has to be done in addition to other tasks, it may not receive the needed attention.

Train during working hours: Learning is a normal part of work and should in principle take place during working hours. Participation in learning activities during working hours might also give staff with caring responsibilities (often females) better opportunities to benefit. Both learners and in-house trainers need to set aside time for learning and be able and willing to prioritize it over other tasks.

Allow appropriate time to develop and participate in learning: Developing learning activities may take a substantial amount of time. Even though developing and giving training is generally considered to take more time than participating, participants also need time to take part in lectures, review the training material and prepare assignments, and engage in practical application of the new skills on the job.

7.2.1 In-house trainers

Using staff as trainers has many advantages as it strengthens the self-sufficiency of the organization, provides development opportunities for staff, and targets training to the specific needs of the organization.

Building a culture where staff are motivated to train others: Trainers need to be empowered in their role as trainers. This can be done by giving them visibility and allowing them to cooperate with and learn from colleagues. Trainers may increase their network, promote themselves internally, gain new insight, and develop themselves. In a more virtual modality, trainers can expand their work to other countries and strengthen their participation in an international community easier than before. Moreover, trainers must be convinced that sharing knowledge is more likely to strengthen than weaken their position in the organization. It is thus crucial to build a culture where people want to engage in training others.

[17] This Chapter is drafted with inspiration from the GIST publications: “Sustainable statistical training programs at National Statistical Offices”; “Sustainable organization of statistical training programs” and “Introducing e-learning in National Statistical Offices”

Train trainers: Trainers need to be confident in their role, as it may be difficult to be the teacher of your colleagues. They would often need training in how to facilitate and conduct successful courses. Participating in "Training of trainer programs" where trainers learn presentation and facilitation techniques may be a motivation in itself. The trainer needs to know how to deliver interestingly, articulate key issues, and bring out the best in the learners. Starting small, e.g. facilitating something within your own team with a few staff for a short period, e.g. a showcase on what you have done, and then getting feedback from those attending on what went well and what could be improved, and then slowly increasing the size of the audience, incorporating people from outside your work area and running longer sessions can also be an approach to build confidence and knowledge on future trainers.

Trainers support each other: Having more than one trainer being able to deliver a course is part of making learning sustainable. Having one or two assistant trainers increases the possibility someone will be able to teach the course when the original trainer is no longer available. Besides, being the sole trainer is also a heavy task, especially for longer courses, so having co-trainers to support will often be considered an advantage. Co-trainers can also provide valuable feedback to main trainers on the content and delivery.

Consider payment for additional burden: If preparing and conducting training represents a significant burden to the trainer and there is no space in their current work program, additional payment is justified.

7.2.2 External trainers

It might be necessary to use external trainers in cases where knowledge is not available in-house, and there is low confidence in being able to efficiently acquire that knowledge from online sources. When using an external trainer, consider organizing the course as a "training of trainers", so that possible in-house trainers can be trained for the future. An external trainer should thus conduct the course with the help of an in-house assistant trainer who participates in the preparation of the course and acts as an assistant trainer. When the course is repeated, the assistant trainer can take responsibility for the course. When the assistant becomes the main trainer, he or she should take on a new assistant trainer.

7.2.3 Learners

Finding the right learners – without economic motives: Choosing the right learners improves the impact of learning. Staff that need to be trained are those who will apply the new skills in their work. Financial motivation (by paying a sitting allowance or participation fee) might motivate others than the right learners. In contrast, inner motivation is crucial and should be promoted. Management should therefore promote a culture of learning and encourage staff to develop their skills by incentivizing participation in learning activities without economic means. Participating in learning activities at the ordinary place of work and integrating it as an ordinary task, may facilitate this process.

Designing interesting courses: The design of a course also influences the motivation of learners. This includes how the content is structured incl. using a mix of teaching methods, how learning material is presented, and how interaction and activities are held. Using local, real-life examples can help to ground the concepts in practical application. Ensuring that the course aligns with the learning needs of the audience is key. Utilizing flipped learning, where learners gain knowledge before the course and the face-to-face time is used to discuss and work through challenges can be very effective in engaging participants. Being clear on what the successful learner will gain through attending the course can also ensure that only those who need the course sign up.

Develop careers: Learning can be linked to career development by providing the staff with new and relevant tasks that can lead to other interesting tasks and positions within the organization. Enabling staff to achieve mastery in their current role can also help with staff retention.

Decide on the learners' profile: Each course should have a description of the characteristics of who should take the course, including pre-requisite knowledge and skills. This description can also be used if there are too many applicants, and the NSO has to choose some participants over others on how well they meet the set characteristics.

7.3 Recommendations on how to plan and conduct a course

Train trainers in presentation and facilitation techniques: Giving successful courses does not only depend on having the relevant expertise, but also on facilitating it in a way where learners can interact, relate to the material, and apply it later in their work. Staff who will work as trainers will often need to train themselves on presentation and facilitation techniques.

Develop the course thoughtfully: When developing a course, you want to be clear on the learning objectives, the lesson plan, the content, the mode of delivery, how you implement it, etc. The ADDIE model[18] (Analyse, Design, Develop, Implement, Evaluate) provides an overview of the different steps and considerations to go through to ensure that the course is designed to meet trainers' and learners' expectations and needs.

Use a mix of teaching methods: Use a mix of teaching methods such as presentations, exercises, quizzes, discussion groups, and Q&A sessions. This way the learners will learn the topics in different ways. Repetition is helpful for learners especially when the knowledge is presented in different ways. See Annex 2 for an example of an agenda with a mix of teaching methods. Learners learn in different ways with some preferring visuals, while others learn better with teaching being more auditive, tactile or physical. Using diverse teaching methods is a means to increase different types of learners' understanding of what is being taught.

Give breaks and respect the time: Make sure to plan for breaks during the course. It is difficult for both learners and trainers to concentrate for longer periods. Breaks can sometimes be conducted as "energizers" to give learners new energy and a good laugh. Ideas for energizers can easily be found on the internet. Respect the starting and ending times provided in the agenda. People might have other plans and are not able to stay 30 minutes longer. The trainer therefore needs to adjust the agenda on an ongoing basis to make sure that the course finishes as planned.

Presentations should be clear and not full of text: Presentations (or lectures) should not be too long, and the slides, which might support a presentation should not be too crowded with text. Ideally, slides should give main points and not long sections of text. Use images to appeal to the more visual learners and to reinforce the main concepts. Also, make sure that the font size is big enough for people sitting in the back of the room. Darker font colors are preferred, especially if the projector is not working well.

Use the right venue: If a physical course is conducted, make sure that there is a good balance between the size of the venue and the number of people. If the venue is big, make sure that people in the back can hear and see what is going on at the front. Also, consider if there is a need for additional rooms for group work.

Prepare the practicalities: Make sure that all practicalities are in place. For physical meetings, do learners need access to computers, are flip-over/white-board needed, what about post-its and pens, and are print-outs needed for conducting exercises? It may be useful to have administrative support to help with the organizational elements of conducting a course.

[18] There are many sources on the internet providing details about ADDIE.

7.4 Evaluation of courses

All courses should be evaluated to improve them. An evaluation should be planned from the beginning and take place immediately after the course ends. An evaluation might ask the learner questions about the quality of prepared materials, presentation techniques, the usefulness of exercises, and the quality of interaction between trainer and learners.

Trainers should receive the results of the evaluation so they can learn and adjust their course. An evaluation of the impact of the training can be conducted 6-12 months after the course. However, it poses a logistic challenge to keep track of training periods and learners. For more information about how to conduct evaluation, please consult the paper "An introduction to evaluation of statistical training courses"[19] available on GIST's website.

[19] https://unstats.un.org/gist/resources/documents/Evaluation-guidance-doc-GIST-AM.pdf

8. Training new staff[20]

Newly recruited staff can be trained in the basics of official statistics, data analysis, data presentation, dissemination techniques, and the organization and administrative procedures of the NSO. Preferably, new staff should receive training within the first year and should be given the time needed during working hours to engage in learning activities whether informal or formal. Though new staff have a lot to learn in the beginning, they also bring valuable knowledge to the organization.

8.1 Topics relevant to new staff

New staff would normally need training in the following topics:

A. Fundamental aspects of the NSO and the NSS

A.1 Understanding the NSO and the NSS

- Role of the NSO and how it leads the NSS
- Legal framework for statistics
- National statistical development strategy/plan and multi-year/annual work plan
- NSO vision, policy agenda, communication style, and code of conduct
- NSO organization and responsibilities of different departments/divisions
- Data confidentiality, privacy, and security
- Introduction to the Sustainable Development Goals indicators
- Administrative procedures of the NSO

A.2 Quality of statistics

- Introduction to UN Fundamental Principles of Official Statistics and UN National Quality Assurance Framework (UNQAF)
- Introduction to any national quality framework chosen by the NSO e.g. the Generic Statistical Business Process Model (GSBPM)

B. Skills for new staff working with statistics

B.1 Cross-cutting topics relevant to all statisticians

- Fundamental principles of producing statistics
- Basic data analysis techniques, including disaggregation by age and sex
- Basic presentation and dissemination techniques
- Use of data for policy-making

B.2. Topics specific to the specialization of the statistician

- Understanding the statistical domain
- Data collection and data analysis
- Classifications, international standards, and nomenclatures
- Fundamental documentation, methodological documents, and reference materials
- Software training (software used by NSO and relevant for staff)

[20] This Chapter is drafted with inspiration from the GIST publication: “Recommendations for an NSO Standard Training Curriculum”.

8.2 Learning plan for new staff based on e-learning

If the NSO has limited resources to develop training materials, use free e-learning to train new staff. As a minimum, however, the NSO should have a presentation or document for new staff on some of the NSO-specific issues mentioned in "A.1 Understanding the NSO and the NSS". E-learning can also be combined with facilitated discussion groups once a group of new staff has completed one or more courses and read required documents to allow for questions and application in the organization.

Below is a suggestion for some free e-learning courses to help onboard new staff. The self-paced courses below cover many aspects of the topics above, in particular under sections A.1, A.2, and B.1.

Topics	Key words	Provider	Link
What is official statistics; UN Fundamental Principles of Official Statistics; organizational set-ups of the NSS and coordination within; the use of strategic planning; involvement of users; GSBPM/GAMSO	Official statistics; NSS; strategic planning; quality of statistics; GSBPM	UNITAR	https://www.unsdglearn.org/courses/introduction-to-data-governance-for-monitoring-the-sdgs/
Interpretation, analysis, and presentation of data; traditional and non-traditional data sources and their uses, opportunities and challenges; role of data in evidence-based policy making; interpreting and assessing the fitness for purpose of data and communicating with data tables, graphs and maps; understanding various data sources and data analysis techniques; use of data in policy formulation and monitoring and evaluation	Data sources; data analysis; presentation of data	UNITAR	https://www.unsdglearn.org/courses/understanding-data-and-statistics-better-for-more-effective-sdg-decision-making/
Module 4: Statistical standards; classifications; survey methodologies; statistical registers; dissemination Module 5: Role of statistics for the SDGs; compiling and monitoring SDG indicators	Module 4: Standards; survey methodology; statistical registers; dissemination Module 5: SDGs	UN SIAP	"Module 4: Measurement Standards of Official Statistics" and "Module 5: Official Statistics Useful for SDGs" https://www.unsiap.or.jp/on_line/FOS/OS_SDG.html
Identifying and engaging with users; increasing use and impact of data in decision-making	User needs and engagement	UN Big Data Learning / UNSD	https://www.unsdglearn.org/courses/increasing-user-engagement-around-data-and-statistics/
Data quality; UN national quality assurance framework and guidelines for its implementation	Quality of statistics	UN Big Data Learning / UNSD	https://learning.officialstatistics.org/enrol/index.php?id=74

Annex 1: List of online platforms offering e-learning

E-learning platforms with primary focus on statistics

UN SDG:Learn: https://statistics.unsdglearn.org/learning/
Hub for a wide range of e-learning in statistics – some with direct link to SDG indicators.
Type of courses: Self-paced e-learning; microlearning; facilitated online courses
Languages: English, French, Spanish – differ from course to course

United Nations Statistics Division: https://learning.officialstatistics.org/
Big data, energy statistics, SEEA, demographic statistics, SDGs, national accounts, user engagement
Type of courses: Self-paced e-learning
Languages: English, sometimes Russian and Arabic

United Nations Statistical Institute for Asia and the Pacific (SIAP): https://siap-elearning.org/
Official statistics; economic, social, agriculture, environment statistics; SDGs; statistical methodology
Type of courses: Facilitated and self-paced e-learning
Languages: English, a few in French, Spanish and Russian

CARICOM Learning Platform (e-CISTAR): https://ecistar.org/learning/
Various topics on statistics
Type of courses: Self-paced e-learning; facilitated online courses
Languages: English

European Master in Official Statistics (EMOS) webinars: https://www.emos-events.com/
Various topics on statistics
Type of courses: Webinars or recorded lectures
Languages: English

Paris21 Academy: https://academy.paris21.org/en/list
Planning, gender, dynamic presentation of data and trust in data
Type of courses: Self-paced e-learning; webinars; talks; podcasts
Languages: English

Rice University/University of Houston Clear Lake/Tufts University:https://onlinestatbook.com/2/index.html
Statistics methodologies: "Online Statistics Education: An Interactive Multimedia Course of Study"
Type of courses: Self-paced e-learning
Languages: English

ESRI Academy: http://www.esri.com/training/catalog/search/
Geographic information system (GIS)
Type of courses: Self-paced e-learning
Languages: English

U.S. Census Bureau: https://www.census.gov/programs-surveys/international-programs/events/training/e-learning.html
Various topics related to census, demography and gender analysis
Type of courses: Self-paced e-learning
Languages: English

UN Women and SIAP: https://data.unwomen.org/resources/gender-statistics-training-curriculum
Gender statistics
Type of course: Self-paced e-learning
Languages: English

E-learning platforms with focus on different topics incl. statistics

United Nations Institute for Training and Research (UNITAR): https://www.unitar.org/
Some courses on statistics
Type of courses: Self-paced e-learning
Languages: English

African Institute for Economic Development and Planning (IDEP):
https://knowledge.uneca.org/idep/online-course-0
Some courses on statistics but more courses on socioeconomic development
Type of courses: Self-paced e-learning; facilitated online courses
Languages: English, French, Portuguese – differ from course to course

Economic Commission for Latin America and the Caribbean (ECLAC): www.cepal.org/en/training
Courses on various topics, some on statistics
Type of courses: Facilitated online courses (fee-based)
Languages: Spanish, Portuguese

Escola Nacional de Administração Pública (ENAP) in Brazil: https://www.escolavirtual.gov.br/catalogo
Courses on public management, ethics, teaching, IT and many other topics
Type of courses: Self-paced e-learning
Languages: Portuguese

Open Learning Campus of the World Bank Group: olc.worldbank.org/
Courses, webinars and documents on many non-statistics related topics. Search for statistics content which include Civil Registration and Vital Statistics (CRVS)
Type of courses: Self-paced e-learning; recorded lectures; written notes etc.
Languages: English, sometimes Spanish

Massive Open Online Courses (MOOC)

MOOC are available in large numbers. Some MOOCs are self-paced while others are facilitated. Some has a small fee if the learner wants a certificate of completion.

The Class Central: www.classcentral.com/subjects
Courses grouped under e.g. “Statistics and probability”, “Data science” “Social sciences”, “Mathematics”
Languages: English

Coursera: www.coursera.org/
Portal offering courses on a wide range of topics, including statistics, data and computer science, languages, soft skills. Includes courses in R, Python and other programming languages.
Languages: English

edX: www.edx.org/search?tab=course
Courses available from universities and organizations, including on data analysis and statistics, social science, soft skills, language and computer science. Also, R, Python and other programming languages.
Languages: English

Khan Academy: www.khanacademy.org/math/statistics-probability
E-learning on different levels from primary education to college. Courses in statistics and probability
Languages: English

Udemy and **Udacity**: www.udemy.com/ and www.udacity.com/
Mostly courses with a fee, however it is fairly low
Languages: English

My-MOOC: https://www.my-mooc.com/fr/ (French); www.my-mooc.com/en/ (English)
E-learning courses
Languages: English and English

OpenClassrooms: https://openclassrooms.com/fr/ (French); https://openclassrooms.com/en/ (English)
Courses in e.g. IT and digital skills. All courses are conducted online, through video resources, online reading, projects and individual mentoring
Languages: English and French

Fun MOOC: https://www.fun-mooc.fr/fr/ (French); https://www.fun-mooc.fr/en/ (English)
Courses on many different topics
Languages: French and English

Veduca: https://veduca.org/
Brazilian e-learning portal
Languages: Portuguese

British Council & **BBC**: https://learnenglish.britishcouncil.org/ & https://www.bbc.co.uk/learningenglish
Training in English for foreigners
Languages: English

Annex 2: Example of an agenda using different teaching methods

Below is an example on how to mix different teaching methods in a two-day course. There is not one solution to organizing an agenda, and the agenda should always be adjusted to fit the specific learning objectives. When developing the agenda give each presentation and exercise a title. Learners only need the agenda in headline format, while the trainer needs a detailed agenda to remember how to proceed and apply the different methods. Preparing the methods is a key task when developing a course.

Before-and-after teaching methods could also be introduced by giving the participants material before the course (e.g. written material, or a video on what the course is about) or support after the course (e.g. facilitated groups to solve problems participants encounter using the new knowledge). The agenda suggested below does however only focus on the days of the course.

Day 1	**Title of agenda item**	***Instructions for trainer***
9:00 – 9:15	Welcome and introduction to the course	*The trainer welcomes learners and presents the programme for the course*
9:15 – 9:45	Introduction of participants	*Both the trainer/s and learners need to get to know each other. Decide on an appropriate approach*
9:45 – 10:15	Discussion of learners' expectations of the course	*E.g. all learners write their expectations for the course on a Post-it and put them on the wall. The trainer can read some of the expectations.* *Ask participants to reflect on how the skills can be used during the training and tell them that at the end of the course, you are going to ask them to inform how they are going to use the new skills.*
10:15 – 11:00	Presentation 1	*Presentation by trainer*
11:00 – 11:30	*Break*	
11:30 – 12:15	Exercise	*Case study where learners work in groups Discussion of case studies in plenary*
12:15 – 13.00	Presentation 2	*Presentation by trainer*
12:00 – 13:00	Exercise	*Case study where learners work in groups* *Discussion of case studies in plenary*
13:00 – 14:00	*Lunch*	
14.00 – 14.10	Energizer	*Use an energizer to get some energy back in the group after lunch.* *Have a few extra energizers planned to use if the participants get tired during the course.*
14:10 – 14:35	Presentation 3	*Presentation by trainer*
14:35 – 14:55	Quiz	*Use Kahoot!, Slido or something else to prepare a quiz with 6-10 questions on topics covered until now*
14:55 – 15:15	*Break*	
15:15 – 15:45	Exercise	*Learners discuss a set of questions in smaller groups. Trainer walks around, listens, and contributes*
15:45 – 16:00	Overview of programme for tomorrow	*Brief overview of what learners can expect on day 2*

Day 2	Title of agenda item	*Instructions for trainer*
9:00 – **9:15**	Recap from the previous day	*Trainer presents main ''take-aways'' from the day before*
9:15 – **9:45**	Presentation 4	*Presentation by trainer*
9:45 – **10:15**	Exercise	*Brainstorm on a specific topic and open discussion*
10:15 – **10:45**	Presentation 5	*Presentation by trainer*
10:45 – **11:15**	*Break*	*Build in an energizer towards the end of the break to give energy back in the group*
11:15 – **12:15**	Presentation 6	*Presentation by trainer*
12:15 – **13:00**	Exercise	*Case study where learners work in groups* *Discussion of case studies in plenary*
13:00 – **14:00**	*Lunch*	
14.00 – **14.10**	Energizer	*Use an energizer to get some energy back in the group after lunch*
14:00 – **14:30**	Presentation 7	*Presentation by trainer*
14:30 – **15:00**	Exercise	*Plenary discussion around a set of questions - everyone can contribute*
15:00 – **15:20**	*Break*	
15:20 – **15:45**	Quiz	*Use Kahoot!, Slido or something else to prepare a quiz with 6-10 questions on topics covered until now*
15:45 – **15:55**	Evaluation	*Learners fill in an anonymous questionnaire – either in paper or online via their mobile phone/computer*
15:55 – **16:00**	Goodbye	*Trainer concludes the course by inviting the participants to tell how they are going to use their new skills.*

Annex 3: STAT analysis package: Using Google Sheets, R and Power BI to build an interactive report of data collected

A. Software

Microsoft Power BI Desktop and R need to be installed to be able to use the provided R code and Power BI shell (in PBIX format). This can be achieved by searching on the internet to find the most recent versions and downloading and installing them. R Studio is a free Integrated Development Environment (IDE) from Posit which might also be useful when adjusting the R code. The free version of Power BI can easily be used for the analysis of the data.

B. STAT provides files for analysis

The below files provide the package for the analysis using Google Sheets, R and Power BI. The files can be downloaded from GIST's website: https://unstats.un.org/gist/resources/statistical-training-needs-assessment-tool/.

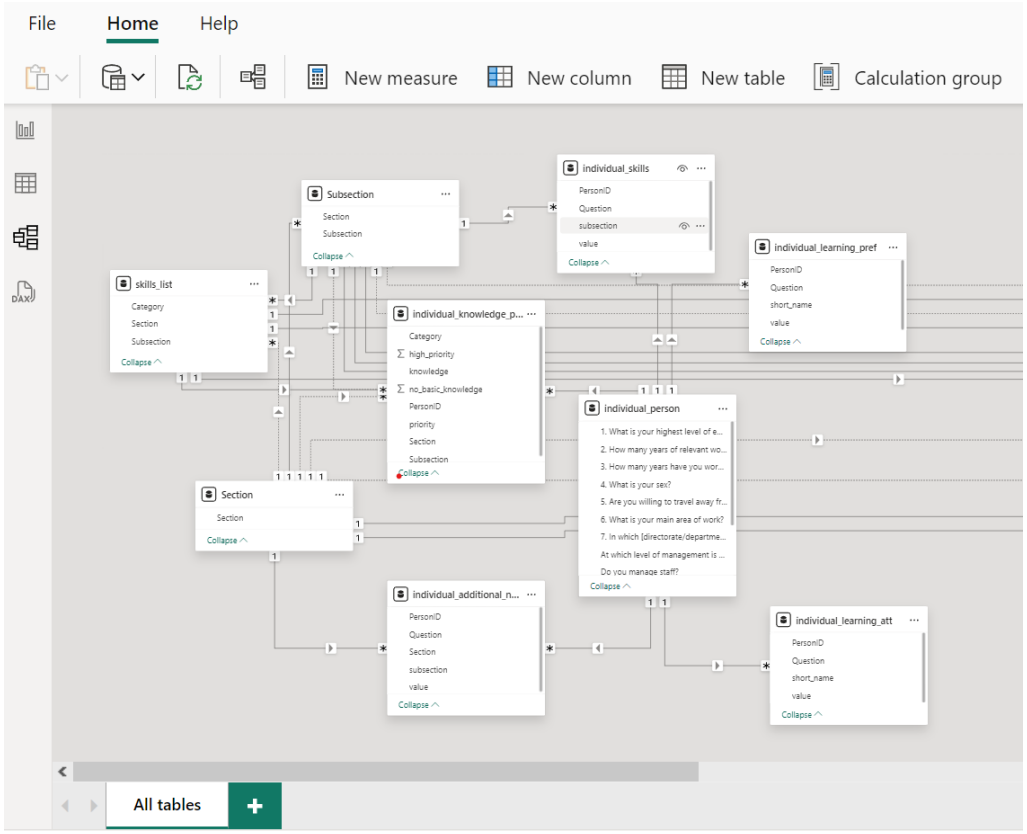
- **Three Google Forms questionnaires**: To access the three Google Forms Questionnaires, please contact the GIST Secretariat at statistics@un.org and you will receive a clean copy of the questionnaires.
- **Final skills list.csv**: A CSV file with three columns (Category, Subsection, Section) and 157 rows indicating the final list of skills.
- **Individual Needs Assessment model.R**: Reads the Individual Needs Assessment data from Google Forms and transforms it into R data frames used as model elements for Power BI (using Power BI's vocabulary, it creates dimension and fact tables).
- **Institutional Needs Assessment model.R**: Reads the Institutional Needs Assessment data from Google Forms and transforms it into R data frames used as model elements for Power BI. The R data frames are saved as CSV files in a local folder. This script should be run before the R script below.
- **Institutional Needs Assessment data read in.R**: Reads and makes additional changes to the CSV files created by 'Institutional Needs Assessment model.R', which are used as model elements for Power BI.
- **NSS Needs Assessment model.R**: Reads the NSS Needs Assessment data from Google Forms and transforms it into R data frames used as model elements for Power BI.
- **STAT.pbix**: A Power BI file with the data model and test data for the three questionnaires (Individual, Institutional and NSS).

C. Overview

Power BI is a data visualization software that takes a data model as a backend for its visualization. This model often resembles a star schema. If you're unfamiliar with what a star schema is, consider reading the article *Understand star schema and the importance for Power BI - Power BI | Microsoft Learn* for an introduction. The R code provided in STAT processes data from Google Sheets, where it is stored in wide format (one row per respondent). This code restructures the data, breaking it into components and pivoting it into a model resembling a star schema for use in Power BI. To view the resulting model, open the STAT.pbix file in the Power BI Desktop application. Select the Model View icon ( ) on the far-left ribbon to explore the imported entities and their defined relationships, which indicate how the various elements

interact in the report. It is important to note that maintaining the defined relationships between entities is crucial when new data is loaded into STAT.pbix. It might be worth familiarizing yourself with Power BI before diving into the steps to build the interactive report, which is detailed in section E.

Model View in Power BI: Example Displaying Tables, Fields, and Relationships in the STAT Data Model



The ‘About this Report’ tab in STAT.pbix provides an overview of the structure of the Power BI report created for STAT and explains how the results from the three questionnaires will be displayed in Power BI. For more details about the content of the different tabs in Power BI and how they support your analysis of the collected data, refer to the section “F. Understanding the Data in Power BI.”

Please note that STAT.pbix is preloaded with test data, allowing you to experiment with the R code and go through the process before making any changes. This approach helps you become familiar with the data and the report setup before starting your own analysis.

D. Vocabulary

For analysis purposes, STAT uses different terms to identify the different types of information captured in the questionnaire. The key terms are:

> *Category*: A category is the same as a skill. We have identified more than 150 different skills for different job functions. The skills are central in STAT. For analysis purposes, a skill is labeled *category*. The list of skills can be found in Annex 4.

Section: A section is the areas of work, in which the respondents identify themselves with at the beginning of the questionnaire. The questionnaires have integrated skip logic to bring respondents to the skill set relevant to the section they work in. There are nine sections in STAT:

- Production of statistics
- Statistics domains
- IT
- Communication and dissemination of statistics
- Finance
- Human resources
- Other administrative and secretarial function
- Management
- Skills relevant to all staff

Subsection: Three of the sections (Production of statistics, Statistics domains, Skills relevant to all staff) have subsections to give a structure to the many skills in those sections.

For the section "Production of statistics", the subsections are:

- Data collection
- Data analysis
- Data processing
- Statistical confidentiality and security
- Presenting and disseminating data
- Metadata and quality of statistics
- Data collection and processing software

For the section "Statistics domains", the subsections are:

- Demography and social statistics
- Governance statistics
- Macroeconomic statistics
- Business statistics
- Other economic and business statistics
- Energy and environment statistics
- Cross-cutting statistics

For the section "Skills relevant to all staff", the subsections are:

- Understanding the statistical system
- Personal skills
- Software skills

E. Steps to build the interactive report in Power BI

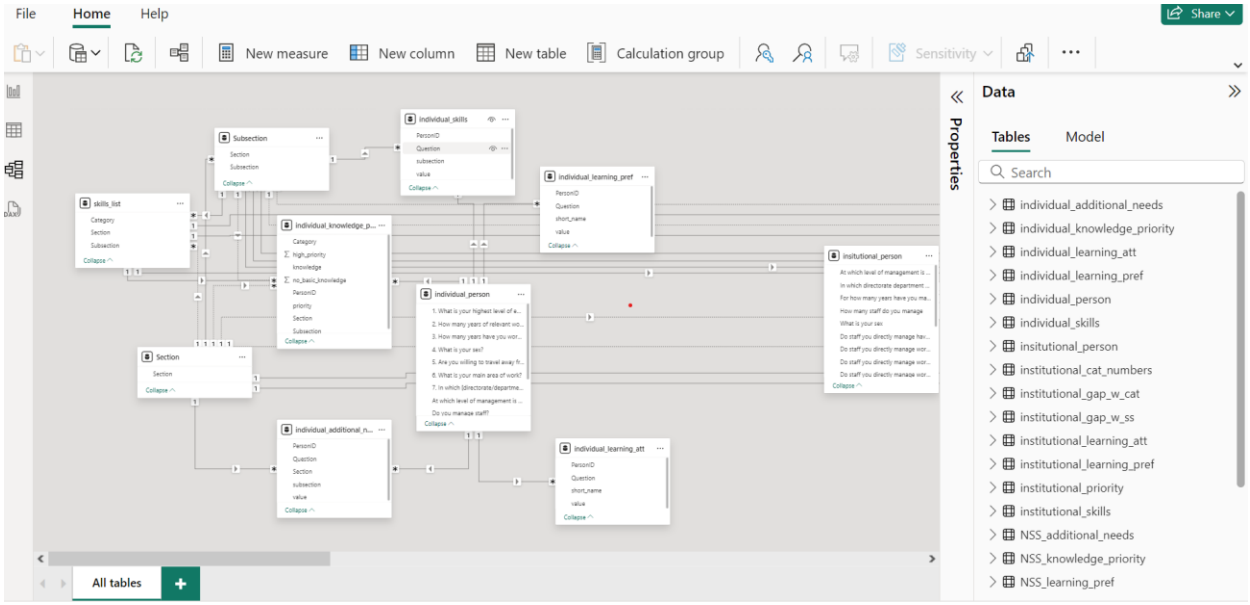
1. Before the surveys are launched, change anything in the questionnaires that you wish to, including the required changes in [] or {} as explained in sections 2.1, 2.1 and 2.3.
   - Remember to keep track of any category changes in the file *Final skills list.csv*. The data in this file is imported as a data frame in both the R code and Power BI to give a standardized way of connecting all the bits.[21]
   - Keep the three questionnaires aligned so that you can compare the information from the three perspectives.
   - It is recommended to maintain a file (e.g. a Word document) where you record changes made to questionnaires and R scripts, as this can be helpful for debugging errors.
2. Send the links for the questionnaires out to the respondents who you wish to target for each of the three questionnaires.
3. Close the surveys at the end of the agreed collection period.
4. For each questionnaire, create (also called 'link' in Google terminology) a Google Sheet. You do this in the 'Responses' tab in the Google Forms browser interface for the questionnaires, where there is a button in the top right corner 'View in Sheets' which, when clicked will output the responses from the questionnaire to a Google Sheet.
5. Once the Google Sheet is created it will open in a new window in the browser. From the URL, extract (copy) the ID of the Google Sheet file - you only need to copy the string from after 'https://docs.google.com/spreadsheets/d/' and until '/edit?…..' (tip: the ID does not include any '/')
6. Open the R files in RStudio or another IDE of your choice
   - Insert the Google Sheet ID for the corresponding questionnaire in the appropriate place in the corresponding R code file. Make sure that you give Google authorization to connect with R[22]. When you run the code files, Google might ask for permission, which should be granted.
   - Update the file paths to reflect where you are storing your work. For the code file "Individual Needs Assessment model.R" this concerns the "Final skills list.csv". For the code file "Institutional Needs Assessment data read in.R" this concerns the R data frames generated as CSV files by the code file "Individual Needs Assessment model.R".
   - If you have made changes to the questionnaires besides the skills, update any section that needs updating. To do this, it is suggested to run each line separately and inspect the output of that line to ensure the code is behaving as expected. If you need help with R, *Bing chat* is a great resource.
   - Ensure all R code files run without error.
7. Open the Power BI file STAT.pbix. This file includes test data from the Individual, Institutional and NSS questionnaires. The test data was loaded into STAT.pbix using the four R files and the R connecter Power BI[23]. The data is loaded into STAT.pbix as Tables in the Data menu shown on the right side of the Power BI window (see image below).

[21] When updating the .csv file, it is crucial to preserve the correct column separation format. In .csv files, any text within columns that contains commas (e.g., "Survey methodology, such as choosing a target population or sampling techniques…") must be enclosed in quotation marks to ensure proper parsing.

[22] The R files utilize the *googlesheets4* package to access questionnaire response data stored in Google Sheets. To use this package, users must authenticate their Google accounts to enable access. When running googlesheets4 functions for the first time, a browser window will open, prompting you to log in and grant the necessary permissions. Tip: If you need to update your authorization at any point, you can use the *gs4_auth()* function.

[23] Run R scripts in Power BI Desktop - Power BI | Microsoft Learn

Data Tables in Power BI: Example Displaying Tables



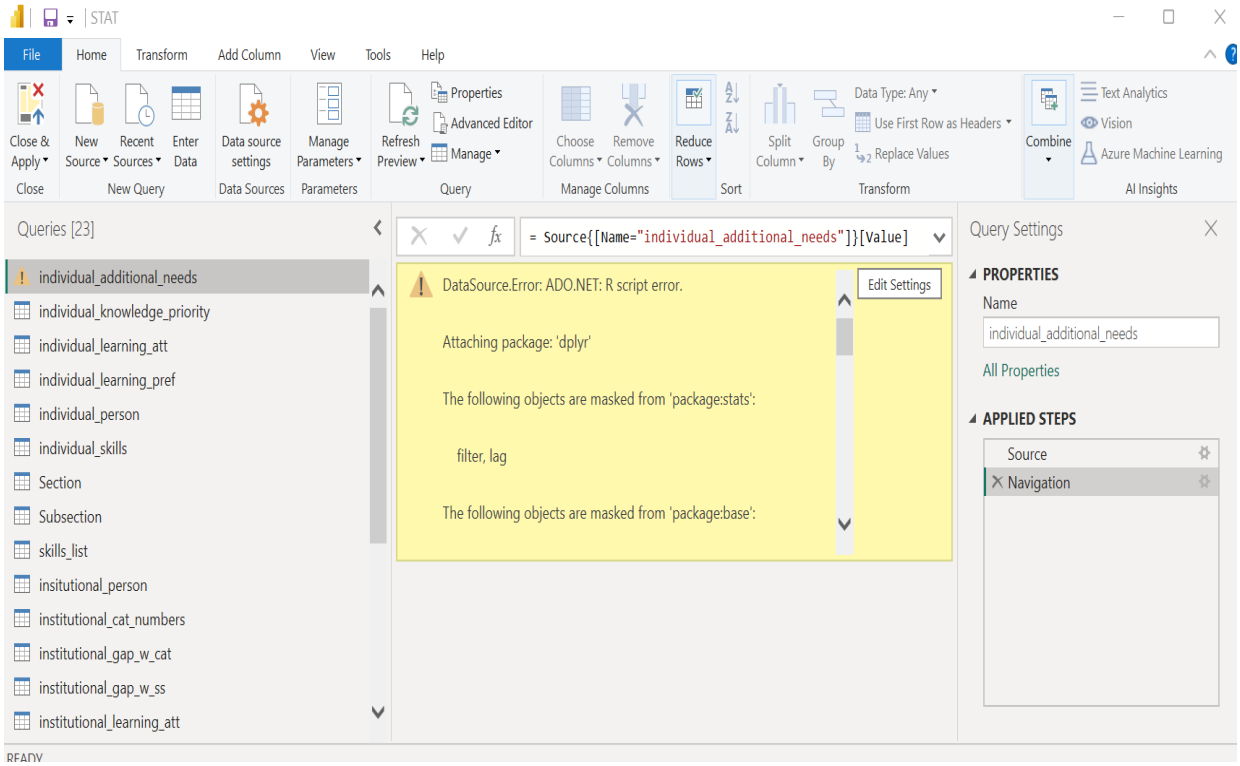
The STAT Data Model comprises 23 tables preloaded with test data. To update these tables with new data, each must be loaded individually using the R connector in Power BI[24], following the steps outlined below. Note that Tables 1 through 22 directly correspond to specific R data frames (with matching names) generated by the R scripts.

Table Name	R file that creates Table
1) individual_additional_needs	*Individual Needs Assessment model.R*
2) individual_knowledge_priority	*Individual Needs Assessment model.R*
3) individual_learning_att	*Individual Needs Assessment model.R*
4) individual_learning_pref	*Individual Needs Assessment model.R*
5) individual_person	*Individual Needs Assessment model.R*
6) individual_skills	*Individual Needs Assessment model.R*
7) Section	*Individual Needs Assessment model.R*
8) Subsection	*Individual Needs Assessment model.R*
9) Skills_list	*Individual Needs Assessment model.R*
10) Institutional_person	*Institutional Needs Assessment data read in.R and Institutional-Needs-Assessment-model*
11) Institutional_cat_numbers	*Institutional Needs Assessment data read in.R and Institutional-Needs-Assessment-model*
12) Institutional_gap_w_cat	*Institutional Needs Assessment data read in.R and Institutional-Needs-Assessment-model*
13) Institutional_gap_w_ss	*Institutional Needs Assessment data read in.R and Institutional-Needs-Assessment-model*
14) Institutional_learning_att	*Institutional Needs Assessment data read in.R and Institutional-Needs-Assessment-model*
15) Institutional_learning_pref	*Institutional Needs Assessment data read in.R and*

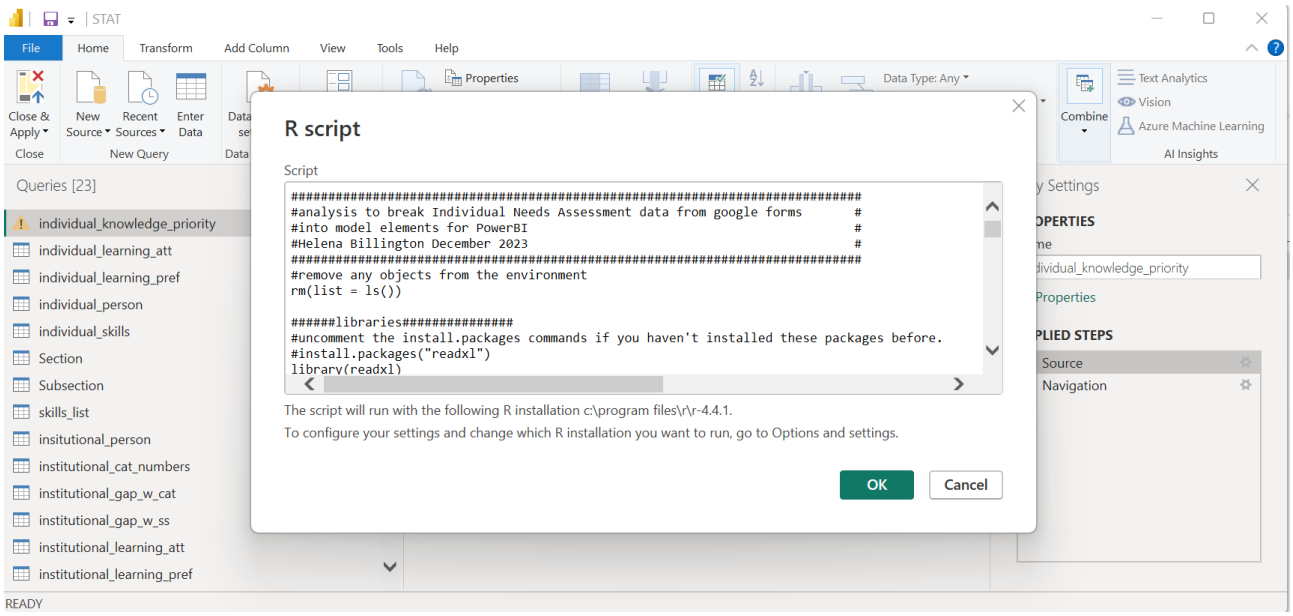
[24] Run R scripts in Power BI Desktop - Power BI | Microsoft Learn

	Institutional-Needs-Assessment-model
16) Institutional_priority	*Institutional Needs Assessment data read in.R and Institutional-Needs-Assessment-model*
17) Institutional_skills	*Institutional Needs Assessment data read in.R and Institutional-Needs-Assessment-model*
18) NSS_additional_needs	*NSS Needs Assessment model.R*
19) NSS_knowledge_priority	*NSS Needs Assessment model.R*
20) NSS_learning_pref	*NSS Needs Assessment model.R*
21) NSS_person	*NSS Needs Assessment model.R*
22) NSS_skills	*NSS Needs Assessment model.R*
23) Tabs	None, it is a part of STAT data model – should be untouched.

While there are multiple methods to upload data into Power BI, we recommend following these steps to use the R connector for linking the corresponding R script to a specific query or table (e.g., individual_additional_needs). First, open the Power Query Editor by navigating to the Home tab and selecting Transform Data. In the Editor, you will see a list of the 23 queries (left), a message indicating an error in the R script (middle), and Query Settings (right).



The R script error indicates that the R files embedded in the STAT file, originally used to load the test data, must be updated with the new data. To proceed, click the Source icon ( ) in Query Settings under Applied Steps to open the R Script editor window.



Clear all text from the Script window, then copy and paste the corresponding R script as outlined in steps 8, 9, and 10 below. Click OK and repeat the process for each query until all tables have been successfully loaded.

8. Use the R connecter in Power BI[25], paste in the code in *Individual Needs Assessment model.R* in the following 9 tables: All beginning with 'individual_' (6), skills_list (1), Subsection (1) and Section (1).
9. Use the R connector in Power BI, paste in the code in *Institutional Needs Assessment data read in.R* in all 8 datasets beginning with 'institutional_'.
10. Use the R connecter in Power BI, paste in the code in *NSS Needs Assessment model.R* in all 5 datasets beginning with 'NSS_'. If the NSS questionnaire has not be used, just leave the test data and R Scripts untouched. You might want to adjust the title of the four NSS tabs to highlight that this is still test data.
11. Once all tables are correctly loaded without errors, click Home tab > Close & Apply to load the new data. As STAT.pbix already comes with a fixed data model and visuals for each of the three questionnaires, there is no need to make adjustments, but you need to check if the visuals run correctly.
12. In Power BI's 'Model View' (icon in the far-left ribbon) make sure that all of the relationships are working and defined as you wish for your schema and analysis.
13. In the 'Report View' (icon in the far-left ribbon) you can modify any of your data as well as edit queries and refresh data.
    - Look at the data side panel to see what types each column is, if there is something that you wish to sum (rather than count) make sure it has a capital sigma in front of it. If it does not, you can change the type of the column by right-clicking on the column name in this data side panel.
    - If you need to update the data, you can get to the source R code by right-clicking on the name of the data set in the data side panel and selecting Edit query.
    - If you want to refresh all data sets (i.e. run the existing pasted-in queries again) you can click the Refresh icon on the top Home ribbon.

[25] Run R scripts in Power BI Desktop - Power BI | Microsoft Learn

14. In the 'Report View' make sure that the Power BI visuals already created in STAT.pbix are working or create your own Power BI visuals. You can also change the type of visual, which data is displayed, titles and colours by using the Visualizations side panel. You can also set up drillthroughs[26] if this is useful. The example provided in STAT.pbix allows you to filter the reports for the same questionnaire based on a selection in the summary page.
15. Update the 'About this report' tab with any changes that you have made. If you do not have an organizational license for Power BI, you can share the report with people by providing them with the saved .pbix file and them installing the Power BI Desktop application. If you have a paid organizational license to Power BI, publish the report to anyone you would like to share it with.

F. Understanding the data in Power BI

The report in STAT.pbix is designed to guide the analysis of the data from the three questionnaires. There are four tabs for each of the questionnaires displaying data from the surveys in the same general pattern:

1. Key information about the respondents
2. Information about respondents' preferred learning styles and attitude
3. Summary of identified skills gaps, knowledge and training priorities for two sections: Statistics production and Statistics domains (as these are other more complex than the other sections)
4. Details of learning needs, knowledge and training priority in all sections

It is recommended to examine the content of the tabs and data visualizations in Power BI to get comfortable with the presentation of the data.

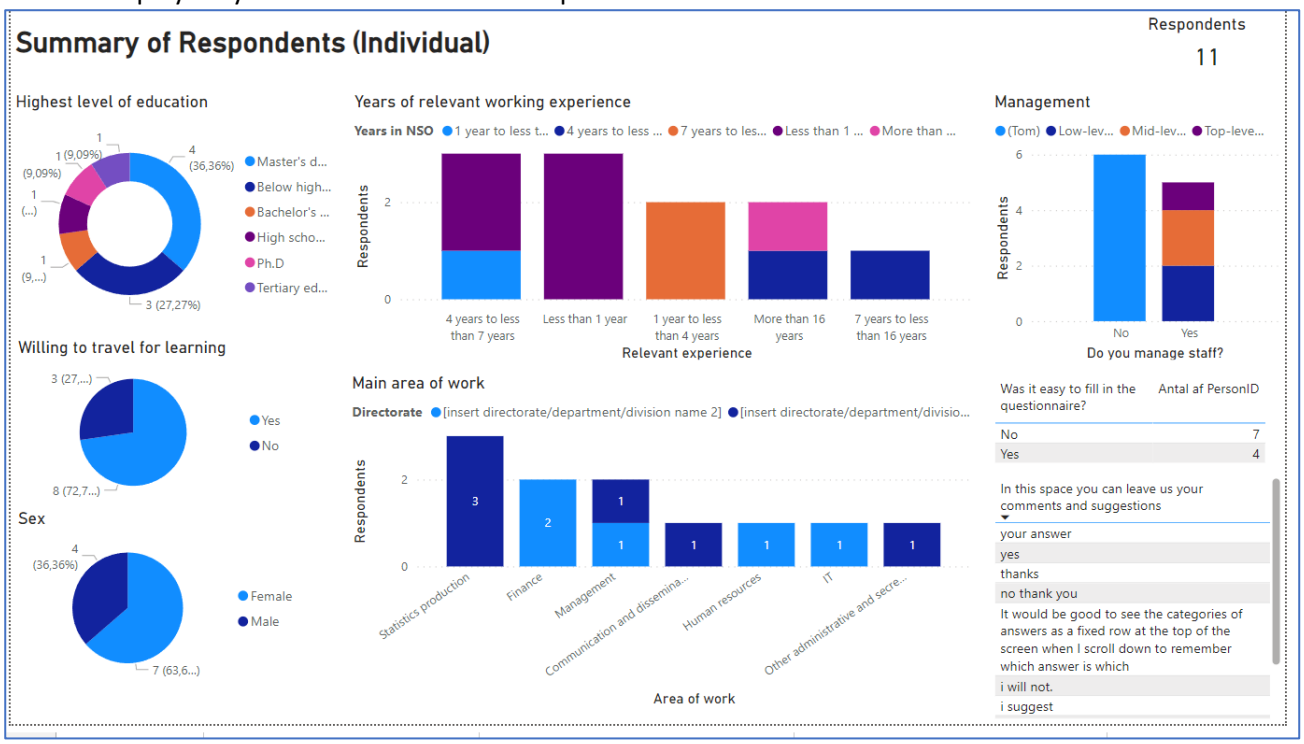
Below, the data in each tab are explained.

[26] https://learn.microsoft.com/en-us/power-bi/create-reports/desktop-drillthrough

F.1 Data from the NSO Individual Needs Assessment

Tab: Summary of Respondents (Individual)

This tab displays key information about the respondents.

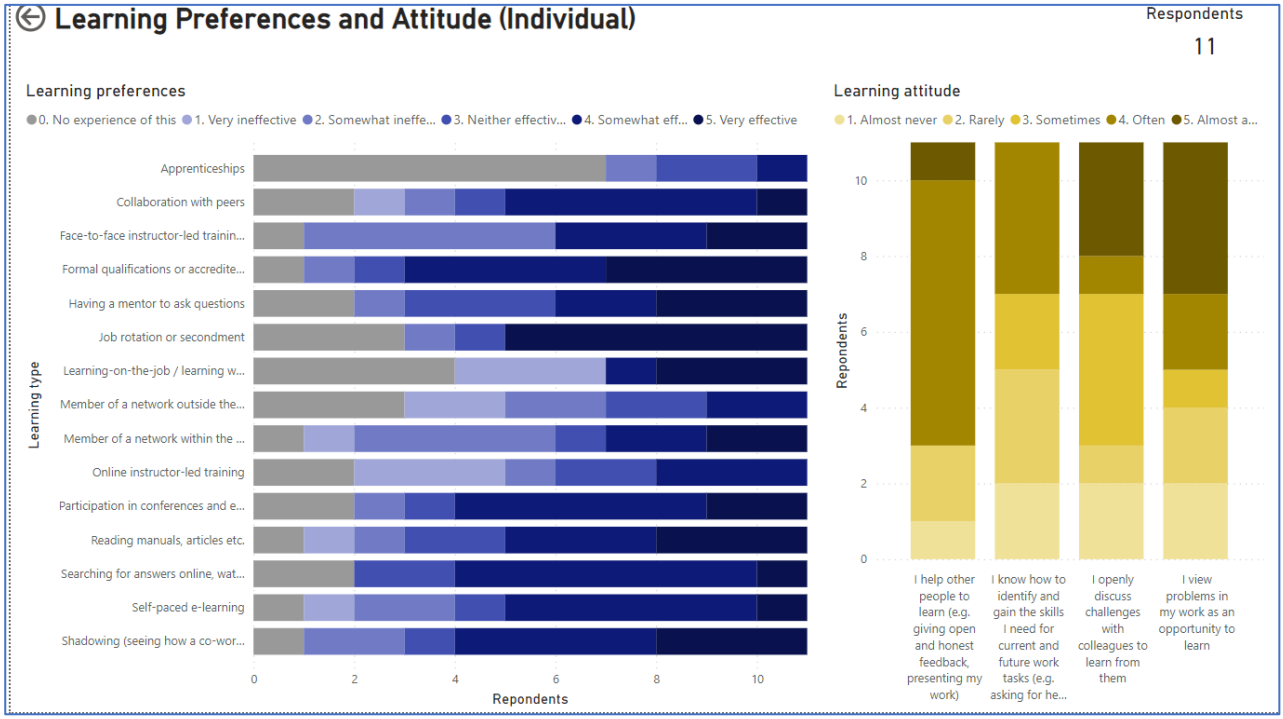


Explanation of the visualizations:

- The graph ”Years of relevant working experience” combines two questions on years of relevant working experience and how many years the staff has worked in the NSO. This is useful information as staff incl. new staff might bring skills from other organizations.
- The graph “Main area of work” combines two questions on which organizational unit the staff works in and the main area of work they identify themselves with. This distribution of the respondents is useful to see which units and types of staff have filled in the survey. If needed, a separate analysis can be done for each unit in the organization where data from each unit is extracted and analyzed in its own merit.
- The graph “Management” displays data on how many respondents have management responsibilities and at which level (low, middle or top level).
- The list in the lower right corner, provides the results from the last questions of the questionnaire on whether the questionnaire was easy to fill in and if the respondent had any feedback.

Tab: Learning Preferences and Attitude (Individual)

This tab displays information about respondents' preferred learning styles and attitudes to statements on learning.

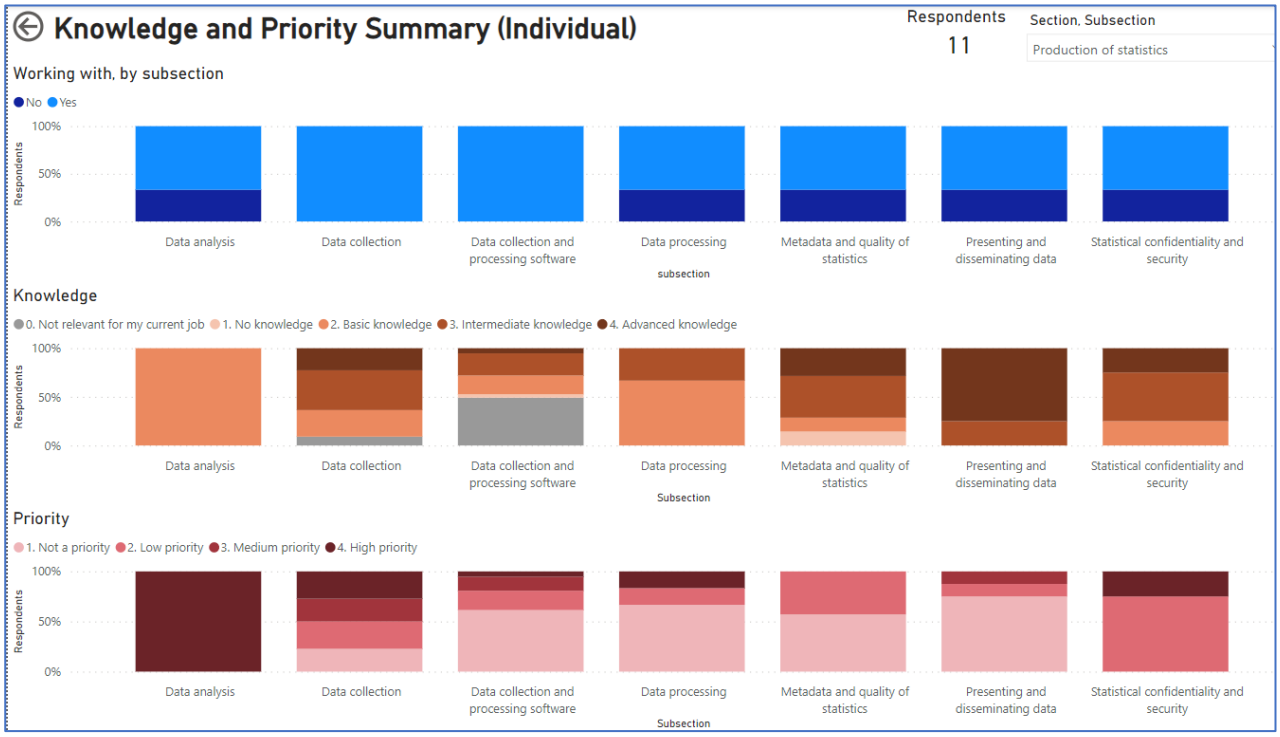


Explanation of the visualizations:

- The graph "Learning preferences" displays the distribution of responses to learning preferences per type of learning style. This information is useful to understand how respondents currently prefer to learn and where the NSO might need to encourage other types of learning styles e.g. in the case where e-learning is not considered effective by respondents but will be widely introduced in the institutional learning plan as a new way of learning.
- The graph "Learning attitude" displays the distribution of respondents' attitudes to four statements on learning. This information can be used to establish a dialogue within the organization on how to work towards a learning organization (see Chapter 6 on creating a learning organization).

Tab: Knowledge and Priority Summary (Individual)

This tab displays a summary of identified skills gaps, knowledge, and training priorities for two sections: Statistics production and Statistics domains. These two sections contain several subsections (as explained in D. Vocabulary) and this summary provides an overview of the responses of staff working with different areas and domains of statistics production. You can choose which section/subsection you want to see displayed by using the top right dropdown menu "Section, Subsection".

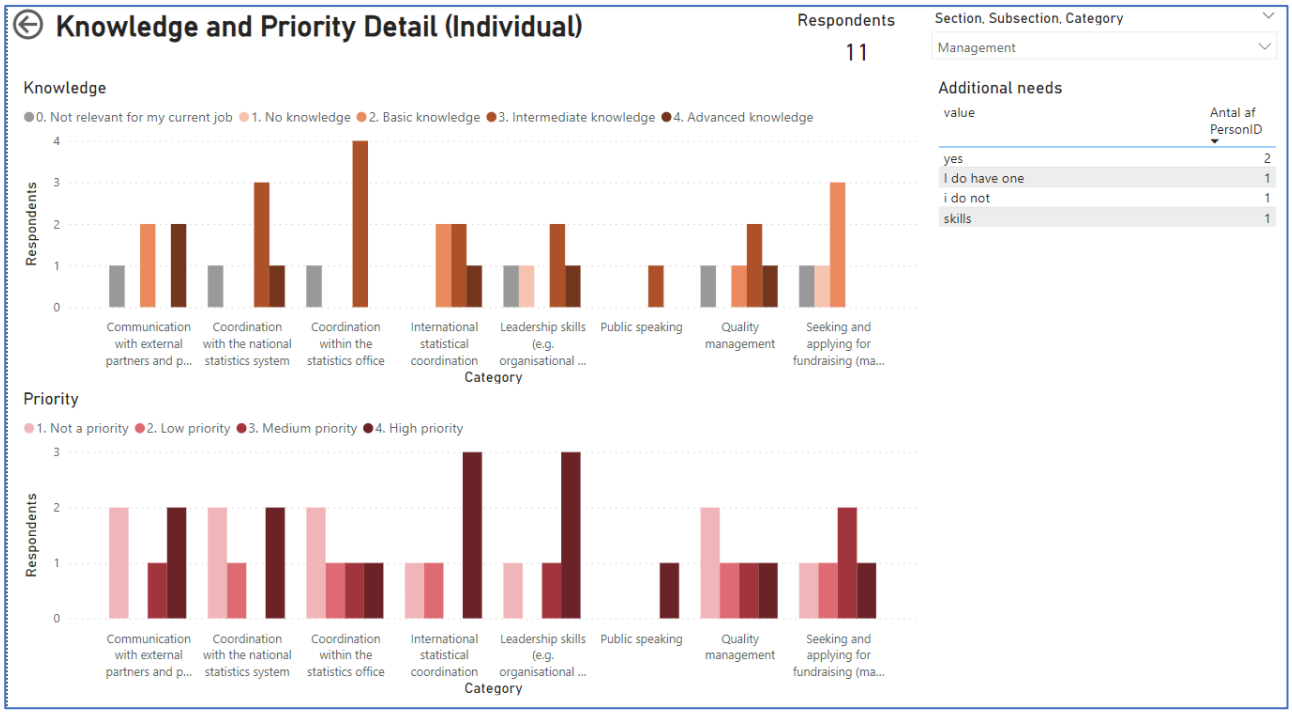


Explanation of the visualizations:

- The graph "Working with, by subsection" displays the distribution of respondents who answered either yes or no to whether they work with the topic of the subsection. E.g. 33% of respondents working with statistics production say that they do not work with *data processing*, while 67% say they work with data processing. This means that only 67% will be asked about their skills in data processing, while 33% will not be asked those questions.
- In the graph "Knowledge", the responses from those who answered "yes" in the above graph are distributed according to their different level of knowledge of the skills within the subsection. E.g. for *data processing*, 33% are at the intermediate knowledge level, while 67% are at the basic knowledge level.
- In the graph "Priority", the responses from those who answered "yes" in the first graph are distributed according to the training priority of relevant skills within the subsection. E.g. for data processing, 17% are a high priority, 17% are low priority and 66% are not a priority (i.e. training is not needed).
- The summary graphs can be used to compare the skills levels and training needs across the different subsections on equal terms without the weight of how many respondents work with the topic of the subsection. E.g. in this example, it is clear that staff has a high need for training in data analysis skills and a lower need in presenting and disseminating data.

Tab: Knowledge and Priority Detail (Individual)

This tab displays details of learning needs, knowledge, and training priority in all sections/subsections. You can choose which section/subsection/category you want to display by using the top right dropdown menu "Section, Subsection, Category". In the example below, we have chosen to display data on management skills.



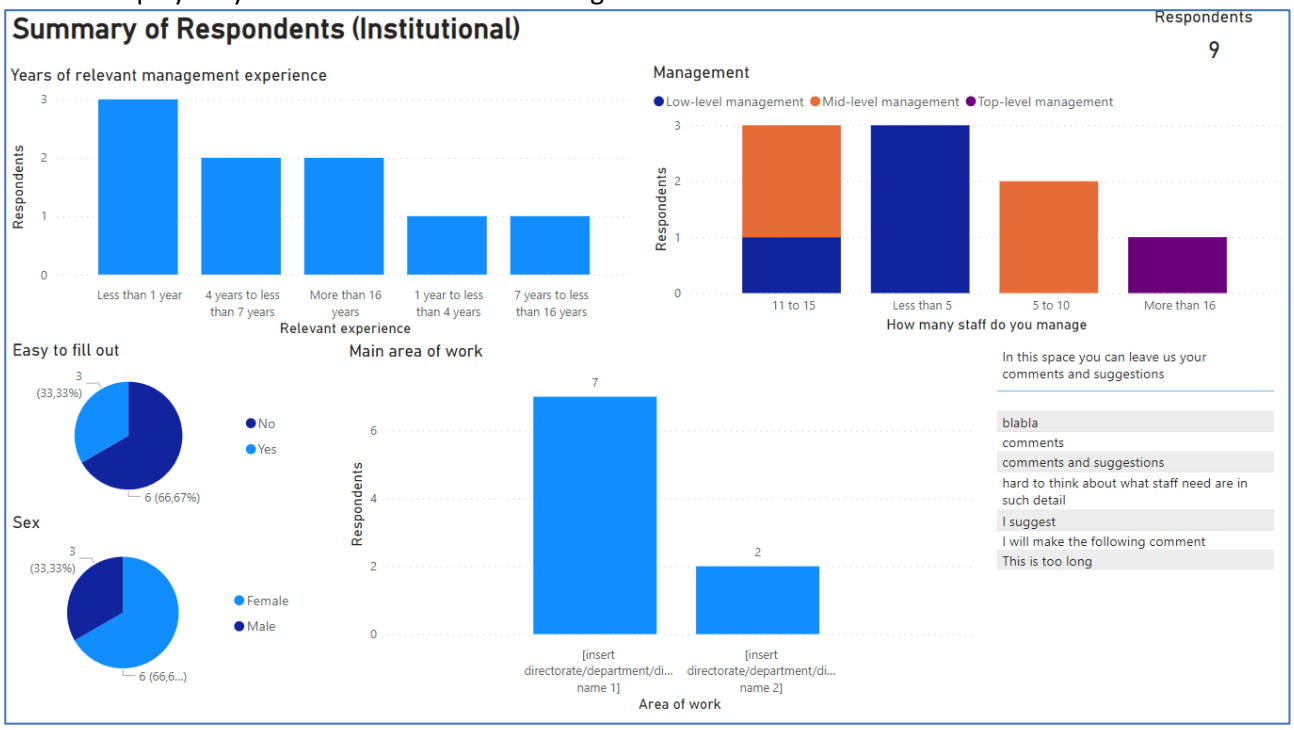
Explanation of the visualizations:

- The graph "Knowledge" displays data on respondents' identified level of knowledge of each relevant skill within the chosen section/subsection. E.g. for the skill *coordination within the statistics office*, four respondents say they have intermediate knowledge, while one respondent says the skill is not relevant to their current job.
- The graph "Priority" displays data on respondents' identified level of training needs by each relevant skill within the chosen section/subsection. E.g. for the skill *coordination within the statistics office*, two respondents said that training is not a priority, while one respondent answered that the training need is respectively low, medium and high.
- For analysis purposes, these graphs are key to deciding which needs to be included in an institutional learning plan.
- The list in the top right corner, provides feedback from the open-ended question where the respondent can provide information on any learning needs, they have, and which are not covered in the questionnaire.

F.2 Data from the NSO Institutional Needs Assessment

Tab: Summary of Respondents (Institutional)

This tab displays key information about the managers.

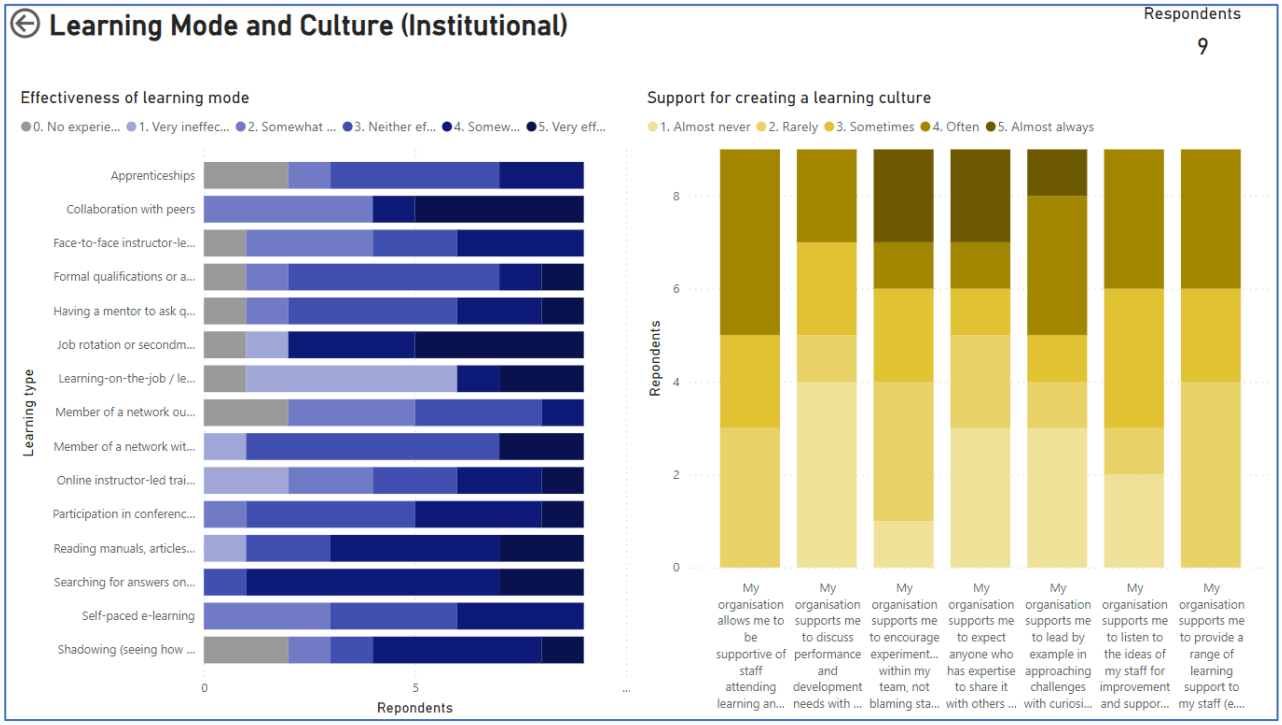


Explanation of the visualizations:

- The graph “Management” combines two questions on the level of management and how many staff the manager manages. This distribution of respondents is useful to identify which units and types of staff have filled in the survey.
- The graph “Main area of work” provides data on the main area of work and organizational unit which the manager identifies with. If needed, a separate analysis can be done for each organizational unit where data from each unit is extracted and analyzed on its own.
- The list in the lower right corner, provides the results from the feedback and comments which the manager can provide at the end of the questionnaire.

Tab: Learning Mode and Culture (Institutional)

This tab displays information about managers' opinions on learning styles and attitudes to statements on learning.

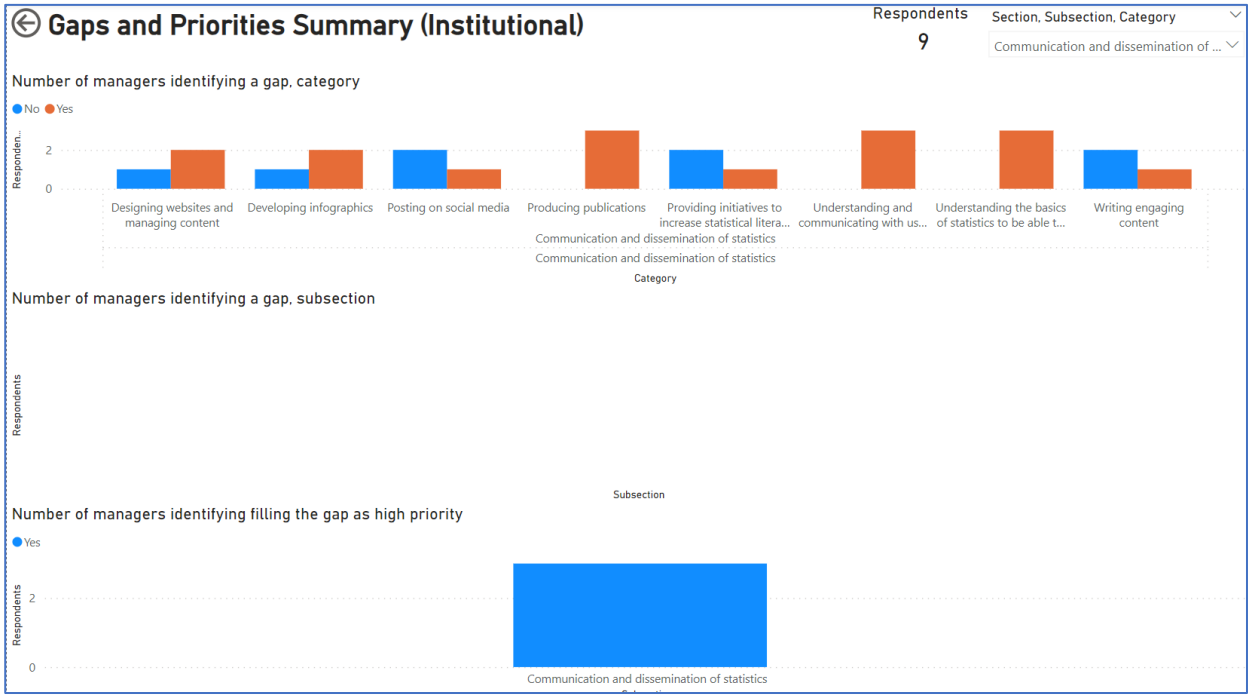


Explanation of the visualizations:

- The graph "Effectiveness of learning mode" displays the distribution of responses to how effective managers find different learning styles. This information is useful to understand how managers currently perceive types of learning and where the NSO might need to encourage the use of other types of learning styles e.g. in the case where e-learning is not considered effective by managers but will be widely introduced in the institutional learning plan as a new way of learning.
- The graph "Support for creating a learning culture" displays the distribution of managers' attitudes to seven statements on learning. This information can be used to establish a dialogue within the organization on how to work towards a learning organization (see Chapter 6 on creating a learning organization).

Tab: Gaps and Priorities Summary (Institutional)

This tab displays managers' identified skills gaps and high-priority training needs for the staff they directly manage by section, subsection, and category.

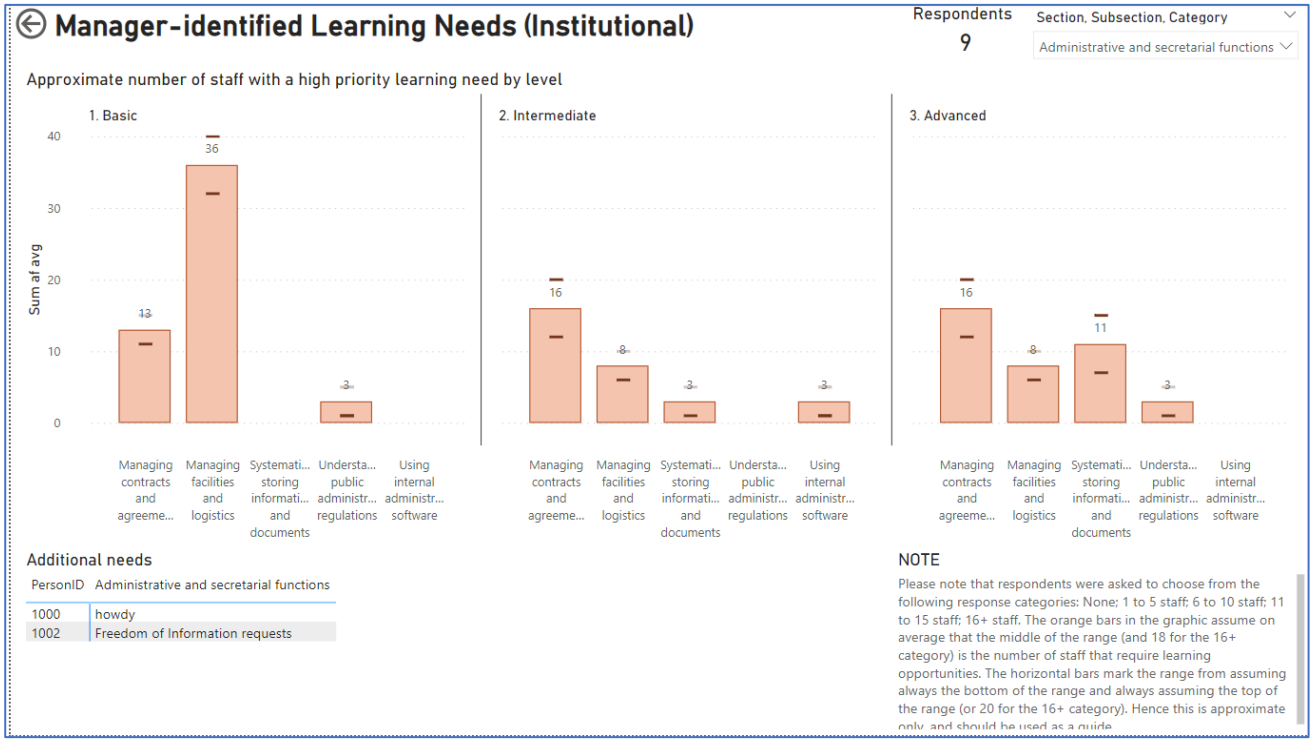


Explanation of the visualizations:

- The graph "Number of managers identifying a gap, category" displays data on the number of managers who have identified a gap in the skill of staff they directly manage by category for all sections except statistics production (see below bullet).
- Similar to above, the graph "Number of managers identifying a gap, subsection" will display data on the number of managers who have identified a gap in the skills of staff they directly manage but by the subsections for production of statistics and statistics domains.
- The graph "Number of managers identifying filling the gap as a high priority" displays data on how many managers believe their staff has a high priority training need by section and subsection (for the section 'statistics production' only).
- For analysis purposes, this data is useful to investigate which areas managers believe their staff has a gap in their skills level and which areas are a high priority. Please note that managers are only asked about high-priority training needs as opposed to the NSO Individual Needs Assessment where staff identifies their training needs as either high, medium, low, or none.

Tab: Manager-identified Learning Needs (Institutional)

This tab displays the number of staff that managers have identified as having a high-priority learning need by the level of knowledge they need training in: Basic, intermediate, or advanced



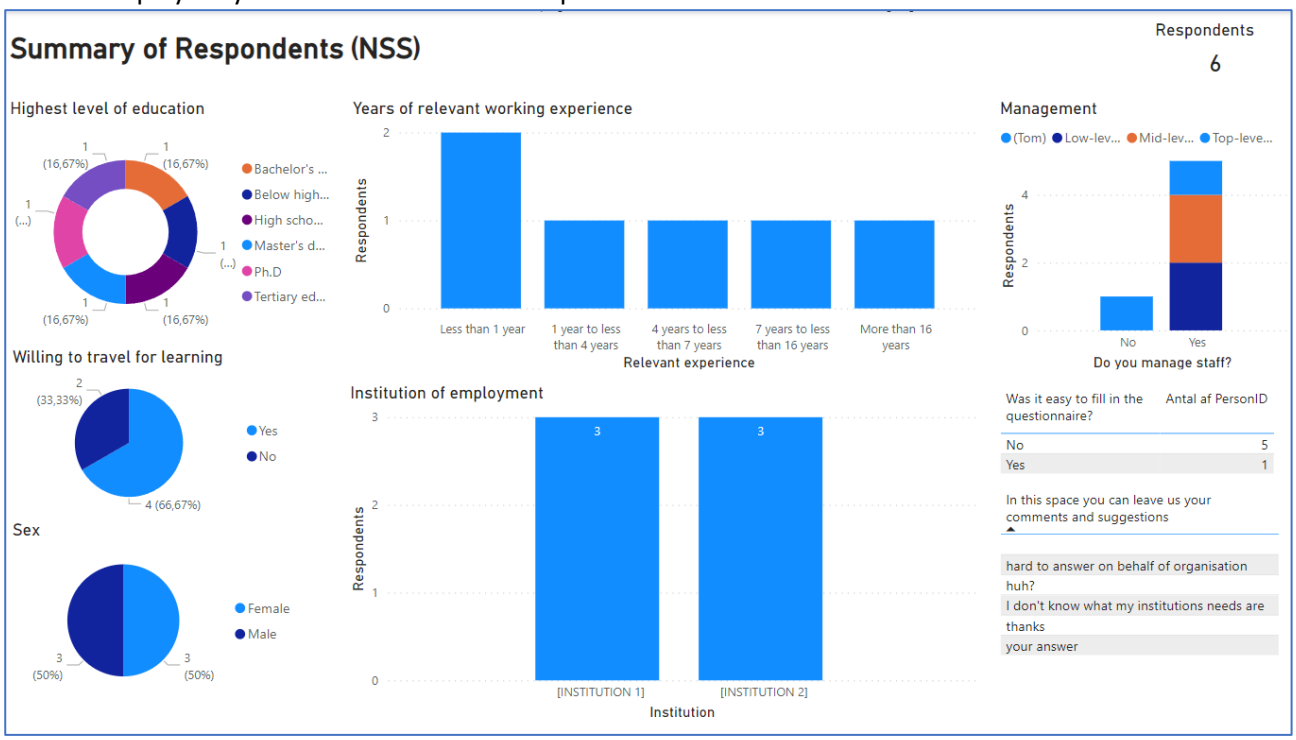
Explanation of the visualizations:

- Note that respondents were asked to choose from the following response categories: None; 1 to 5 staff; 6 to 10 staff; 11 to 15 staff; 16+ staff. The orange bars in the graphic assume on average that the middle of the range (and 18 for the 16+ category) is the number of staff that require learning opportunities. The horizontal bars mark the range from always assuming the bottom of the range and always assuming the top of the range (or 20 for the 16+ category). Hence these are approximate numbers only and should be used as a guide to identify which skills many staff have a high priority training need according to managers.
- The list in the lower left corner, provides feedback from the open-ended question where the manager can provide information on any learning needs not covered in the questionnaire.

F.3 Data from the NSS Needs Assessment

Tab: Summary of Respondents (NSS)

This tab displays key information about the respondents.

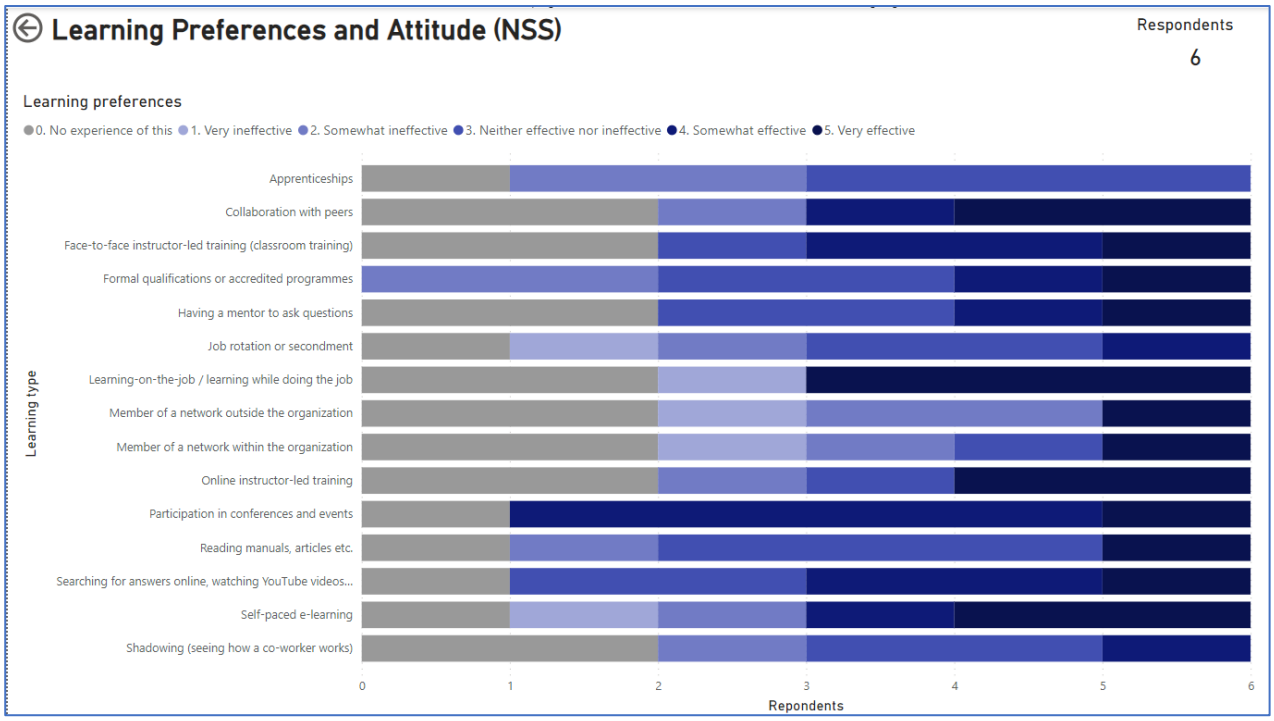


Explanation of the visualizations:

- The graph ”Institution of employment” displays data on how many respondents have filled in the questionnaire by institution in the NSS.
- The graph “Management” displays data on how many respondents have management responsibilities and at which level (low, middle, or top level).
- The list in the lower right corner, provides the results from the last questions of the questionnaire on whether the questionnaire was easy to fill in and any feedback from the respondent.

Tab: Learning Preferences and Attitude (NSS)

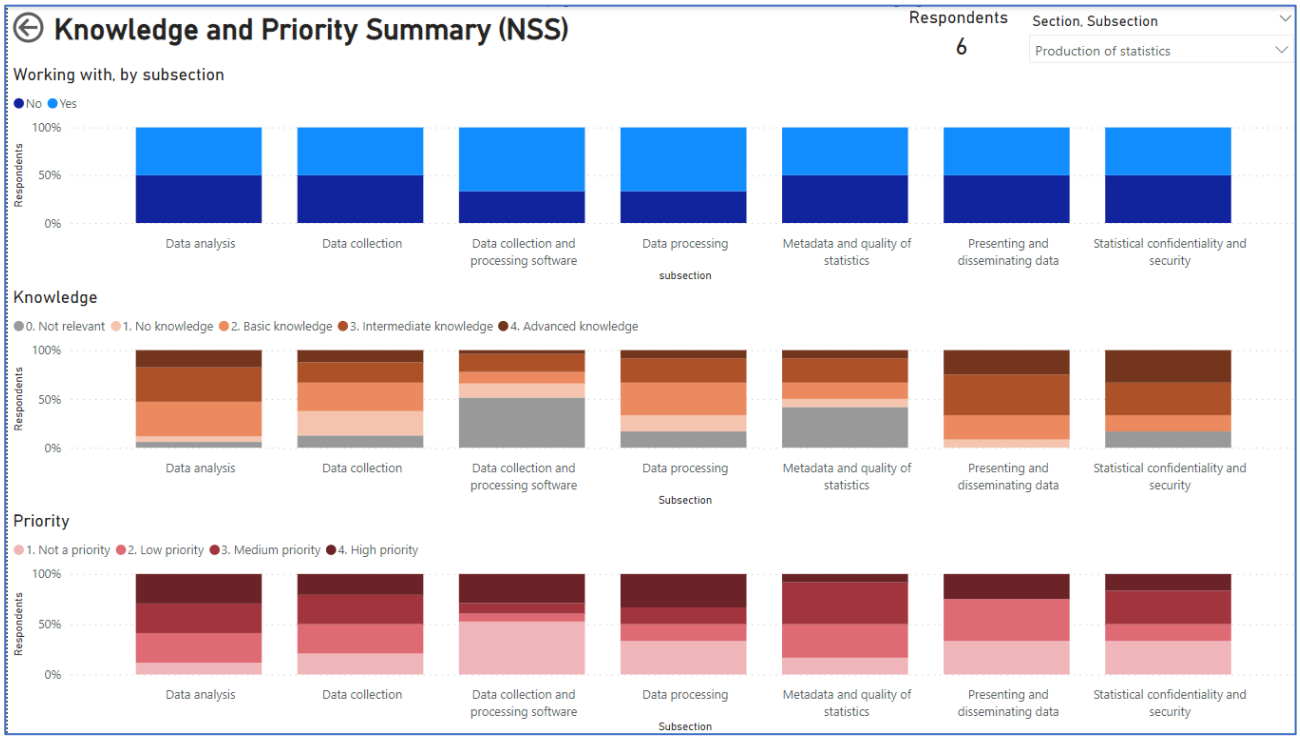
This tab displays information about respondents' preferred learning styles.



- The graph "Learning preferences" displays the distribution of responses to learning preferences per type of learning style. This information is useful to understand how respondents currently prefer to learn and where the NSO might need to encourage other types of learning styles e.g. in the case where e-learning is not considered effective by respondents but will be widely proposed as a way of learning.

Tab: Knowledge and Priority Summary (NSS)

This tab displays a summary of identified skills gaps, knowledge, and training priorities for two sections: statistics production and statistics domains. These two sections contain several subsections (as explained in D. Vocabulary) and this summary provides an overview of the responses from everyone working in different areas and domains of the statistics production. You can choose which section/subsection you want to see displayed by using the top right dropdown menu “Section, Subsection”.



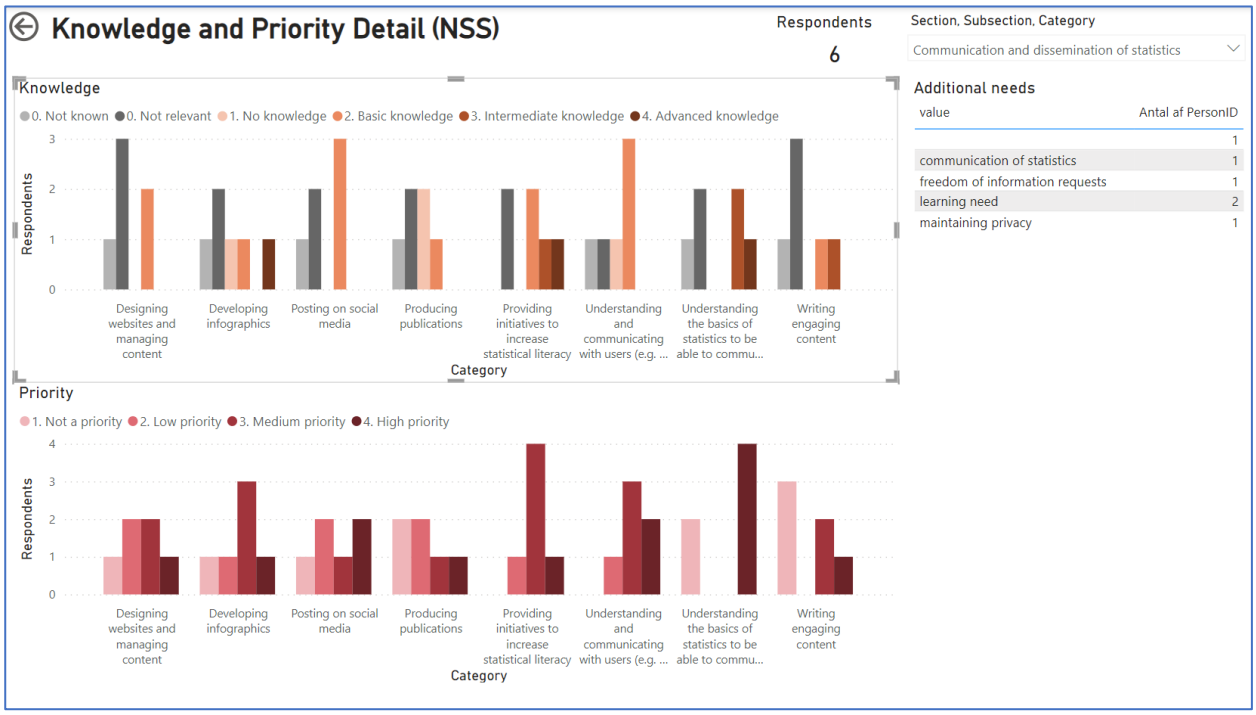
Explanation of the visualizations:

- The graph “Working with, by subsection” displays the distribution of respondents who answered either yes or no to whether they work with the topic of the subsection. E.g. 33% of respondents working with statistics production say that they do not work with *data processing*, while 67% say that they work with data processing. This means that only 67% will be asked about their skills in data processing, while 33% will not answer questions on skills.
- In the graph “Knowledge”, the responses from those who answered “yes” in above graph are distributed according to their different level of knowledge of relevant skills within the subsection. E.g. for *data processing*, 8% are at the advanced knowledge level, 25% are at the intermediate knowledge level, 33% are at the basic knowledge level and 17% are at no knowledge level.
- In the graph “Priority”, the responses from those who answered “yes” in the first graph are distributed according to the training priority of relevant skills within the subsection. E.g. for *data processing*, 33% are a high priority, 17% are low priority and 66% are not a priority (i.e. training is not needed).
- The summary graphs can be used to compare the skills levels and training needs across the different subsections on equal terms without the weight of how many respondents work with the topic of the subsection.

Tab: Knowledge and Priority Detail (NSS)

This tab displays details of learning needs, knowledge, and training priority in all sections. You can choose which section/subsection/category you want to display by using the top right dropdown menu “Section, Subsection, Category”. In the example below, we have chosen to display data on skills relevant to communication and dissemination of statistics.

Please note that for the NSS Needs Assessment, respondents are not asked about skills in HR, finance, and administrative and secretarial functions. Questions related to skills in IT and communication and dissemination of statistics are based on the respondent’s attitude on their institution’s ability to handle these areas.



Explanation of the visualizations:

- The graph “Knowledge” displays data on respondents’ attitudes to the level of knowledge in their institution of skill within the chosen section/subsection/category. E.g. for the skill *designing websites and managing content*, two respondents say their institution has basic knowledge, one respondent says the skill is not relevant to the institution, and one respondent says that it does not know the level of knowledge in the institution.
- The graph “Priority” displays data on respondents’ attitudes to the level of training needs in the institution by skill within the chosen section/subsection/category. E.g. for the skill *designing websites and managing content*, one respondent says that training is not a priority for the institution, two respondents answered that their institution has low priority training needs, two respondents answered that their institution has medium priority training need, and one says that the training need of the institution is of high priority.
- For analysis purposes, these graphs are key to identifying where the NSS has training needs.
- The list in the top right corner, provides feedback from the open-ended question where the respondent can provide information on any learning needs not covered in the questionnaire.

Annex 4. List of skills

Section	Subsection	Skill (Category)
Production of statistics	Data collection	Developing and maintaining the Geographic frame/standard
Production of statistics	Data collection	Survey methodology (e.g. choosing target population, sampling techniques and weighting design)
Production of statistics	Data collection	Designing a questionnaire (incl. clarifying information needs, designing and testing questions, determining logic and edit rules)
Production of statistics	Data collection	Providing enumerator and supervisor training (incl. interview techniques)
Production of statistics	Data collection	Developing a realistic survey implementation plan with resource and time allocation
Production of statistics	Data collection	Discovering, evaluating and obtaining administrative data sources
Production of statistics	Data collection	Discovering, evaluating and obtaining geospatial data sources (e.g. satellite imagery)
Production of statistics	Data collection	Discovering, evaluating and obtaining other big data sources (e.g. smart electricity meters, supermarket scanner data)
Production of statistics	Data processing	Maintaining statistical registers (e.g. business registers, population registers, agricultural registers)
Production of statistics	Data processing	Editing and cleansing data (edit specifications, error handling, outlier management, imputation)
Production of statistics	Data processing	Integrating data from different sources (incl. survey and administrative data or other types of data)
Production of statistics	Data analysis	Descriptive data analysis (incl. central tendency and dispersion)
Production of statistics	Data analysis	Diagnostic data analysis (incl. hypothesis testing, multivariate analysis, regression)
Production of statistics	Data analysis	Predictive analysis (e.g. population projections, life tables, forecasting)
Production of statistics	Data analysis	Small area estimation
Production of statistics	Data analysis	Index calculations
Production of statistics	Data analysis	Time series analysis (e.g. trend estimation, seasonal adjustment)
Production of statistics	Data analysis	Geospatial analysis
Production of statistics	Data analysis	Applying data science methods (e.g. machine learning, artificial intelligence, data mining)
Production of statistics	Statistical confidentiality and security	Protecting data against disclosure (e.g. perturbation, confidentiality)
Production of statistics	Statistical confidentiality and security	Safeguarding data security (e.g use screen saver when you leave the desk, transfer data through safe means, delete emails you don't trust etc.)
Production of statistics	Presenting and disseminating data	Planning dissemination of statistics (incl. understanding the user needs)
Production of statistics	Presenting and disseminating data	Tabulation of data
Production of statistics	Presenting and disseminating data	Visualization and presentation of data

Production of statistics	Presenting and disseminating data	Writing statistical reports
Production of statistics	Metadata and quality of statistics	Knowledge of the {United Nations National Quality Assurance Framework/INSERT NAME OF NSO's QUALITY STANDARD}
Production of statistics	Metadata and quality of statistics	Knowledge of the United Nations Fundamental Principles of Official Statistics
Production of statistics	Metadata and quality of statistics	Creating and curating metadata and classifications (incl. statistical documentation for users)
Production of statistics	Metadata and quality of statistics	Assessing the quality of statistical processes and products
Production of statistics	Data collection and processing software	Developing a CSPro application
Production of statistics	Data collection and processing software	Developing a Survey Solutions application
Production of statistics	Data collection and processing software	Developing a ODK application
Production of statistics	Data collection and processing software	Developing a Survey 123 application
Production of statistics	Data collection and processing software	Microsoft Access (development of a data collection application)
Production of statistics	Data collection and processing software	STATA
Production of statistics	Data collection and processing software	SPSS
Production of statistics	Data collection and processing software	SAS
Production of statistics	Data collection and processing software	R
Production of statistics	Data collection and processing software	Python
Production of statistics	Data collection and processing software	SQL
Production of statistics	Data collection and processing software	CSPro (processing)
Production of statistics	Data collection and processing software	Microsoft Excel (processing)
Production of statistics	Data collection and processing software	Microsoft Access (processing)
Production of statistics	Data collection and processing software	Eviews
Production of statistics	Data collection and processing software	ArcGIS
Production of statistics	Data collection and processing software	QGIS
Production of statistics	Data collection and processing software	Power BI
Production of statistics	Data collection and processing software	Data exchange standards (e.g. SDMX)
Statistics domains	Demography and social statistics	Demography and vital statistics
Statistics domains	Demography and social statistics	Migration incl. refugees and internally displaced people
Statistics domains	Demography and social statistics	Employment and unemployment
Statistics domains	Demography and social statistics	Statistic on other work activities incl. child labour and unpaid work (volunteering, unpaid domestic and care work)
Statistics domains	Demography and social statistics	Education
Statistics domains	Demography and social statistics	Health
Statistics domains	Demography and social statistics	Income and consumption
Statistics domains	Demography and social statistics	Social protection
Statistics domains	Demography and social statistics	Food security and nutrition
Statistics domains	Demography and social statistics	Human settlement and housing
Statistics domains	Demography and social statistics	Culture
Statistics domains	Demography and social statistics	Time use
Statistics domains	Governance statistics	Justice and crime
Statistics domains	Governance statistics	Political and other community activities (incl. Trade, civil society)

Statistics domains	Macroeconomic statistics	National Accounts
Statistics domains	Macroeconomic statistics	Regional Accounts
Statistics domains	Macroeconomic statistics	Sector Accounts
Statistics domains	Macroeconomic statistics	Satellite Accounts
Statistics domains	Macroeconomic statistics	Supply-and-use tables and input-output tables
Statistics domains	Macroeconomic statistics	Balance of payment and international investment position
Statistics domains	Macroeconomic statistics	Government finance
Statistics domains	Macroeconomic statistics	Monetary and financial statistics
Statistics domains	Macroeconomic statistics	System of Environmental Economic Accounting
Statistics domains	Business statistics	Short-term business statistics
Statistics domains	Business statistics	Structural business statistics
Statistics domains	Business statistics	Business demography and business dynamics
Statistics domains	Business statistics	Entrepreneurship
Statistics domains	Business statistics	Multinational enterprise statistics
Statistics domains	Other economic and business statistics	Agriculture
Statistics domains	Other economic and business statistics	Forestry
Statistics domains	Other economic and business statistics	Fisheries
Statistics domains	Other economic and business statistics	Mining, manufacturing and construction
Statistics domains	Other economic and business statistics	Transport
Statistics domains	Other economic and business statistics	Tourism
Statistics domains	Other economic and business statistics	Banking, investment and financial statistics
Statistics domains	Other economic and business statistics	International trade
Statistics domains	Other economic and business statistics	Prices
Statistics domains	Other economic and business statistics	Science, technology and innovation
Statistics domains	Energy and environment statistics	Energy
Statistics domains	Energy and environment statistics	Environment
Statistics domains	Cross-cutting statistics	Gender
Statistics domains	Cross-cutting statistics	Living conditions and poverty
Statistics domains	Cross-cutting statistics	Climate change
Statistics domains	Cross-cutting statistics	Information society and digitalization
Statistics domains	Understanding the sector within the statistics domain	Understanding the sector within the statistics domain
IT		Administering databases and networks
IT		Using cloud solutions
IT		Provisioning data security (e.g. protecting against cyber attacks, misuse, involuntary deletion, unauthorized access and loss of data)
IT		Planning for disaster recovery of data and maintaining back-up systems
IT		Scanning of paper questionnaires to electronic formats
IT		Programming, creating, and monitoring questionnaire instruments and applications
IT		Developing mobile applications
IT		Developing other applications (incl. artificial intelligence applications)

IT		Using/creating APIs
IT		Providing helpdesk and desktop support
IT		Managing hardware and software (e.g. licensing, installation, configuration)
IT		Procuring Information Technology
IT		Developing website
IT		Developing online dissemination database (also known as a databank or StatBank)
Communication and dissemination of statistics		Understanding the basics of statistics to be able to communicate about it
Communication and dissemination of statistics		Posting on social media
Communication and dissemination of statistics		Designing websites and managing content
Communication and dissemination of statistics		Writing engaging content
Communication and dissemination of statistics		Producing publications
Communication and dissemination of statistics		Developing infographics
Communication and dissemination of statistics		Understanding and communicating with users (e.g. journalists, politicians)
Communication and dissemination of statistics		Providing initiatives to increase statistical literacy
Finance		Understanding public finance regulations
Finance		Budgeting
Finance		Accounting
Finance		Advising on public procurement rules
Finance		Seeking and applying for fundraising (finance)
Finance		Using financial/accounting software
Finance		Conducting an audit
Human resources		Understanding human resource regulations
Human resources		Supporting recruitment and contracting
Human resources		Supporting management (e.g. motivation and career development of staff)
Human resources		Providing support with conflict resolution and crisis management
Human resources		Training and learning of staff
Human resources		Managing human resources incl. development of HR metrics and dashboard
Human resources		Using internal HR systems
Administrative and secretarial functions		Understanding public administration regulations
Administrative and secretarial functions		Using internal administrative software
Administrative and secretarial functions		Systematically storing information and documents

Administrative and secretarial functions		Managing contracts and agreements
Administrative and secretarial functions		Managing facilities and logistics
Management		Leadership skills (e.g. organizational change management, strategic planning, staff development and management, time allocation etc.)
Management		Seeking and applying for fundraising (management)
Management		Quality management
Management		Coordination within the statistics office
Management		Coordination with the national statistics system
Management		International statistical coordination
Management		Communication with external partners and policy makers
Management		Public speaking
Skills relevant for all staff	Understanding the statistical system	Knowledge about how the organization operates
Skills relevant for all staff	Understanding the statistical system	Knowledge of the legal frameworks relevant for producing official statistics
Skills relevant for all staff	Understanding the statistical system	Knowledge of privacy and confidentiality requirements
Skills relevant for all staff	Understanding the statistical system	Cooperating with the national statistical system
Skills relevant for all staff	Personal skills	Project and time management (e.g. scoping, risk management, task management, monitoring and evaluation, quality assurance)
Skills relevant for all staff	Personal skills	Teamwork
Skills relevant for all staff	Personal skills	Knowledge sharing
Skills relevant for all staff	Personal skills	Engagement with external partners
Skills relevant for all staff	Personal skills	Written communication techniques
Skills relevant for all staff	Personal skills	Presentation techniques - presenting for groups
Skills relevant for all staff	Personal skills	Facilitation techniques - running efficient meetings and workshops
Skills relevant for all staff	Software skills	Microsoft Word
Skills relevant for all staff	Software skills	Microsoft Excel
Skills relevant for all staff	Software skills	Microsoft PowerPoint
Skills relevant for all staff	Software skills	Online meeting tools (such as Microsoft Teams, Zoom etc.)