Scaling Up Health Workforce Education and Training:

Guide for Applying the Bottlenecks and Best Buys Approach

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DEFINITIONS

Academic program	A course of study that results in a certificate, diploma, degree, or other qualification. Includes an architectural design of learning content, which is multidimensional and includes intentions, structure of content, delivery modes, academic resources, and assessment modes.
Best buys	Solutions with the largest potential for impact with a relatively modest investment.
Bottlenecks	The challenges or obstacles that are preventing a school from achieving its scale-up goals for a particular academic program or programs.
Clinical preceptor	A practicing clinician, such as a physician or nurse, who gives practical instruction, training, and/or supervision to a student or young clinician, especially of medicine or nursing.
Educator	Any person responsible for student learning, including clinical supervisors and preceptors working at clinical facilities.
Health workforce educational institutions	Public or private medical, dental, pharmacy, nursing, midwifery, and other health sciences faculties and schools, as well as vocational training institutes for allied health professions.
Production capacity	The maximum volume of high-quality products or outputs that can be generated by an enterprise in a given period using currently available resources.
Purposive sample	A sample selected based on the knowledge of a population and the purpose of the study. The subjects are selected because of some predefined characteristics.
Social orientation	Business philosophy that takes the well-being of society into account in addition to satisfying the desires of customers.
Stakeholders	Persons, groups, or institutions that have an interest in the institution or its graduates.
Stakeholders (key)	Those stakeholders, both internal and external to the institution, who can significantly influence the bottlenecks and best buys process, or are important to its success, or both.
Stakeholders (primary, internal)	Those directly affected, such as administrators, teachers, students, and staff at clinical practice sites.

Stakeholders (secondary, external)	Those affected in an indirect or limited way, such as health care facilities, community organizations, professional associations, regulatory bodies, and ministries of health and education.

INTRODUCTION

Health workers are globally recognized as a cornerstone of efforts to improve health service coverage and achieve better health outcomes (World Health Organization [WHO] 2007). However, the world is currently facing a large and increasing shortage of skilled health professionals. In 2013, the Global Health Workforce Alliance (GHWA) and the WHO estimated a global deficit of 7.2 million doctors, nurses, and midwives—considerably higher than the 2.4 million deficit estimated by the WHO in 2006 (Campbell et al. 2013; WHO 2006).

Clearly, more health workers must be educated and trained—especially in Africa where the health needs are greatest. Unfortunately, the capacity to increase the supply of health workers is constrained by the limited number of educational institutions that produce health workers and the scarcity of resources available at those institutions to scale up education and training. For example, estimates in 2010 showed that sub-Saharan African countries alone need to add approximately one million workers to their health systems to provide universal coverage with an essential package of life-saving services, yet 26 of the 48 countries in Africa had only one medical school or none at all (Mullan and Frehywot 2010).

At the same time, questions have arisen about the quality and relevance of health workforce education and the adequacy of its financing. The Commission on the Education of Health Professionals for the 21st Century documented systemic deficiencies in health workforce education and training, emerging from a mismatch of health worker competencies to patient and population priorities primarily due to fragmentary, outdated, and static curricula producing ill-equipped graduates from underfinanced institutions (Frenk et al. 2010a and 2010b). According to the Commission's report, investments in health professional education represent less than 2% of the estimated $5.5 trillion in annual worldwide health expenditures, which the report's authors characterize as pitifully modest for such a labor-intensive and talent-driven industry (ibid.). To overcome these constraints, the Commission and the WHO have released specific recommendations for improving the performance of health professional education systems, principally through instructional and institutional health workforce education reforms (ibid.; WHO 2013).

Health workforce educational institutions include medical, dental, pharmacy, nursing, midwifery, and other health sciences faculties and schools, as well as vocational training institutes for allied health professions. Whether public or private, the majority of these institutions struggle to attract, retain, and graduate a sufficient number of competent and qualified health workers who will remain in their countries and work where needed, especially in rural areas and with underserved populations.

In 2010, the USAID-funded Capacity*Plus* project began developing and testing a methodology called the Bottlenecks and Best Buys Approach. The approach aims to ensure that investments in health workforce education are the most efficient and effective in producing quality health workers. Capacity*Plus* designed the approach to help educational institutions identify

bottlenecks to increasing the production of competent and qualified graduates that can be overcome through limited yet strategic investments. This guide draws from our experience of adapting and applying the approach in more than 30 nursing, midwifery, medical, health assistant, and community health extension worker schools, both public and privately owned, in seven African countries. Several early applications of the approach were funded by PEPFAR within the context of the Nursing Education Partnership Initiative (NEPI).

The guide describes two general options for applying the approach: internally led by a school; or externally led by a governmental or technical agency. It identifies the stakeholders who should be involved, the steps in conducting a bottlenecks assessment, and a method for using the results of the assessment to identify and build consensus on the most effective and affordable actions, or best buys, for overcoming bottlenecks to scale-up. The guide also provides tools and examples for strategic steps in the approach, such as engaging stakeholders, conducting a situation analysis, defining the school's scale-up goal, leading group interviews, analyzing the results, and presenting the final bottlenecks and best buys report to external stakeholders and potential investors.

No two countries have implemented the Bottlenecks and Best Buys Approach in exactly the same way. There have been variations in who leads the approach, the stakeholders involved, the methods and tools used, and the steps taken afterward. This guide aims to provide direction for implementing the approach without being too prescriptive. Throughout the process, it is important to remain focused on the overarching goal of the activity, which is to identify solutions for scaling up education and training that have the greatest potential for overcoming constraints using relatively small amounts of additional resources.

Target Audiences for This Guide

The intended audiences for this guide are:

1. **School leaders** in both public and private educational institutions, such as the dean of a faculty of health sciences, the director of a medical or nursing school, or the head of a department or academic program
2. **Representatives of national governmental organizations** such as the Ministry of Health or Ministry of Education
3. **National technical agencies, regulatory bodies, or associations** such as a national nongovernmental organization (NGO) focused on education or health, a national health professional council or association, or a national association of nursing or medical schools
4. **International technical agencies or associations** such as an international NGO, international professional council or association, or international association of nursing or medical education

5. **Donors and financing agencies** interested in investing in health workforce education, such as USAID, the African Development Bank, national development banks, and ministries of finance.

Overview of the Approach

The Bottlenecks and Best Buys Approach aims to support educational institutions, both public and private, to increase the production of quality graduates through limited yet strategic investments. The process involves assessing the production capacity of one or more academic programs and identifying the bottlenecks that impede an institution's successful acceleration of expansion. An academic program is a course of study comprised of learning content, delivery modes, academic resources, and assessment processes that lead to a recognized credential such as a certificate, diploma, degree, or other qualification. The results of the assessment are then used by school stakeholders, including managers or supervisors at clinical practice sites, to define priority actions (best buys) that have the greatest potential for overcoming constraints with relatively small amounts of additional resources.

The approach is particularly relevant if the leadership of an institution is planning to:

- Increase the number of graduates from an academic program
- Improve the quality of a program
- Introduce a new program, such as upgrading from a one-year midwifery certificate to a two-year diploma program
- Respond to a request or directive from an external body (such as the Ministry of Health) to scale up the quantity and/or quality of graduates from selected programs.

A number of key components must be present and functioning in order for educational institutions to produce quality graduates. These include students, educators, school management, facilities, materials, curricula, practicum sites, quality assurance mechanisms, and partnerships (see Box 1). The

Box 1: Nine Thematic Areas of Health Workforce Education

1. **Students** (recruitment, selection, retention, graduation, certification)
2. **Educators** (full/part time, classroom/clinical, recruitment, selection, retention, continuing development)
3. **Management** (income/expenditures, oversight/governance, including government relations with a school)
4. **Facilities and infrastructure** (classrooms, demonstration rooms, laboratories, libraries, computer labs, dormitories, cafeterias, electricity, water, Internet)
5. **Materials and equipment** (textbooks, teaching/learning materials, computers, anatomical models, simulators, diagnostic equipment, clinical supplies)
6. **Curriculum** (theoretical and practical aspects, alignment with health service delivery needs, regularly updated)
7. **Clinical practice** (variety and appropriateness of sites, quality of mentoring and supervision, availability of infrastructure and equipment)
8. **Quality assurance** (accreditation of institutions, certification/licensing of graduates)
9. **Partnerships and exchange** (exchange of faculty/students, partnerships between schools and with service delivery facilities, both public and private).

Bottlenecks and Best Buys Approach draws on information about these nine components from published and unpublished literature and frameworks on health workforce education (Bossert et al. 2007; Dal Poz et al. 2009; Ng, Newman, and Pacqué-Margolis 2012; Pacqué-Margolis, Ng, and Kauffman 2011; UNESCO 2009; WHO 2009, 2010a; WHO and World Federation for Medical Education 2005). The components are defined in detail in Annex 1.

Virtually all institutions that produce health workers may encounter bottlenecks within any one of these areas. Most educational programs can be placed into one of two groups: 1) those with bottlenecks in just a few of the nine areas requiring only limited, focused, and strategic investments; and 2) those with bottlenecks in most of the nine thematic areas requiring across-the-board investments to accelerate the production of quality health workers. Programs that fall into the first category, with a small number of bottlenecks, are more likely to benefit from the Bottlenecks and Best Buys Approach, where modest yet targeted investments can quickly enhance a school's capacity to scale up the production of graduates without loss of quality.

Suitable Programs

Educational programs with a small number of bottlenecks are most likely to benefit from the Bottlenecks and Best Buys Approach, which detects areas where targeted investments can quickly increase the capacity of a school to produce quality graduates.

Implementation of the Bottlenecks and Best Buys Approach occurs through a series of steps (see Table 1) that can address all nine thematic areas or a selected subset.

Table 1: Steps and Activities in the Bottlenecks and Best Buys Approach

Steps	Activities
1. Identify and engage key stakeholders	• Complete a stakeholder mapping exercise (Annex 2) • Inform key stakeholders about the Bottlenecks and Best Buys activity and request their support and involvement
2. Determine the focus of the bottlenecks assessment	• *Optional:* Conduct a rapid diagnostic of the social orientation and capacity for scale-up of one or more institutions (Annex 3) • *Optional:* If the approach is externally led, select the educational institution(s) for assessment • Meet with key stakeholders to decide if the bottlenecks assessment should focus on all nine thematic areas or a selected subset (Annex 1)

3. Conduct a bottlenecks assessment and summarize the results	• Form an assessment team
	• Adapt the assessment methods and tools
	• Complete situation analysis and summarize results (Annex 4)
	• Meet with key stakeholders to define the scale-up goal
	• Conduct individual or group interviews with school and clinic representatives to identify bottlenecks (Annex 5)
	• *Optional* (Annex 6):
	  ○ Survey students, educators, clinical preceptors, and/or instructors
	  ○ Complete structured observations of facilities and infrastructure
	  ○ Interview key informants external to the school
	• Summarize main findings in results analysis matrix (Annex 7)
	• Prepare a draft bottlenecks and best buys report (Annex 8)

Steps	Activities

4. Define best buys	• Meet with key stakeholders to:
	  ○ Reach a consensus on priority bottlenecks
	  ○ Define the solutions needed to overcome priority bottlenecks
	  ○ Estimate the cost of solutions and select best buys from among the costed solutions

5. Share the results with stakeholders and potential investors and plan next steps	• Update and finalize the bottlenecks and best buys report • Share the final report with persons and organizations that can help implement or finance the proposed best buys; if possible, conduct a stakeholder dissemination meeting to present the findings • Prepare a plan of action

OPTIONS FOR IMPLEMENTING THE APPROACH

Based on implementation experience, Capacity*Plus* found two common ways to initiate or lead the Bottlenecks and Best Buys Approach:

1. **Internally-led option**: The educational institution itself can **lead** the approach.
2. **Externally-led option**: A person or organization external to the institution can **initiate or lead** the approach with support and assistance from a focal person within the institution.

Regardless of who leads the initiative, the process of identifying bottlenecks and defining best buys is very similar, with only slight variations. In many situations, a hybrid or combination of both options can be used. For example, the initial steps of the approach might be externally led, while later steps are led by the institution.

In addition, several of the methods and tools described in this guide can be modified and applied by those with suitable expertise for the purpose of ***research or evaluation***. For example, the situation analysis tool could be used to describe the baseline situation at a school prior to introducing a scale-up program, and again after a certain period of time to evaluate the progress or results of the program. The scale-up program might be predefined by an external entity—such as the Ministry of Education—and implemented across a number of schools. In this example, all schools might be asked to increase their student intake by a certain percentage. Alternatively, a situation analysis might be conducted in several schools and the findings used to design a national or subnational scale-up program.

For any research or evaluation effort, the goals, scope, and methods must be clearly defined in advance, and the approach and tools carefully designed or adapted to meet those objectives. Therefore, we recommend that specialists in research or evaluation lead the process, using this guide as a reference for possible methods and tools that could be adapted and used in their efforts.

Option 1: Internally Led by the School

The leadership of an educational institution—such as the dean of a faculty of health sciences, director of a medical or nursing school, head of an academic program or department, or

supervisor at an associated clinical site—can recommend and lead the Bottlenecks and Best Buys Approach at his/her institution.

The primary benefit of an internally-led approach is that the process can be completed relatively quickly, especially if it omits the optional assessment methods, to rapidly establish a set of low-cost activities that would make the largest contribution to achieving the institution's scale-up goals for the academic program(s) under consideration. The potential disadvantages of an internally-led process are that the institution might not have a broad perspective on all potential solutions for overcoming bottlenecks, nor the power or authority to engage some key external stakeholders in the process—for example, representatives from the relevant professional council or from the ministries of health or education. Furthermore, the institution might not be able to implement some of the best buys without external assistance or collaboration with other schools. However, this should not prevent the institution from moving ahead. The institution can share the results (that is, the bottlenecks and best buys identified) with key external stakeholders afterward, with the aim of gaining their support or cooperation for implementing the best buys.

To ensure the successful completion of the Bottlenecks and Best Buys Approach and the application of its findings, it is essential that a focal person within the educational institution take responsibility for driving the process forward. The focal person, who could be the director or coordinator of the academic program under review, should be fully supported by the institution's leadership and administration, by the team assembled to conduct the bottlenecks assessment, and by the key internal and external stakeholders who are identified and engaged during the first step of the process. The assessment team should include individuals who are skilled in conducting interviews, focus group discussions, and surveys, and who are objective, neutral parties with regards to assessment outcomes (meaning they do not work in the academic program under review). Skilled, objective interviewers might be found at another school or faculty within the university or institute, such as a school of business, education, public health, or social science. Alternatively, they could be requested from an external entity, such as another educational institution, a local or international NGO, or the ministries of health or education.

Option 2: Externally Led

An external entity—such as a national Ministry of Health, state Department of Education, professional council, or NGO—can decide to apply the Bottlenecks and Best Buys Approach in one or more educational institutions. For example, organizations and agencies responsible for or interested in providing technical support or resources to help scale up an academic program can use the approach to identify where to target their technical support or investment.

The primary benefits of the externally-led option are increased objectivity and greater ability to identify and

Benefits of an Externally-Led Approach: An Example

In many countries, students apply for and are admitted to academic programs through a centralized application process external to the institution. If the bottlenecks assessment indicates that the student selection process should increase the number of students admitted from rural areas, those changes are more likely to be achieved if several schools are involved in the activity with national stakeholder group support.

implement solutions that are beyond the control of the school or require resources from other organizations or agencies. In addition, if the approach is applied at more than one educational institution, the results can be compared to identify similar challenges or bottlenecks across more than one school, and schools can be linked with each other to implement best buys. For example, common solutions can be applied to achieve greater economies of scale, such as training faculty or procuring materials for several schools at the same time. If an external team conducts bottlenecks assessments at more than one institution and follows up the assessments with a large stakeholder meeting, there is greater potential to identify high-impact solutions that can be implemented across several schools.

There are also some potential disadvantages of an externally-led approach. For example, the process may take longer; it might be more difficult to engage internal stakeholders in the process; and the leadership of the institution might feel less ownership and motivation to implement the recommended actions. For this reason, external facilitators should work closely with a focal person inside the educational institution to complete the steps in the assessment and ensure that its findings are applied. The focal person might be the director or coordinator of the academic program under review. The external facilitators also should be supported by the institution's leadership and administration, by the team assembled to conduct the bottlenecks assessment, and by key internal and external stakeholders who are identified and engaged from the first step of the process.

Table 2 lists the individuals or groups who should take responsibility for each activity when the approach is led by the educational institution, and those who should take responsibility when the approach is led by an external entity. The steps are the same, regardless of who leads the process. The remainder of the guide describes each activity in more detail.

Table 2: Options for Leading the Bottlenecks and Best Buys Approach

Activity	**Suggested persons responsible for the activity**	
	Internally led	**Externally led**
Step 1: Identify and engage key stakeholders		
Complete a stakeholder mapping	School focal person	External facilitator
Inform and engage key stakeholders	School focal person	External facilitator
Step 2: Determine the focus of the bottlenecks assessment		
Optional: Rapid diagnostic of institution(s)	School focal person	External facilitator
Optional: Select the educational institution(s) for assessment	N/A	External facilitator and key stakeholders
Choose the academic program(s) and thematic areas of focus	School focal person and key stakeholders	External facilitator and key stakeholders
Step 3: Conduct a bottlenecks assessment and summarize the results		
Form an assessment team	School focal person	External facilitator
Adapt the assessment methods and tools	School focal person and assessment team	External facilitator and assessment team

Activity	Suggested persons responsible for the activity	
	Internally led	**Externally led**
Complete a situation analysis	School focal person and assessment team	External facilitator and assessment team
Define the scale-up goal	School focal person and key stakeholders	External facilitator and key stakeholders
Interview leaders of the school and associated clinical sites	Objective interviewer	Objective interviewer
Optional: Survey students, educators, and clinical preceptors and/or instructors	Objective interviewer or data collector	Objective interviewer or data collector
Optional: Conduct structured observations of facilities and infrastructure	Objective observer	Objective observer
Optional: Interview key informants external to the school	Objective interviewer	Objective interviewer
Summarize findings and prepare draft report	School focal person and assessment team	External facilitator and assessment team
Step 4: Define best buys		
Reach consensus on priority bottlenecks	School focal person and key stakeholders	External facilitator and key stakeholders
Define solutions needed to overcome priority bottlenecks	School focal person and key stakeholders	External facilitator and key stakeholders
Estimate the cost of solutions and select best buys from among the costed solutions	School focal person and key stakeholders	External facilitator and key stakeholders
Step 5: Share the results with stakeholders and plan next steps		
Update and finalize the bottlenecks and best buys report	School focal person and assessment team	External facilitator and assessment team
Share results with people/organizations that can help implement or finance the best buys	School focal person and key stakeholders	External facilitator and key stakeholders
Prepare a plan of action	School focal person and key stakeholders	External facilitator and key stakeholders

STEP ONE: IDENTIFYING AND ENGAGING KEY STAKEHOLDERS

The success of any scale-up effort will depend on creating a culture and environment that encourages enthusiastic, competent, and committed participation by all groups or persons who have an interest in or influence on the institution's performance. The first step in the Bottlenecks and Best Buys Approach is, therefore, to identify and engage key stakeholders.

The main activities in this step are to:

- Complete a stakeholder mapping exercise (Annex 2)
- Inform key stakeholders about the Bottlenecks and Best Buys activity and request their support and involvement

- Engage key stakeholders at strategic points throughout the process (see Table 2).

Completing a Stakeholder Mapping

Those leading the approach, whether internal or external to the institution, should create a map of stakeholders and decide how different stakeholders should be involved in each step of the process (see Annex 2 for tools on how to map and involve stakeholders).

Key stakeholders are persons or groups both internal and external to the institution who can significantly inform and/or influence the bottlenecks and best buys process or are important to its success. They typically include, but are not limited to, the following:

- Dean or director of the faculty, college, or school
- Director or heads of relevant departments
- School registrar
- Head of academic affairs
- School senior administrator or finance officer
- At least one representative of:
  - Students
  - Teachers
  - Clinical tutors/supervisors
- Managers or supervisors at associated clinical practice facilities
- Representatives of national and local health and education authorities (e.g., national ministries of health and education, municipal departments of health and education)
- Representatives of local regulatory bodies for education and health (e.g., national health professional council, national quality assurance body for higher education)
- Potential donor agencies or investors.

Types of Stakeholders

Stakeholders are persons, groups, or institutions that have an interest in the institution or its graduates. Stakeholders include primary or internal stakeholders and secondary or external stakeholders.

Primary or internal stakeholders: Those directly affected, such as administrators, teachers, students, and staff at clinical practice sites

Secondary or external stakeholders: Those affected in an indirect or limited way, such as representatives of health care facilities, community organizations, professional associations, regulatory bodies, and ministries of health and education

Key stakeholders: Those stakeholders, both internal and external to the institution, who can significantly inform and/or influence the bottlenecks and best buys process or are important to its success

At a minimum, key stakeholders would include the dean or director of the faculty or school, the heads of the educational programs being assessed, and the managers of the health facilities where students complete clinical practice rotations. Because students are personally and directly affected by any changes to an academic program, involvement of student representatives as key stakeholders will greatly enhance the accuracy, appropriateness, and effectiveness of the process.

Informing and Engaging Key Stakeholders

Focused yet regular involvement of key stakeholders creates access to more information, which enhances the quality of decision-making, increases support for conclusions and recommendations, and facilitates changes or improvements. The focal person or facilitator for the Bottlenecks and Best Buys Approach should inform key stakeholders of the intent to carry out the process, and request their support and involvement. To ensure that the bottlenecks and best buys defined are relevant and meaningful and that there will be follow-up afterward to implement the findings, appropriate key stakeholders should be consulted and engaged at strategic points throughout the process (see Table 2), and especially to:

- Determine the focus of the assessment, including the selection of academic programs and areas for assessment (Step Two)
- Define the scale-up goal (Step Three)
- Prioritize bottlenecks, define solutions for overcoming them, and agree on best buys (Step Four)
- Share results with individuals and organizations that can support the implementation of the best buys (Step Five).

***Example*:** Capacity*Plus* conducted bottlenecks assessments of the nursing and midwifery programs at three colleges of health sciences in Ethiopia as a partner in PEPFAR's Nursing Education Partnership Initiative (NEPI). A national stakeholder group was created that included representatives of the Federal Ministry of Health, Federal Ministry of Education, schools of health sciences, the National Midwives Association, USAID, the Centers for Disease Control and Prevention (CDC), Columbia University's ICAP Nurse Capacity Initiative, and Capacity*Plus*. The stakeholder group contributed to a number of important decisions, such as selecting the schools to assess, determining the areas of focus for the assessment, prioritizing bottlenecks, defining actions to overcome them, and monitoring the implementation of school-specific scale-up plans. The group also worked to address issues beyond the control of the individual schools, such as the training of faculty.

Step Two: Focusing the Assessment

Before moving ahead with an assessment, important decisions must be made about which educational institutions should scale up activities; which academic programs within those institutions should be prioritized; and which aspects or thematic areas of those programs should be the focus of the assessment. The main activities in this step are to:

- Select one or more educational institutions in which to apply the approach (Annex 3)
- Choose the academic program(s) and thematic areas of focus (Annex 1).

Selecting the Educational Institution

Selection of an institution can be based on a number of factors, such as the geographical location of the school, the types of academic programs offered, or the disease burden trends in

the areas where graduates from the school are typically placed. If the bottlenecks assessment is led by an external entity, key external stakeholders—such as municipal, state, or national health and education authorities, and national professional councils—should be involved in selecting schools. These external stakeholders also can assist in formally requesting permission to conduct the assessment from the administrators of the educational institutions that are chosen.

> ***Example*:** Prior to conducting bottlenecks assessments in Nigeria, Capacity*Plus* consulted with national and state health authorities to select focus states with the most need for scaling up health workforce education interventions. States with the poorest health indicators, such as high maternal mortality rates, were given highest priority. Capacity*Plus* then collaborated with national and state authorities to select training institutions within those states that demonstrated the greatest potential for producing additional graduates.

A rapid diagnostic of a school's social orientation and capacity for scale-up can guide the selection of a school. The rapid diagnostic tool (Annex 3) measures the extent to which a school is oriented toward rural and underserved populations as well as its capacity for scale-up in each of the nine core areas of education. Schools with a focus on rural and underserved populations are more likely to produce graduates who will remain in a country and work in needed areas of health service delivery. Furthermore, experience in applying the Bottlenecks and Best Buys Approach has shown that educational institutions facing challenges in only a few of the core areas are more likely to benefit from the approach than institutions facing challenges in many core areas. In less challenged institutions, modest yet targeted investments can quickly enhance a school's capacity to scale up the production of graduates without the loss of quality.

> ***Example*:** The Uganda Capacity Program used a version of the rapid diagnostic tool in 2012 to identify a rural midwifery training school that showed the largest potential to benefit from the application of the Bottlenecks and Best Buys Approach.

Choosing the Programs and Thematic Areas to Assess

The type and number of programs assessed will depend on the context as well as the educational institution's need and ability to make changes in more than one program simultaneously. Key stakeholders within and outside the institution should be involved in these decisions. Where there is interest in focusing on more than one academic program, such as the undergraduate nursing and midwifery programs, if the same school administers the two programs it can be both feasible and appropriate to assess the two at the same time, especially if the programs share resources such as infrastructure and teachers.

The school focal person or external facilitator should call a meeting of key stakeholders to decide whether to focus the assessment on all nine areas or a subset. A review of the thematic areas in Annex 1 will help stakeholders decide where to focus the assessment. In order to ensure that the most essential bottlenecks are identified and addressed, it is recommended to include all nine thematic areas in the assessment. Stakeholders should very carefully consider the potential consequences of any decision to limit the assessment to only a few thematic areas (for

example, curriculum and clinical practice), because instructional and institutional components of an educational system are intricately linked. Any change in one thematic area is likely to affect one or more of the other areas. For example, if the assessment leads to a proposal to increase the number of hours of practice required (clinical practice area), this will likely also have an impact on the capacity of educators, school management, infrastructure, materials, and the curriculum. If challenges in those areas are not already known, it would be preferable to include them in the bottlenecks assessment.

Step Three: Conducting a Bottlenecks Assessment

The overarching goal of a bottlenecks assessment is to identify the challenges or bottlenecks that are preventing a school from achieving its scale-up goals for a particular academic program or programs. The assessment enables a school to analyze the nine thematic areas of a school's education system, in whole or in part, and identify bottlenecks within those components (see Box 1).

Whether led by the school itself or an external entity, the set of activities for the bottlenecks assessment is the same. They are:

- Form an assessment team
- Select and adapt the assessment methods and tools
- Complete a situation analysis and summarize the results
- Meet with key stakeholders to define the scale-up goal
- Conduct interviews or focus group discussions with school and clinic representatives to identify bottlenecks to achieving the scale-up goal
- If needed, administer optional surveys, observations, or interviews
- Prepare a preliminary report.

Senior administrators at the institution should be informed that the assessment team will be requesting documents and conducting long interviews with the dean or head of the school, the school registrar, the finance officer, and other school leaders, as well as with supervisors or managers of the clinical practice sites, including unit or ward managers. The assessment team should brief all stakeholders and senior administrators within the institution about the purpose of the bottlenecks assessment. If the team decides to survey students and teachers, school administrators should be ready to allow a sample of students and educators (both classroom and clinical teachers) to complete self-administered written questionnaires.

Communicating the Aims of the Assessment

It should be made clear to everyone involved that the information gathered through the bottlenecks assessment will be used to help the school identify strategies, interventions, and actions to overcome barriers to increasing the quantity and/or quality of graduates. They should be reassured that no punitive actions will be taken as a result of the assessment.

Key resources for conducting the assessment should be secured. These include:

- Sufficient copies of the assessment tools and informed consent forms
- A computer for recording the results of the situation analysis, interviews, and optional assessment methods
- Password-protected flash disks for storing and transferring data
- A voice recording device with sufficient storage space and batteries.

Forming the Assessment Team

The assessment team is responsible for managing the bottlenecks assessment and ensuring that its results are appropriately documented, shared, and used. The team will lead the adaptation of the assessment methods and tools; obtain ethics clearance from the appropriate review board (e.g., internal institutional review board, external national ethics review committee); brief all stakeholders—including faculty and students—before and after the assessment; ensure confidentiality and informed consent of all persons interviewed or surveyed; and effectively manage, store, and analyze all information and data collected to ensure confidentiality and valid results.

Internally-led assessment

If the approach is led by the educational institution, the school focal person should take responsibility for assembling the assessment team. Specifically, the school focal person should engage the support of three to five individuals who are available and able to adapt the assessment tools, conduct the assessment, analyze the results, and write a report. The team should include at least two individuals who are neutral and external to the academic program under review and able to conduct interviews and, if needed, focus group discussions or surveys of students or teachers. Involving objective assessors who are neutral external parties will allow the team to obtain accurate responses, particularly to sensitive questions about the challenges the program is facing. As previously noted, external assessors can be found in other departments or schools within the same institution (for example, schools of business, communications, education, or social sciences) or other organizations such as nearby universities, local health or education agencies, or relevant local NGOs.

Externally-led assessment

If the approach is led by an external entity, a similar team should be assembled, consisting of an assessment leader and three to five team members who are available and able to perform the tasks of adapting the tools; conducting interviews, surveys, or focus group discussions; analyzing the results; and producing a report. The external team will need the support of the school's senior administration and engagement of at least one dedicated focal person within the school, such as the head or director of the academic program under review. If the senior administration of a school is not informed and supportive, a bottlenecks assessment should not be conducted.

If an external entity is assessing several institutions, it should coordinate with the appropriate national or local authorities, such as the Ministry of Health or Ministry of Education, in the

planning and conduct of the assessment. These authorities can send a formal letter to the head of the educational institution to explain the purpose of the assessment, state their support for the activity, request approval, and introduce the assessment team. The assessment team should carry this letter of support throughout the assessment.

Adapting the Methods and Tools

During Step Two, key stakeholders met to agree on the focus of the assessment, including the thematic areas of focus (see Table 1) and the factors under each thematic area to assess (see Annex 1). Based on the decisions made by key stakeholders, the assessment team should then select and adapt the relevant methods and tools for the bottlenecks assessment. This should involve pretesting the interview or questionnaire tools to ensure the questions are understandable. If the results of the assessment will be shared externally or published, then the proposed methods and tools should be submitted to an internal institutional review board (IRB) for ethical clearance.

Core methods and tools

The core methods and tools, which are standard for every bottlenecks assessment, are:

- A situation analysis of the academic program(s) under review at a school (Annex 4)
- Individual or group interviews or focus group discussions with representatives of the school and its associated clinical sites (Annex 5)
- Informed consent forms (Annex 9)
- Results analysis matrix (Annex 7).

If the assessment team and key stakeholders decide that additional information is needed to clarify or validate the findings of the situation analysis and interviews with school and clinic representatives, then additional optional methods can be applied (Annex 6). It is recommended, however, to complete the situation analysis and interviews before deciding if additional information from the optional methods is needed.

The tools are capable of assessing several schools at the same time. If more than three academic programs are assessed within a single school, additional response tables must be added to the situation analysis form. Specific adaptation instructions are provided in the annex with each tool. In general, the assessment team should adapt the tools to the local needs and context in the following ways:

- Select the thematic areas to be assessed (see Table 1)
- Add or remove factors under each thematic area to be assessed (see Annex 1)
- Ensure that all tools use terminology that is appropriate and understandable to the respondents
- Revise the informed consent form (Annex 9) for each tool to accurately reflect the purpose and expected outcomes of the assessment.

The revisions that the assessment team makes to a given tool might include deleting entire sections of a questionnaire or adding and deleting questions within a section. The assessment team should ensure that changes to the thematic areas are reflected in all tools, starting with the situation analysis and interviews with school and clinic representatives, and finishing with the results analysis matrix and draft report.

> ***Example*:** To address critical constraints to nursing school curricula and infrastructure in Mali, Capacity*Plus* followed a step-wise approach to applying the Bottlenecks and Best Buys Approach. Local stakeholders initially decided to concentrate on five of the nine thematic areas: infrastructure, equipment and materials, curricula, educators, and management. After activities were underway to address crucial bottlenecks in those areas, the focus of the approach gradually expanded to include aspects of other thematic areas, such as students, clinical practice, quality assurance, and partnerships and exchange.

The assessment team should ensure that the terminology and guidance used in the tools is understandable and relevant to the local and institutional context. Different terms are used in different contexts. Using the correct terminology for a specific context helps avoid confusion among respondents. For example, in some programs the individuals who supervise clinical practice are called preceptors; in others, they are referred to as tutors or supervisors. Academic programs might be located in a college in one setting and school or training institute in another. The resulting credential might be called a certificate, diploma, or degree. Thus, the assessment team should read through the tools and correct the terminology as needed. In addition, in some of the tools the assessment team will need to fill in selected information about the context. For example, the scale-up goal agreed to by key stakeholders (process for defining scale-up goal described below) as well as a brief summary of the findings from the situation analysis should be inserted into the guide for interviewing representatives of the school and affiliated clinical sites.

The assessment team should review the informed consent form for each tool that will be used in the assessment. If needed, the team should revise the forms to ensure that they accurately reflect the purpose and expected outcome of the tools and assessment. During the assessment, all participants of interviews, focus group discussions, or surveys should be individually informed of the assessment objectives and requested to sign an informed consent form (see Annex 9).

If changes are made to the assessment tools, corresponding changes must be made to the results matrix used to analyze and compare findings across different methods (Annex 7), including revising the text in the matrix columns to reflect the methods that will be used and in the rows to reflect the thematic areas and factors that will be assessed.

Pretesting tools

After adapting an interview guide or questionnaire, the assessment team should pretest the tool to ensure that the questions are valid, reliable, and understandable. Pretesting can help to identify questions that don't make sense to participants or problems with the questionnaire that might lead to biased answers. Pretesting should not require a lot of time and resources, however. Even pretesting with one person is better than no pretesting at all.

How to Pretest a Questionnaire

- Administer the questionnaire to up to five people who resemble or are drawn from the population of interest.
- While the participants are completing the interview or survey, ask them to think out loud. Each time they hear or read a question, they should tell you exactly what comes into their mind. Take notes on everything they say. For example, they might say:
  - "I don't understand this question."
  - "Why are you asking me about that?"
  - "The response option I want isn't available."
  - "This is getting boring—why is it taking so long?"
- If the tool is a self-administered questionnaire, observe the participant while s/he is completing the survey. Look for places where the participant hesitates or makes mistakes, or ask the participants to note questions they do not understand or do not feel comfortable answering.
- Measure how much time it takes to complete the interview or questionnaire.
- Use the information gathered during the pretest to clarify instructions to interviewers or participants, change the wording of problem questions, reorder questions, reduce the number of questions, and improve or add response options where necessary.

Ethics clearance

In most situations, ethics board approval will be needed before moving ahead with the assessment. For an internally-led assessment, clearance from the IRB of the educational institution is sufficient. For an externally-led assessment, it might also be necessary to seek clearance from an external review board such as a national ethics review committee. Team members may need to contact the appropriate committee to request more information, including the format and types of information required for submission. After making a submission to the board or committee (if necessary), the team will have to wait for the results before beginning the assessment.

Conducting a Situation Analysis

The situation analysis aims to clearly and comprehensively describe the academic program(s) under review. It should be completed prior to interviews or focus group discussions with school and clinic representatives, and should not begin until the assessment team has obtained necessary clearances for the assessment and briefed all key stakeholders and senior administrators within the institution about the purpose of the bottlenecks assessment.
The tool provided in Annex 4 can gather information from several different schools. In addition, more than one academic program can be assessed simultaneously within the same school. For example, information on a school's pharmacy degree and pharmacy technician diploma programs can be collected at the same time. However, if more than three related academic programs are assessed in a school, then additional response tables should be added to the

situation analysis form. The situation analysis gathers details on all nine thematic areas of education. Examples include:

- Number of students and teachers in each program
- Student dropout and graduation rates
- Teacher turnover rates
- Sources of revenue for the school
- Types and quality of infrastructure and materials used
- Number and quality of clinical practice sites
- Proportion of graduates who pass certifying exams
- Number of students and teachers who have participated in educational exchanges with other countries or institutions.

In addition to documenting core information, the questionnaire in Annex 4 requests the school's leadership to attach relevant supporting documents, if available. These include copies of the school's organizational chart, relevant policies for student and educator recruitment and retention, and a list of clinical practice facilities. Some of the information might be difficult to obtain. For example, some schools either do not keep records on the number of students who drop out of a program and the reasons why they dropped out, or do not have records that are easily accessible. Therefore, the amount of time required to complete the situation analysis can vary from two days to more than two weeks.

The school focal person for the bottlenecks assessment must be willing and able to lead the situation analysis and involve as many key stakeholders as possible in order to gain a thorough understanding of the strengths and challenges of the academic program. A broad range of information is needed from several different institutional units and sources. The persons involved in completing the situation analysis should include, but are not limited to:

- The dean or head of the school
- The head or director of the academic program (e.g., medicine, nursing, midwifery, pharmacy)
- The school registrar
- The head of academic affairs
- The school senior administrator and/or finance officer
- Supervisors or managers at clinical practice facilities.

When school leaders conduct their own situation analysis, they develop a thorough understanding of the educational components required to deliver the academic program under review, and gain insight into how those components currently facilitate or hinder the delivery of the program. The facts gathered through the situation analysis questionnaire inform and

validate the definition of bottlenecks and the identification of interventions or actions needed to overcome the bottlenecks.

After completing the situation analysis, the team should summarize findings at the end of each section (thematic area) of the tool. The summaries should be copied and pasted into the appropriate sections of the interview guide as background information for defining bottlenecks.

Defining Scale-Up Goals

In most cases, the school leaders or external stakeholders will define a broad scale-up goal prior to conducting a bottlenecks assessment. For example, the Ministry of Health or Education might set a goal to increase the number of graduates from a particular program, such as a midwifery program.

Scale-up goals should support the vision and mission of the institution under review. They should reflect not only what an academic program is trying to achieve in the long term, but also in the short term, with short-term scale-up goals contributing to the achievement of the more general, long-term goal. For example, a school's leadership and key stakeholders might set a long-term goal to produce more graduates from a particular academic program who demonstrate certain competencies and characteristics. To achieve this overarching goal, the school's leadership might set several shorter-term goals, such as opening a new degree program, admitting additional students, providing more opportunities for student clinical practice, or incorporating a community orientation or rotation into the curriculum.

The assessment team should summarize the results of the situation analysis and present them to a group of key stakeholders with the aim of reaching consensus on the scale-up goals for the program(s) under review. An external facilitator can assist key stakeholders of a school—during a stakeholder meeting, for example—in defining long-term and short-term scale-up goals. Alternatively, relevant internal leaders can facilitate the process.

Goals set by the school should align with and respond to the expectations and needs of the local health workforce. For this reason, representatives from the local health agencies and health services that will eventually employ graduates should be consulted when defining a school's scale-up goals. Furthermore, the school leadership should review relevant subnational or national human resources for health policies, strategies, and/or plans, if they exist, to determine which types of health professionals are most needed in the country.

Goal statements are referenced throughout the process of identifying bottlenecks and also when evaluating the school's progress toward overcoming those bottlenecks. Therefore, the goals should be measurable so that they can be used to determine the success of any changes made as a result of the Bottlenecks and Best Buys Approach.

Examples of measurable goals, which will likely require varying levels of new investment and resources, include:

- Reduce dropout rates from an academic program by X%
- Decrease the numbers of students who repeat courses by X%
- Increase the proportion of students from rural or underserved backgrounds by X%
- Increase the number of graduates from an academic program by X%
- Increase the proportion of graduates who pass local licensing or certification exams by X%
- Increase the proportion of graduates who take up initial positions in rural or underserved areas by X%.

***Example*:** After conducting a rapid situation analysis at seven schools of basic midwifery, two schools of nursing, and four schools of health technology in Nigeria, Capacity*Plus* met with key stakeholders, including representatives from the schools as well as state-level health and education authorities, to define the scale-up goals for the schools. The group agreed on an overarching goal to increase the number of graduates from the programs. Because the situation analysis found that approximately 50% of students who enroll in the programs either drop out or fail the certification exam, the group also agreed on a short-term goal of decreasing dropout rates. The short-term goal of decreasing dropout rates permitted the group to focus its analysis and prioritization of bottlenecks on the challenges most closely associated with students dropping out or failing exams, such as financial difficulties in the final year of studies and inadequate development of competencies required to pass exams.

Interviewing School and Clinical Facility Representatives

Interviews with selected representatives of the school and affiliated clinical sites aim to produce a list of bottlenecks that are hindering the school from achieving its scale-up goals. The interview guide in Annex 5 leads the assessment team through a process of briefly summarizing the results of the situation analysis; asking a series of questions in each thematic area; reminding the participants of the scale-up goal; and asking participants to identify challenges to achieving that goal. This activity can be conducted as a series of individual interviews, as group interviews, or as focus group discussions.

The same school leaders and administrators who contributed to collecting information for the situation analysis should be targeted for the interviews or focus group discussions with school and clinic leaders. At a minimum, the leaders will include the dean or head of the faculty or school, the heads or directors of relevant academic programs, the registrar, the head of academic affairs, the senior administrator or finance officer, and supervisors or managers at clinical practice facilities. If the school leadership recently completed the situation analysis, they will already be aware of the range of factors under each educational component that should be considered when defining bottlenecks, and how those factors currently facilitate or hinder the delivery of the academic program(s) under review. In addition to the interviews with leadership and administration, the team should interview a small group of students representing each year of the program and, if possible, a balance of male and female students, as well as a sample of classroom teachers and clinical tutors or supervisors.

If the team uses group interviews or focus group discussions, participants should be divided into several distinct groups to allow participants to more candidly express their views:

1. Representatives of school and clinic leaders and administrators
2. A sample of classroom teachers and supervisors or tutors from affiliated clinical facilities
3. Several student representatives.

All interview or focus group participants should be assured of the full confidentiality of the information that they provide and asked to sign an informed consent form. No names should be recorded in the interviews. The consent form explains the purpose of the assessment and ethical considerations such as the role of the participant, right to refuse to participate, confidentiality, known benefits and risks of participation, and a point of contact for any questions the participant may have (see sample in Annex 9). This information must be read to, or by, each participant. Verbal consent should then be sought by the interviewer, after which the box at the bottom of the consent page is checked. Respondents should be able to freely decide to opt in or out of the interviews. Should respondents express concerns, they can be reminded that their name will not appear in any reports or presentations and that the information they provide is completely confidential.

Data Collection

It is best if interviews, focus group discussions, and surveys are conducted by skilled interviewers or data collectors who are external to the academic program under review to ensure that the assessment collects candid and objective responses. Skilled interviewers or data collectors can be identified within the larger institution—for example, from a department of sociology or business within the same university—or from an external organization or institution.

At least two objective, skilled, and competent facilitators from outside the school should lead the interviews or focus group discussions (see Forming the Assessment Team). Responses to the questions in the interview guide can be recorded directly in the electronic file, with separate files for school and clinic leaders, educators, and students. Depending on the method used (interviews or focus group discussions) and the number of people interviewed, it can take from one to three days to complete the interviews.

Interviews

Individual and group interviews should be conducted by teams of two facilitators in a quiet, private section of the school or clinical practice facility, and at a time that minimizes interruption of educational processes or health service delivery. One interviewer should ask the questions while the second interviewer records the responses in writing and also using an electronic recording device.

Group interviews can gather large amounts of information more quickly than individual interviews. In addition, a group setting may foster more in-depth discussion. However, some participants may dominate the conversation, and other participants might be reluctant to speak up in the presence of others. For this reason, it's important to create groups and choose

interviewers that increase participant comfort, for example, by forming separate groups for students, teachers, and school leaders.

In both individual and group interviews, the interviewers should maintain a warm and friendly attitude and remain nonjudgmental in their verbal responses or body language. If a respondent gives a vague answer, the interviewer should probe with questions like "Could you say a little more about that?" or "Would you give me an example of what you mean?" The interview guide contains open-ended questions that are designed to be thought-provoking and reflective. Respondents should be encouraged to answer with as much detail as they are able to provide.

Focus group discussions

Focus group discussions require a higher level of technical expertise to conduct than group interviews. If this method is used, the assessment team should engage expert focus group discussion moderators from within the institution or from an external organization. The focus group moderator must be able to create a friendly, nonthreatening environment and have good moderation skills, in particular the ability to unobtrusively control self-appointed experts, dominant talkers, and ramblers, while drawing out the more reticent participants. The co-moderator should take verbatim notes and record the session on an electronic recording device. Similar to an interview, the moderator should express neither positive nor negative judgment about the responses given, avoiding phrases such as "That's good" or "Excellent." In addition, the moderator should use pauses and probes such as "Would you explain further?" to encourage the group to elaborate on its responses. Prior to the discussion, both moderators should carefully review the school's scale-up goal statements and the results of the situation analysis to ensure that they have a clear understanding of the academic programs under review and the probable bottlenecks that the school faces.

Focus Group Discussions

A focus group discussion is a carefully planned discussion designed to explore perceptions on a defined area of interest in a nonjudgmental and nonthreatening environment. It should include up to 12 people and can last from one and a half to two hours. A typical focus group study has a minimum of three focus groups.

It is not within the scope of this guide to offer detailed instructions on conducting a focus group discussion. For further details on standard focus group procedures, see Kitzinger (1995) and Krueger (1994).

***Example*:** During a bottlenecks assessment of five public and private training schools in Mali, the decision was made to consider students' perspectives through the use of focus group discussions. The assessment team developed a focus group discussion guide for students, and two student focus groups were conducted by an expert facilitator at each institution.

Administering Optional Surveys, Observations, and Interviews

If the assessment team feels that additional information is needed to clarify or validate the findings of the situation analysis and interviews, the team should first conduct brief follow-up

interviews with school leaders, teachers, or students. In most cases, informal follow-up is sufficient to fill information gaps. However, if there is significant concern that the preliminary list of bottlenecks is biased, incorrect, or insufficient, the assessment team can then choose to apply one or more of the optional methods to further explore key stakeholder opinions about the strengths and weaknesses of the academic programs under review.

> *It is recommended to complete the situation analysis and interviews with school and clinic representatives before deciding if additional information from the optional methods is needed to clarify or validate priority bottlenecks.*

There are three optional methods (see sample tools in Annex 6):

- Survey a sample of students, educators, or supervisors at clinical practice sites
- Conduct structured observations of the availability and condition of facilities, infrastructure, equipment, and materials
- Interview key informants outside the educational institution.

If an external team is assessing more than one school, the team should conduct the situation analysis and interviews at one pilot school and analyze the results. Based on the experience at the pilot school, the assessment team should decide if additional information should be collected through one or more of the optional methods. It is important to remember that the team can fill information gaps or validate findings simply by returning to representatives of the school and clinics to ask additional questions.

Additional time, resources, and skills will be needed to adapt, implement, and analyze the findings of any optional method. When reviewing and adapting the optional tools, it is recommended to focus the questions on key areas of concern for the academic program under review in order to keep the surveys as short as possible. This will simplify both their administration and analysis. Each adapted tool also should be pretested prior to its use with a larger group of participants (see Adapting the Methods and Tools). As with other methods, informed consent from all participants is needed before conducting any survey, structured observation, or interview. Responses should remain confidential, and no names should be recorded in the survey or interview questionnaires.

***Example*:** In the Democratic Republic of the Congo, teams of five data collectors—including representatives from the ministries of health and education as well as the national nursing and midwifery associations—carried out bottlenecks assessments of the nursing and midwifery programs at seven institutes of health sciences across the country. Each team visited a school for three days to administer a situation analysis, conduct interviews with school and clinical facility leaders, survey students and educators, and observe school and clinical facilities.

Optional: Self-administered surveys of students, educators, or clinical supervisors

The sample questionnaires in Annex 6 focus on gathering the perceptions of students, educators, and clinical supervisors in areas where their opinions might differ from or supplement the opinions of the school's leadership. For example, whereas the school's leaders might report that there are no problems with gender discrimination at the school, a survey of educators might reveal that educators have a different opinion. School leaders might report that all educators are fully qualified in learner-centered teaching, but a student survey might find that students are not satisfied with the educational approaches used by their teachers.

If the assessment team decides to conduct a self-administered, paper-based survey of students, educators, or clinical supervisors, then the survey should be administered and analyzed by a person from outside the school. A purposive, heterogeneous sample should be selected. For example, the student survey should include an equal ratio of male and female students from all academic years of study, comprising at least ten students (if possible, five male and five female students) from each year of study. Instructions for selecting a sample are included with each tool. As with any survey data, all hard copies of the completed questionnaires should be stored in a safe place with the school's name.

The surveys are optional for several reasons. The assessment team may decide that the interviews with students and educators are sufficient, or the school leadership may be using other methods to stay informed about the opinions of students and educators, or the resources may not be available to effectively administer and analyze a survey.

Optional: Structured observation of facilities, infrastructure, equipment, and materials

Structured observations aim to validate the information gathered through the situation analysis and interviews. Using a standardized checklist, they collect data on the infrastructure and equipment of the training institution and its affiliated clinical training sites. Annex 6 includes two formats for structured observations: one for observing a school's facilities, infrastructure, equipment, and supplies; and another to observe clinical training facilities.

Optional: Interviews with key informants outside the educational institution

Interviews with key informants outside a school can furnish a useful external perspective of a school's bottlenecks. Stakeholders that can be targeted for key informant interviews include:

- Local health authorities (e.g., national or subnational representatives of ministries of health)
- Local education authorities (e.g., national or subnational representatives of ministries of higher education)
- Presidents and representatives of local professional associations or councils
- Health service managers (of both public and private services), particularly those where students are likely to be employed after graduation
- Clients/service users.

Preparing a Preliminary Report

The assessment team should summarize the main findings in a results matrix (Annex 7) and draft a bottlenecks and best buys report (Annex 8). The report should list the bottlenecks identified within each thematic area assessed. It will serve as the basis for a postassessment meeting with key stakeholders to discuss and reach consensus on the priority bottlenecks, and agree on a set of best buys for overcoming them.

Analyzing the results

The assessment team should review the information collected through the situation analysis; interviews with students, educators, and school leadership; and, if used, the optional surveys, interviews, or structured observation of facilities, equipment, and materials. If the team used self-administered surveys, it should complete a quantitative analysis of the responses.

The matrix in Annex 7 should be adapted to reflect the thematic areas and methods included in the assessment and used to summarize key findings from each assessment method in order to help the assessment team to compare key findings and identify bottlenecks. For example, the summary sections at the end of each thematic area of the situation analysis should be used to populate the first column of the results analysis matrix.

During the situation analysis, the assessment team should have collected copies of relevant local standards for the educational programs and/or schools under assessment (see section nine of the situation analysis questionnaire on quality assurance and accreditation). If local standards exist, the assessment team should review and compare those standards with the bottlenecks identified through interviews with school and clinical facility representatives, as well as with responses to optional observations of facilities and surveys of students and educators. If certain standards are not being met by the program or school, but were not identified as bottlenecks in interviews, observations, or surveys, those standards should be described in the preliminary report. The assessment team should present any standards that the school is having difficulty achieving to stakeholders during step four of the Bottlenecks and Best Buys process; and, if agreed, refine some of the bottlenecks or define additional bottlenecks based on those standards.

In addition, the assessment team should review relevant regional and global recommendations and standards, such as the following:

- WHO guidelines for transforming and scaling up health professionals' education and training (http://whoeducationguidelines.org/content/guidelines-order-and-download)
- *The Lancet* commission report and article on transforming education to strengthen health systems in an interdependent world (http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(10)61854-5; and http://www.iamp-online.org/sites/iamp-online.org/files/healthprofnewcentreport.pdf)
- WHO recommendations for increasing access to health workers in rural and remote areas (http://www.who.int/hrh/retention/guidelines/en/)

- WHO standards for nursing and midwifery education (global: http://www.who.int/hrh/resources/standards/en/; Africa region: http://www.afro.who.int/en/clusters-a-programmes/hss/human-resources-for-health/hrh-publications.html)
- World Federation for Medical Education standards for basic medical education (http://wfme.org/standards/bme).

Standards and recommendations from relevant regional and global documents can be compared with the results of the interviews, observations, and surveys to help refine the list of preliminary bottlenecks.

If more than one school is applying the Bottlenecks and Best Buys Approach at the same time, the analysis matrix for each school can be compared to help identify similarities and differences across several schools, particularly in the lists of bottlenecks identified under each thematic area.

During the analysis, it is important to ensure that all hard copies, computer files, and audio files for the situation analysis, interviews, and optional assessment methods are stored in a safe place, such as a folder locked in a cabinet or a password-protected thumb drive with the school's name. Backup copies should be made of all computer files. It is unethical and prohibited to share the raw data and information collected through the assessment.

Drafting a report

The assessment team can use the template in Annex 8 to draft a preliminary Bottlenecks and Best Buys report. Sections one through five of the template describe the program(s) under review, the scale-up goal defined by key stakeholders, and the results of the bottlenecks assessment. The preliminary report, and particularly the lists of bottlenecks under each thematic area, will guide discussions with key stakeholders to define priority bottlenecks, actions for overcoming them, and best buys from among those actions.

The preliminary report should include a clear description of the academic program or programs under review, which can be pulled from the first section of the situation analysis. The report can also include a brief summary of the findings from the various methods (e.g., situation analysis, interviews, surveys, observations) to support the bottlenecks identified. Alternatively, the report can simply refer readers to the results matrix, which can be attached to the report as an annex. No names or personal identifiers of interview or survey participants should be included in the report.

If bottlenecks assessments are conducted at more than one school at the same time, a synthesis report should be prepared that includes a comprehensive summary of all programs reviewed and identifies common bottlenecks found in more than one school. The synthesis report can be used to guide a group of relevant stakeholders in identifying best buys that can be implemented across several schools.

***Example*:** In Ethiopia, a synthesis report was prepared to summarize the findings of the bottlenecks assessments of the nursing and midwifery programs at three colleges. The report was used to inform a meeting of national stakeholders to identify priority bottlenecks and best buys across the schools.

If time permits, the preliminary report for each school and, if applicable, the synthesis report containing the results of several schools should be shared with key stakeholders for review and validation prior to commencing Step Four, which involves conducting a stakeholder meeting to prioritize bottlenecks and define interventions or actions for overcoming them. Once the step of defining best buys is complete, the remaining sections of the report template can be filled in, and the report can be finalized (see Defining Best Buys and Producing a Final Report and Sharing the Findings).

Step Four: Defining Best Buys

Best buys are solutions with the largest potential for impact with a relatively modest investment. Those leading the Bottlenecks and Best Buys Approach should meet with key stakeholders to discuss and prioritize the bottlenecks identified during the assessment, define solutions for overcoming them, and develop a set of best buys.

The main activities in this step are to:

- Reach a consensus on priority bottlenecks
- Define solutions needed to overcome priority bottlenecks
- Estimate the cost of solutions and select best buys from among the costed solutions.

These activities can be completed in a single stakeholder meeting or in two separate meetings. Two separate meetings allow time between gatherings to estimate the feasibility and costs of the possible solutions identified during the first meeting before presenting them to the key stakeholders who will agree on the final set of best buys. In some contexts, it may not be feasible to organize two separate meetings, especially if the approach is being applied at more than one school and some stakeholders need to travel to attend the meetings. In this case, rough estimates of the cost of solutions can be calculated during a single stakeholder meeting and used to identify best buys.

Different approaches to consensus-building can be used to reach group decisions. Previous applications of the Bottlenecks and Best Buys Approach have relied on nominal group technique to achieve rapid consensus (CDC 2006). If nominal group methods are not acceptable in a particular context, then an alternative approach for consensus-building can be selected (Kaner et al. 2011; Susskind, McKearnan, and Thomas-Larmer 1999).

Reaching Consensus on Priority Bottlenecks

Priority bottlenecks are the obstacles that pose the greatest challenge to achieving the scale-up goals for the academic program(s) under consideration. During a meeting of key stakeholders, a facilitator should present the scale-up goal that was defined during the bottlenecks assessment, share the list of bottlenecks identified during the assessment, and define what is meant by a priority bottleneck. The facilitator can then guide key stakeholders through a process of consensus-building or group decision-making with the goal of reaching agreement on priority bottlenecks. Box 2 outlines how nominal group technique can be used to reach consensus on priority bottlenecks.

Box 2: Nominal Group Method for Building Consensus on Priority Bottlenecks

1. ***Generate ideas:*** *The moderator presents a question or problem to the group in written format and asks group members to individually write down a predefined number of responses.* To generate ideas around priority bottlenecks, the moderator reminds the group of the previously defined scale-up goal and presents or circulates the list of bottlenecks generated by the assessment. The moderator then asks a question such as, "If you had $10,000, which of these bottlenecks would you spend it on?" Each participant in the meeting writes down on a small sheet of paper up to three priority bottlenecks in response to this question. Participants then give the sheets of paper with their responses to the moderator.
2. ***Record ideas:*** *The moderator writes the individual ideas generated by the group on a flip chart or white board that is visible to the entire group*. The bottlenecks listed by each group member should be recorded on the chart for everyone to see. Each bottleneck should be listed only once, even if several members of the group select the same bottleneck.
3. ***Discuss ideas:*** *The group discusses the bottlenecks.* The moderator could ask, "Are there any questions or comments about why any of these bottlenecks have been selected as priorities?" This step provides an opportunity for members to explore the rationale behind the selection of specific bottlenecks. Group members should not feel compelled to justify or defend their selections, however.
4. ***Vote on ideas:*** *Individuals further prioritize the ideas.* If there is a need to reduce the list of priority bottlenecks, the group can individually vote on each item in the list. There are many ways of voting. One way is for each person to privately rank their priority bottlenecks between one and five, with one being lowest and five being highest. After group members assign scores, the scores are tallied, and the five to ten bottlenecks with the highest scores are selected as the top priorities. Another simple voting technique is to ask participants to place a check mark next to five bottlenecks they believe are the most important. The facilitator counts the check marks next to each bottleneck and lists the bottlenecks in order of check marks received. The bottlenecks that receive the highest number of votes go to the top of the list and those with the lowest number go to the bottom. The top priority bottlenecks proceed to the next stage in the process of defining best buys.

The example in Table 3 shows how the nominal group process led to a consensus on priority bottlenecks for a health assistant training program with a scale-up goal of admitting an additional 100 students each year. Voting resulted in agreement that the top three priority bottlenecks were a shortage of teaching staff, not enough classroom space, and limited faculty accommodation on campus.

Table 3: Outcome of Stakeholder Voting to Prioritize Bottlenecks

Bottlenecks	**Individual Rank Scores** (1=lowest priority, 5=highest)									**Total Score**	**Group Ranking***
Shortage of teaching staff	4	5	5	4	4	5	4	5	5	41	1
Not enough administrative staff	-	-	-	-	1	-	-	-	-	1	7
Not enough classroom space	5	4	3	5	5	4	5	3	4	38	2
Poor Internet connectivity	-	1	-	2	2	-	2	-	3	10	5
Limited faculty accommodation on campus	3	2	4	3	3	1	-	4	-	20	3
Insufficient materials at skills labs	2	3	2	-	-	3	3	1	2	16	4
Out-of-date textbooks	1	-	1	1	-	2	-	2	1	8	6
No faculty or student exchange program	-	-	-	-	-	-	1	-	-	1	7

**Group ranking is based on the total of the individual rank scores. The bottleneck with the highest total score is ranked as first priority, the bottleneck with the second highest score is ranked second, and so forth.*

Defining Solutions for Addressing Priority Bottlenecks

The next stage in the process of defining best buys is to agree on possible solutions for overcoming priority bottlenecks. Before discussing potential solutions, the underlying causes of each priority bottleneck should first be explored and understood. If the root causes of a bottleneck are not considered, the solutions identified may not address the true source of the bottleneck and, therefore, will be ineffective or unsustainable. For example, a shortage of qualified teaching staff is a bottleneck for many academic programs, yet there are many possible underlying reasons for teacher shortages. In one context, the country or region might be experiencing a general shortage of teachers, whereas in another situation, teachers might not be interested in working at a school because of its geographic location, lack of accommodations for teachers, poor infrastructure, or inability to pay teachers a competitive salary. In the first situation, simply trying to recruit more teachers without increasing the pool of teachers in the country would have little long-term effect on overcoming the bottleneck, and in the second situation, addressing the underlying cause would require changing the living conditions and salary benefits at the school. Meaningful and effective solutions aim to address a bottleneck's underlying causes.

Therefore, three steps are needed to agree on solutions for overcoming priority bottlenecks:

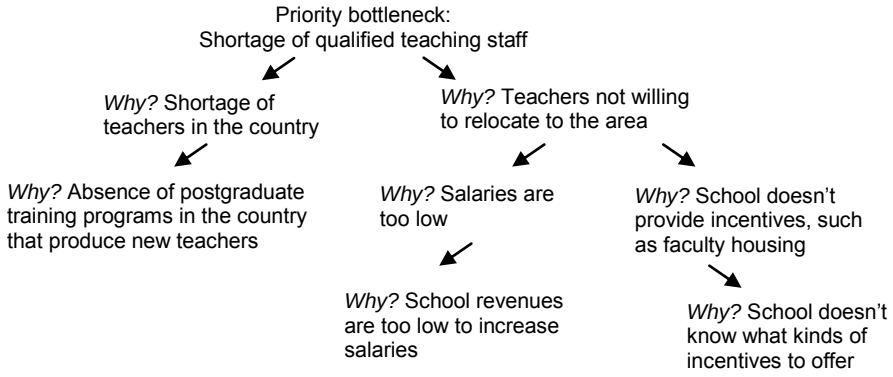
- List possible underlying causes of bottlenecks
- Identify solutions that address underlying causes and contribute to overcoming priority bottlenecks
- Agree on a list of feasible and effective solutions.

Listing underlying causes

To explore the underlying causes of a bottleneck requires asking the questions "Why?" or "Why is this bottleneck happening?" Doing this exercise with a group of stakeholders who hold different perspectives is ideal because it allows as many causes as possible to be considered at the same time. In most cases, the response to the question will be obvious to most stakeholders. For example, a question might be, "Why are the textbooks in the library out of date?" This question could quickly lead to the response, "Because the school cannot afford to buy new textbooks." As a short-term solution, the school could request that an interested charity, NGO, or government agency donate new textbooks. However, key stakeholders also should consider possible long-term solutions to this challenge, such as identifying and implementing new financing mechanisms for the school. (The Capacity*Plus* technical brief titled Innovative Financing Options for the Preservice Education of Health Professionals describes innovative approaches to funding [Tulenko and Preker 2013]).

Sometimes the root causes of a bottleneck are difficult to identify, or there are several interrelated causes. A "why, why" tree or fishbone diagram can help explore the possible causes of more complex bottlenecks (Okes 2009). The example in Figure 1 shows how a "why, why" tree was used to identify the two general reasons for school-level faculty shortages previously mentioned: 1) an overall shortage of teachers in the country; and 2) an unwillingness of teachers to relocate to the region where the school is located. Typically, the search for root causes should stop when the causes identified are beyond the control of the school or the response is "don't know."

Figure 1: Using a "Why, Why" Tree to Identify Possible Root Causes of Faculty Shortages



Identifying solutions

Table 4 shows how a group of key stakeholders moved from reviewing priority bottlenecks to identifying underlying causes and then defining potential solutions. In response to the first example (the bottleneck of teacher shortages), the group identified some interim solutions such as requesting that an international NGO sponsor qualified students to attend a graduate teacher training program in a nearby country. Although the logical long-term solution—creating a graduate training program within the country—was beyond the control of the school, the

stakeholders agreed to raise the issue with the Ministry of Education. Finally, to develop a better understanding of the package of salaries and other incentives needed to attract teachers to the school, the group agreed to request that the local health professional council assist them in conducting a rapid retention survey among teachers (Jaskiewicz et al. 2012).

Table 4: Examples of Priority Bottlenecks, Underlying Causes, and Possible Solutions

Step 1: Review priority bottleneck	Step 2: Why is this bottleneck happening? What are the underlying causes?	Step 3: Possible solutions? What can be done to overcome this bottleneck?
Example 1: Shortage of qualified teachers	• No graduate degree training program in the country to produce new faculty • Qualified faculty not willing to relocate to the area where the school is located	• Locate sponsors to support promising students to complete graduate studies in a nearby country • Encourage the Ministry of Education to create a graduate training program in the country • Identify salary and incentives package needed to attract and retain teachers, such as faculty housing or education grants for the children of faculty (e.g., conduct a rapid retention survey)
Example 2: Not enough classroom space to accommodate 100 additional students	• Lack of land on which to build additional classrooms • Lack of funds needed for construction	• Request permission from local authorities to use public land for a new building • Prepare a costed plan for the construction of a new classroom and submit it to possible funding sources (e.g., banks, charities, Ministry)
Example 3: Insufficient supplies of key instructional materials	• No departmental control over the funds used to purchase learning materials • Not enough funds to purchase new materials • Materials too expensive	• Request that a local charity or NGO donate materials • Ensure a yearly allocation of funds to the department for the purchase of materials • Raise additional funds for learning materials through innovative financing options (e.g., tiered tuition scheme, in-kind donations) • Purchase materials in bulk together with other schools, or share materials with a nearby school
Example 4: Limited student access to some clinical practice sites	• Public transportation expensive and unsafe for females traveling alone • No cover for school truck, precluding its use when raining	• Provide public transportation passes to students and ensure that female students travel in pairs • Purchase a cover for the school's truck
Example 5: Poor student supervision at clinical practice sites	• Clinic staff busy providing care to patients • Teaching not included in job descriptions/salaries of clinic staff • Lack of pedagogical training for clinical staff and discomfort teaching students	• Create formal agreements, such as memoranda of understanding, between the school and clinics • Pay clinical staff a small stipend to tutor students in the clinic • Provide teacher training to clinic staff who tutor students

Agreeing on solutions

Some solutions identified through the process of exploring root causes and possible solutions will be feasible, effective, and affordable. Others will not. Similarly, some solutions will be within the school's control, while some will not. The group should agree on a list of solutions that it believes are affordable, feasible to implement, and most likely to produce the desired effect. If a solution is beyond the control of a school, then key stakeholders should decide if it will be feasible to implement by, for example, meeting with local health or education authorities to request changes to policies, provision of resources, or other steps. In defining solutions, the group should review evidence-based recommendations for scaling up health professional education, such as those produced by the WHO (2010b, 2013) and the Commission on the Education of Health Professionals for the 21st Century (Frenk et al. 2010 and 2010b).

If the group has difficulty agreeing on solutions, the nominal group method (described in Box 2) can again be used to reach consensus on a manageable list of solutions. The group may also reach agreement on activities that don't require costing estimates, such as informing the national council or Ministry of Health or Education about a challenge identified through the assessment that cannot be adequately addressed by a single school.

Estimating the Cost of Solutions and Selecting Best Buys

After a list of solutions is defined, the next stage is to estimate the costs of the proposed solutions and agree on a final set of best buys. If two separate meetings are held—the first to agree on a manageable list of solutions and the second to agree on best buys—then a small group can take responsibility in between meetings for developing a cost estimate for each of the agreed-upon solutions. If the full process is completed in a single meeting, then a facilitator can divide the group into small working groups and request that each group spend a defined amount of time estimating the cost of one or more solutions. After producing rough cost estimates for their assigned solutions, each group can report their results back to the larger group.

The key stakeholders should review the full list of costed solutions. For each solution, they should consider the potential benefits of the solution relative to its cost. In addition, they should consider the potential negative consequences or impact of not implementing a solution, paying particular attention to the effect that nonimplementation would have on the school's ability to achieve its scale-up goals. After discussing these questions, the group should choose a relatively short list of actions to take forward as best buys. Best buys are the solutions or interventions that are most likely to achieve the scale-up goal for the least amount of investment. If needed, the nominal group method described in Box 2 can be used to help the group reach consensus on the final set of best buys.

The example in Table 5 shows a list of costed solutions and a final set of best buys. In this example, stakeholders considered a number of factors to arrive at the end result. The group achieved full consensus that the scale-up goal (admitting 100 additional students into the program) could not be achieved without additional teachers and classroom space. However, the group also agreed to ask the health professional council to assist the school in carrying out a

rapid retention survey to identify the salary/benefits package needed to attract and retain qualified teachers. In discussing the need for instructional materials, the group agreed that students could purchase their own materials. Because only a few students owned computers and the school had no computer lab, the group decided that Internet costs were not a good investment and were not critical to achieving the scale-up goal. The group agreed that renting faculty accommodations in a nearby village was more cost-effective than building additional faculty housing on campus. Finally, the group decided to postpone purchasing a cover for the school's truck because the chauffeur had recently retired and nobody was available to drive the truck.

As Table 5 demonstrates, there is no right or wrong set of best buys, and there is no single approach for defining them. The final set of best buys is a product of the collective judgment of the group of stakeholders involved in the process. Any number of contextual factors can influence the decisions they make. For example, the total cost of best buys might need to fit within a predefined amount of grant funds made available to the school. Alternatively, the group might decide to limit the selection of best buys to those that can be implemented within a specified time frame, for example, within one year. The final set of best buys should be achievable and affordable and demonstrate the highest potential for moving the school closer to achieving the scale-up goals defined for the targeted program.

Table 5: Sample List of Costed Solutions and Final Set of Best Buys

Scale-up goal: *Admit 100 additional students into the program*		
Priority bottleneck	**Solution**	**Estimated cost (USD)**
Shortage of qualified teachers	Employ five additional full-time educators	$2,570 per educator/ per year
Insufficient supplies of key instructional materials	Procure additional textbooks and classroom materials	$7,000
Not enough classroom space	Construct a classroom of 50x25 feet (foundation for additional floors)	$27,000
No access to research articles	Procure Internet access	$910 + $40/per month
Not enough housing on campus for all teaching staff	Upgrade faculty housing facilities (adding two bedrooms and a living area)	$21,000
Lack of student access to some clinical practice sites	Purchase a cover for the school truck	$2,500
Final set of best buys:* • Build one additional classroom ($27,000) • Hire five additional full-time educators ($12,850 for the first year)		

**This best buys package represents a one-time investment of $39,850. After one year, tuition revenue generated by the 100 additional students covers the recurrent cost of new teachers' salaries.*

Step Five: Sharing the Results and Planning Next Steps

The assessment team and school leaders should share the list of costed solutions with a broad range of stakeholders, especially those who can contribute resources or assistance to implementing the activities proposed, and develop a plan of action to help guide implementation.

The main activities in this step are to:

- Update and finalize the bottlenecks and best buys report
- Share the results with people and organizations that can help implement or finance the best buys
- Prepare an action plan.

Sharing the results

The assessment team should finalize the Bottlenecks and Best Buys report by adding the costed solutions and the final set of best buys that were agreed on by stakeholders. All documents collected during the situation analysis—such as organizational charts, lists of clinical practice sites, copies of policies and procedures, and other supporting documents—should be attached to the final report. Copies of the report can be distributed to:

- The school's leadership
- The senior administrators of the educational institution
- Relevant government authorities such as the local department of education and health, Ministry of Health, Ministry of Education, and Ministry of Finance
- Relevant local and international development organizations
- Other potential investors and technical agencies.

If possible, a meeting should be called with representatives of internal and external stakeholder groups, including representatives of foundations, agencies, organizations, and institutions that could provide technical or financial support to implement the best buys. The meeting should serve to present and discuss the results of the Bottlenecks and Best Buys Approach, including the solutions identified to overcome bottlenecks and their costs. At the meeting, stakeholders should also discuss next steps for the school, such as how to engage the school and others in implementing the interventions.

> ***Example*:** After completing a bottlenecks assessment at a rural health assistant training school in Ghana, the principal of the school held a meeting with the school's faculty, board of directors, and the regional Queen Mother to present the results of the assessment. During the meeting, the Queen Mother was requested to donate the additional land needed to construct a new classroom for the school, which was one of the best buys identified through the approach.

Planning next steps

An action plan is a list of the tasks needed to achieve a single objective. It begins with a clear purpose, vision, or goal—in this case a school's scale-up goal—and is designed to take the school from where it is now to the accomplishment of that goal.

A school focal person and key stakeholders should work together to develop an action plan for implementing the best buys. They should list all the activities needed in the order that they should be completed. Then, for each activity, they should assign a person or entity responsible for ensuring the activity is accomplished, indicate a time frame, estimate resource needs, and define the expected results. Table 6 provides an action plan template.

Table 6: Action Plan Template

Action plan for: [Insert name of school and academic program] Goal: [Insert the scale-up goal agreed on by stakeholders] Dates: [Insert time frame for implementing the plan]				
What action is planned?	By when?	Who is responsible?	What resources are needed (people, money, tools, etc.)?	What are the expected results?*
1.				
2.				
3.				
Etc.				

**Expected results are the measurable outputs from a planned activity. For example, at least 12 teachers are trained, 40 students have access to clinical demonstration materials, or new clinical training sites are available for ten additional students.*

If several schools are involved in the approach, they may choose to develop a joint action plan. This allows for collaborative planning and implementation as well as economies of scale for a number of activities, such as the training of teaching faculty or procurement of learning materials.

***Example*:** In the Democratic Republic of the Congo, partners in the PEPFAR-funded Nursing Education Partnership Initiative (NEPI) collaborated with the national NEPI steering committee, which included representatives of the ministries of health and education, to carry out a bottlenecks assessment at seven nursing and midwifery training institutions. Based on the results of the assessments, the national steering committee and US partners worked with four institutes to develop costed action plans for overcoming the bottlenecks identified. Each plan was targeted to the particular needs of a school. However, several activities—such as faculty training, curricula updating, and the procurement of learning materials—were common across more than one school. Collaboration at the national level provided an opportunity for combined implementation of selected activities, allowing schools to network, share knowledge and experiences, and benefit from economies of scale when revising curricula and procuring learning materials and equipment.

One person at the school should take responsibility for monitoring the progress of the overall action plan and working with those responsible for activities to solve problems and overcome

challenges. In addition to ensuring that activities are implemented, this person should verify that the set of activities is contributing to the achievement of the expected goal. In some cases, incorrect assumptions might have been made about the actions needed to overcome bottlenecks. The implementation of best buys may also create new bottlenecks in the education system that were not initially observed or anticipated. As activities unfold, the school focal person and key stakeholders should update or revise the action plan as needed. Revisions might include, for example, adding or removing activities, updating time frames, mobilizing additional resources, or assigning a new person to be responsible for an activity. Finally, the school leadership might choose to conduct a second situation analysis and bottlenecks assessment to measure overall progress toward goals and/or identify new bottlenecks.

School leaders and other stakeholders are encouraged to share and discuss their experiences in implementing the Bottlenecks and Best Buys Approach through the WHO's interactive website on transformative education, located at http://whoeducationguidelines.org.

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