Organisation des Nations Unies pour l'éducation, la science et la culture

Institut international de planification de l'éducation

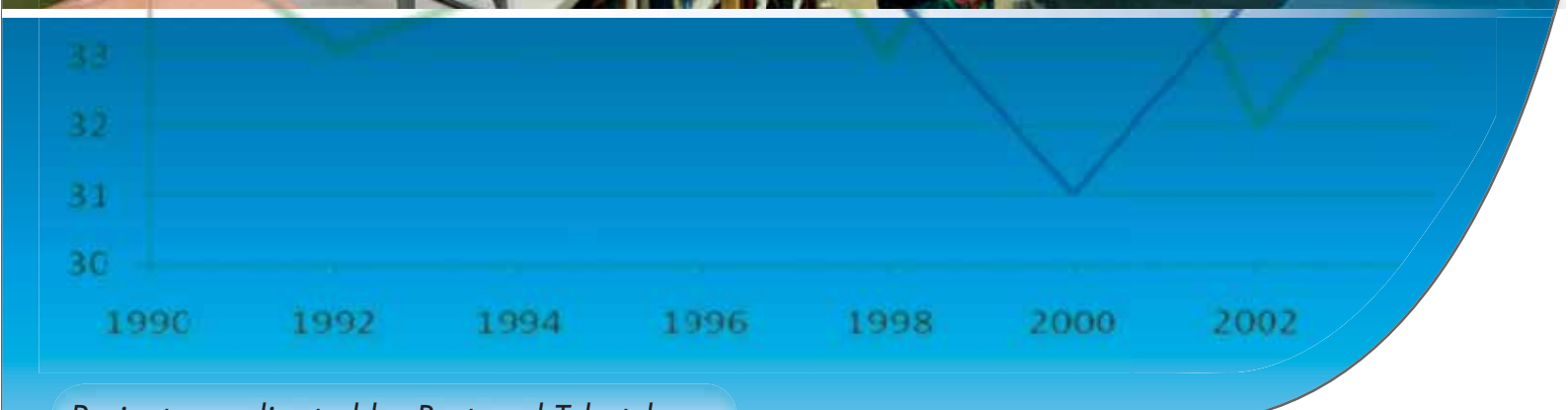
United Nations Educational, Scientific and Cultural Organization

UNESCO INSTITUTE for STATISTICS

Constructing an indicator system or scorecard for higher education

A practical guide

Michaela Martin
Claude Sauvageot



Project coordinated by Bertrand Tchatchoua

Higher Education

Constructing an indicator system or scorecard for higher education

A practical guide

Michaela Martin

Claude Sauvageot

Project coordinated by
Bertrand Tchatchoua

United Nations
Educational, Scientific and
Cultural Organization

International Institute
for Educational Planning

United Nations
Educational, Scientific and
Cultural Organization

UNESCO
INSTITUTE
for
STATISTICS

The publication costs of this study have been covered through a grant-in-aid offered by UNESCO and by voluntary contributions made by several Member States of UNESCO, the list of which will be found at the end of the volume.

Published by:
International Institute for Educational Planning
7–9 rue Eugène Delacroix, 75116 Paris, France
info@iiep.unesco.org
www.iiep.unesco.org

Typesetting: Linéale Production
Printed in IIEP's printshop
ISBN: 978-92-803-1329-1

Contents

List of abbreviations

AES	administration, economics, and social sciences
BSC	balanced scorecard
CEPES	European Centre for Higher Education (UNESCO)
CEREQ	Centre for Studies and Research on Qualifications (France) (*Centre d'études et de recherches sur les qualifications*)
CFA franc	currency used in 14 countries of West and Central Africa (*franc de la Communauté financière africaine*)
CHE	Centre for Higher Education (Germany)
CNAM	National Centre for Arts and Crafts (France) (*Centre national des arts et métiers*)
COMEDAF	Conference of Ministers of Education of the African Union
CPGE	post-secondary classes to prepare for the competitive exams to gain admission to prestigious higher education institutions (France) (*classes préparatoires aux grandes écoles*)
CWTS	Centre for Science and Technology Studies, Leiden University (Netherlands)
DEPP	Evaluation, Forecasting, and Performance Directorate, Ministry of Education (France) (*Direction de l'évaluation, de la prospective et de la performance, ministère de l'Éducation nationale*)
DUT	university diploma in technology (France) (*diplôme universitaire de technologie*)
EHEA	European Higher Education Area
EU	European Union
Eurostat	Statistical Office of the European Union
Eurydice	Network on education systems and policies in Europe
FTE	full-time equivalent
GDP	gross domestic product
GER	gross enrolment ratio
GUNI	Global University Network for Innovation
HEFCE	Higher Education Funding Council for England (UK)
HESA	Higher Education Statistics Agency (UK)
ICT	information and communication technology
IHEP	Institute for Higher Education Policy (USA)
IPR	intellectual property rights
IIEP	International Institute for Educational Planning (UNESCO)
INES	International Indicators of Education Systems project (OECD)
IREG	International Ranking Expert Group
ISCED	International Standard Classification of Education
IMAP	Internet Message Access Protocol
IUT	university institute of technology (France) (*institut universitaire de technologie*)
KPI	key performance indicators

LOLF	law relating to powers and procedures in public finances (France) (*Loi organique relative aux lois de finances*)
MEN	Ministry of Education (France) (*Ministère de l'Éducation nationale*)
MST	mathematics, sciences, and technology
MESR	Ministry of Higher Education and Research (France) (*Ministère de l'Enseignement supérieur et de la Recherche*)
NPHE	National Plan for Higher Education (South Africa)
ODL	open and distance learning
OECD	Organisation for Economic Co-operation and Development
OT	overseas territory (France) (*département d'outre-mer*)
PISA	Programme for International Student Assessment (OECD)
PhD	Doctor of Philosophy
QS	Quacquarelli Symonds
RAE	Research Assessment Exercise (UK)
SCIE	Science Citation Index Expanded
SSCI	Social Science Citation Index
STAPS	sciences and techniques of physical activity and sports (France) (*sciences et techniques des activités physiques et sportives*)
STS	post-secondary professional/technical studies (France) (*section de techniciens supérieurs*)
TEC	Tertiary Education Commission (Mauritius)
THES	*Times Higher Education Supplement*
UG	undergraduate
UIS	UNESCO Institute for Statistics
UIS/SCB	Statistical Capacity Building section of the UNESCO Institute for Statistics
UK	United Kingdom
UNESCO	United Nations Educational, Scientific and Cultural Organization
UTM	Universiti Teknologi Malaysia

List of tables and figures

Tables

Figures

Preface

At the beginning of this new millennium, the importance of higher education for a country's development needs no further proof. Higher education instils skills and teaches advanced knowledge that are vital for building a knowledge society. It is both the final link in the education chain and a source of new knowledge and training that supports the other levels of the education system.

Higher education around the world faces enormous challenges. The demand for this level of education is very strong. The expansion of education systems requires a rapid transformation in institutions, the supply of education, and teaching practices. To meet the challenge of this demand, higher education systems are undergoing a process of diversification and modernization.

In this context, the forms of education governance are also in a period of transformation. In particular, in exchange for granting greater autonomy to higher education institutions, governments are asking them to develop their own institutional policies and strategic plans, and to be in a position to demonstrate clearly the results of these. In order to respond to this new demand, institutions are obliged to build their own management capacity and implement better-performing information systems and monitoring tools. For this reason, an indicator system (also known as a 'scorecard or 'dashboard') for higher education seems to be an indispensable management and communication tool.

This guide flows from this concept. It fulfils a need identified by work conducted by the UNESCO Institute for Statistics (UIS) and the International Institute for Educational Planning (IIEP) in concert with statistics specialists and educational planners. Many countries are currently exploring the best means of designing indicator systems for their higher education sectors. They perceive the need for an indicator system to improve communication on the progress of their higher education systems to the public at large and funding organizations, as well as to monitor the implementation of their public higher education policies.

Therefore, this work has a very concrete goal. As its title indicates, the major goal is to provide a practical guide for educational planners who wish to construct an indicator system. To this end, it presents general guidelines and tools for developing and presenting indicators. It begins by discussing the context in which the need for an indicator system may arise. It then presents the various goals of an indicator system, which influence its orientation and format, and outlines a methodology for setting up such a system. Finally, it covers the very important question of rankings in higher education. These can be seen as the recent product of increased competition among institutions and countries to attract the best professors and students. Ranking can either serve as a source of indicators for an indicator system or provide a means of comparison to explain certain aspects of the system in relation to regional and international realities.

The contents of this guide were nurtured in discussions conducted with educational planners in ministries of higher education in francophone Africa during the Workshop on Identifying Information Needs in the Higher Education Sector organized by the Statistical Capacity Building Unit of the UNESCO Institute for Statistics (UIS/SCB), held in Dakar, 28–30 April 2008.

We hope that this publication will help higher education planners and policy-makers to construct indicator systems that contain both useful and relevant indicators and that these systems will be regularly updated.

We also hope that indicator systems will contribute to better management of higher education systems in order to improve their functioning and the quality of teaching and research conducted therein.

Hendrik van der Pol
Director, UIS

Mark Bray
Director, IIEP*

* From 2006 to 2010.

Acknowledgements

The project to produce this guide was initiated by the UNESCO Institute for Statistics (UIS), which benefited from the technical expertise of the International Institute for Educational Planning (IIEP).

Bertrand Tchatchoua, Programme Specialist at UIS, provided technical assistance in the production of this document. In addition, he worked in close collaboration with the authors. During the various phases of writing and editing, he provided invaluable observations and comments.

Many staff members at IIEP and UIS also provided comments on the final version of this guide, notably Patricia Dias da Graça, Khadim Sylla, N.V. Varghese, Nafiou Inoussa, and Saïd Belkachla.

Hendrik van der Pol, Director of UIS, and Mark Bray, former Director of IIEP, supported the project throughout its execution.

We sincerely thank all of these people for their significant contributions towards the production of this guide.

Michaela Martin and Claude Sauvageot

Introduction

Indicators in general, and indicator systems in particular, are on the agenda in all sectors and all levels of education systems. Current interest in these tools is based on trends related to reform of the public sector in general and higher education systems in particular, but also on those related to reforms in the governance and management of higher education institutions.

In the 1980s, much work was conducted on indicator systems. Following a period of development, notably in the countries of the Organisation for Economic Co-operation and Development (OECD), many countries now possess a set of indicators, commonly called a 'scorecard' or 'dashboard'. It provides a means of assessing to what degree an education system or its institutions are progressing with respect to their predefined goals. Countries in the South acknowledge the utility of such tools but still face great challenges in implementing them.

Indicator systems have emerged in the context of increased awareness of the importance of analysing performance. On the one hand, the importance of data to inform rational decision-making needs no further proof, and in the context of policies designed to give more autonomy to institutions, verifying the performance of these institutions has become an obligation. On the other, governments face an increasing need to inform stakeholders – most often the elected body (parliament), but on occasion a wider audience – on the state of higher education. International comparisons for the purpose of benchmarking the system are perceived as a priority in this context. Furthermore, indicators are on the agenda in terms of new funding modalities in international cooperation that make funding conditional upon a country having an education plan and a system of indicators that can measure progress. The moment is therefore propitious for helping planners, at both the national and institutional levels, to construct an indicator system that matches their current policy or plan in progress.

However, caution is required from the outset. A higher education indicator system cannot be developed without two prerequisites being fulfilled. The first is possession of a functioning information system that contains basic information reliable enough to develop the indicators. This is not always the case. Indeed, many countries in the South have dysfunctional information systems that are not very accurate and are unable to produce information in the time required. Therefore, an indicator system is not the first step but rather the end result of a functioning information system that can make good use of data and communicate them clearly. The second prerequisite is a policy or plan that is sufficiently explicit and clear, providing a foundation upon which an informative indicator system can be constructed. These two crucial prerequisites will be discussed in detail throughout this document.

The goal of this 'practical guide' is to support higher education planners in building an indicator system that is both well adapted to the context of their countries and sufficiently explicit to serve as an instrument for monitoring national higher education policy or simply the functioning of the system.

Chapter 1

The context of higher education policies

Higher education is at a crossroads today in the majority of developed and developing countries. Following a period of strong political and financial support at independence, owing to its prestige as a national symbol, higher education has been in crisis in many developing countries since the 1980s. The consequence has been lower levels of funding and lack of political support for its development. In the wake of the recent emergence of the concept of the 'knowledge economy', which is considered a major factor of national and international competitiveness, higher education is now reassuming its strategic role in national development. This new perspective has translated into increased political will to manage higher education so that it coincides with development goals.

1.1 Significant trends in the evolution of higher education systems around the world

The development of higher education is characterized by certain strong trends, including the following five:

- *Rapid worldwide increase in the student population*
  The world student population increased from 68 million in 1991 to 151 million in 2007, an unprecedented growth surge. In some regions, the increase has been extremely rapid. In the East Asia-Pacific region, for example, the number of students rose from 14 to 46 million. This means the gross enrolment rate (GER) increased from 14% in 1991 to 26% in 2007 (UIS, 2009).
  However, this expansion has been marked by inequality between regions. In North America and Western Europe, the GER rose from 52% in 1991 to 70% in 2007, while in sub-Saharan Africa, it increased only from 3% to 6% during the same period.
  In many countries, the growth of the student population has presented institutions with challenges in managing the influx. Very often, funding has not matched the level of growth, which in turn has affected the quality of higher education.
- *Diversification in the provision of education*
  Given the pressure of student influx and real or anticipated changes in employment structures, higher education models have become widely diversified, either from the institutional point of view in terms of the creation of new types of institutions offering short-term training (more professionally oriented), or simply by offering courses with content more applicable to the job market. The increasing tendency to speak of 'tertiary education' is revealing in that there are now many institutions and educational opportunities that are not necessarily connected with a university.
- *Increased privatization of higher education*
  Some countries, notably in Latin America and Asia, have a well-established tradition of private higher education, while in other countries this type of institution is primarily a novelty. To respond to increased social demand and cope with funding constraints, a number of countries that did not have this tradition have recently given legal status to private institutions, which are showing remarkable dynamism by developing more quickly than public sector institutions.
  Privatization is also on the agenda in the public sector, which, often confronted with funding constraints, has had to develop its capacity to generate its own resources by offering its education and research services to the private sector at a price. The emergence and rapid development of the private sector presents new problems related to supervision and quality control.
- *Growing internationalization*
  Although it is commonly acknowledged that higher education is an international activity *par excellence*, in recent years international mobility has been developing at every level. Student mobility is one of the more visible signs of this growing interest in things international. The number of students studying abroad rose from 750,000 in 1974 to nearly 2.8 million in 2007 (UIS, 2009). Africa is the continent with the greatest mobility – nearly 6% of the student population in 2007 (UIS, 2009). The internationalization of higher education has been accompanied by an increased perception of the importance of the funding issues, both individual and collective, that underlie this mobility. In the

past, financing an education primarily depended on the availability of scholarships. Today, however, students must increasingly rely on their own financial resources. In this context, countries often engage in active policies to attract foreign students. Therefore, there now exists a market for higher education, and as a result, there is increased interest in comparing the performance of countries' education systems.

- *Regional integration and the internationalization of policies*
  It should also be noted that higher education is being increasingly affected by the movement towards regional integration, since the latter exists in some form or another around the world. In many regions, the creation of internal markets with the goal of the free circulation of people directly affects the educational sphere because it requires the recognition of diplomas and degrees. In the European region, the aim of the Bologna Process is to create a European Higher Education Area (EHEA) with a common structure of qualifications. The development of a regional qualifications framework is under way in the Southern African Development Community, as well as in the Pacific and Caribbean regions. The African Union has proclaimed a policy objective of harmonizing the qualification structure throughout the African continent by adopting the bachelor's-master's-doctorate structure. These examples illustrate how the process of regional integration can affect education policies and planning objectives.

1.2 Trends in the reform of governance and management

The trends described above are driving a re-examination of the traditional methods of governance of education systems and institutional management. Many countries around the world have recently introduced reforms to their systems of governance that directly affect the management of their educational institutions. The most significant trends that influence the need for information and consequently the demand for indicator systems include the following:

- *Deregulation*
  In many countries, administrations have been re-organized according to the 'new public management' model, which redefines their role as public authorities. With regard to education policy, one of the emerging characteristics of this model is the greater trust placed in deregulation and decentralization from public authorities to institutions by granting more institutional autonomy, in particular in the administrative area. New management tools have appeared, such as goal negotiation and performance contracts related to institutional policies and plans. The application of funding formulas aimed at distributing the education budget among the various institutions of higher education, allocating them lump-sum grants based on performance indicators, is part of this new trend in reforming higher education management.
- *Differentiation of institutions' missions*
  Faced with the expansion of higher education, higher education institutions have been engaged in a process of informal differentiation of their priority missions in recent years. In systems experiencing a high level of expansion, institutions are seeking to develop, at least in part, individual profiles based on the characteristics of their socio-economic environments, the better to fulfil the needs of their stakeholders. Matching teaching and research to the needs of the region is seen as particularly important. The target population of the institution is also seen as part of this differentiation (a type of 'branding'). In addition, as institutions often face funding constraints, some of them develop entrepreneurial activities to offer their teaching, training, and research to the business world.
- *Importance of strategic planning*
  As a direct consequence of increased autonomy on the part of institutions, strategic planning in higher education has emerged in the past two decades. Such plans have been developed either at the request of governments, to inform discussions related to performance contracts, or on the initiative of institutions themselves if they are in a context where the market plays an important role. The introduction of strategic planning generates new needs for monitoring by

institutions and fosters the development of both information systems and indicator systems as part of this process.

- *Increased importance of monitoring performance*
  The increased autonomy of institutions is reflected in new monitoring tools, such as external quality assurance models and indicator systems. In terms of quality assurance, audits, evaluations, and accreditation of programmes are among the most common reform measures and form a veritable worldwide trend. External quality control provides a means of monitoring quality without necessarily generating performance comparisons. The goal of indicator systems, already widespread in the English-speaking world, is to follow up on national or provincial education policy and have a database that provides a means of comparison among entities such as institutions, departments, and individuals. These tools are related to the notions of self-regulation and autonomy, and reflect the idea of 'remote steering', which puts the indicator system at the centre of the approach to monitoring. Given the differentiation of institutions and the need to generate data on their performance, a current issue is the need to evaluate groups of institutions that may be comparable in terms of their mission.
- *Greater role of the market*
  New forms of management in higher education at the country or provincial level have often gone hand in hand with greater trust in market mechanisms. Certain countries have a strong market tradition, while others have embraced such mechanisms in more recent years. In general, increasingly diverse 'consumers' of higher education are asking for precise information on the functioning and performance of institutions. In very diverse market-driven higher education systems, informing consumers and the general public through rankings and accreditation mechanisms has been a long-standing practice. Today, however, demand for information on performance on the part of families and students is also emerging in other countries that are increasingly influenced by market forces. Increased competition among institutions to attract students and research funding is a natural consequence.
- *Emergence of ranking*
  In response to the demand from families and private enterprise, institutions are increasingly being ranked. Rankings of higher education institutions are produced not only by the media but also, and increasingly, by parastatal organizations. More recently, international rankings are being seen in addition to country rankings. For example, the Shanghai Ranking produces a list of the 500 best research universities in the world. Rankings are very controversial, but they have had a substantial impact on the debate surrounding the strengths and weaknesses of universities in an increasingly competitive global market.

Exercise 1

1) What recent developments are affecting your higher education system? Which of the trends indicated in the text can be observed in your country?

2) In what way are these recent developments affecting the need to establish or improve a system of indicators?

CHAPTER 2

DEFINITIONS AND WAYS OF CONSTRUCTING AN INDICATOR SYSTEM

This chapter presents an overview of indicator systems and scorecards. It will familiarize readers with the 'indicators and scorecard' process, which can be applied to institutions and sectors in various fields such as health care and to all levels of education. The following chapters cover the entire process and apply it to higher education and institutional management.

2.1 Objectives of an indicator system

For most countries, the appearance of indicators and indicator systems in higher education constitutes a response to two policy objectives: exercising more rigorous monitoring in this field and, in times of fiscal restraint, establishing a more direct and observable link between funding and performance. The goal of using a system of indicators is to make the autonomy and diversification of higher education institutions compatible with accountability and effective management of these institutions. Indicators thus provide a means of not only external monitoring of these institutions by governments, but also internal monitoring of overall institutional goals or specific ones set by departments or service units.

Using an indicator system can provide a clear and coherent definition of government goals and policies in matters of higher education as well as those of the administrators of these institutions. In general, an indicator system provides a means of assessing progress towards the objectives of an educational programme. It can also shed light on the detailed nature of the desired results. Indicators chosen for a scorecard can therefore be the medium through which politicians, decision-makers, and administrators can precisely define the results they expect from their strategies and plans. The definition of these indicators could lead to a useful dialogue among stakeholders, allowing them to discuss the expected results from a higher education policy or plan.

As previously indicated, changes in higher education systems and institutions are profound and accelerating. On a consistent and regular basis, indicators can provide data on the ways in which policies have affected a particular education system or institution, in other words, on changes in specific variables under the control of those who designed or implemented the policies.

2.2 Indicators and administrative cultures

Indicator systems can play just as important a role in centralized higher education systems (with less autonomy for institutions and students) as they can in more market-driven and decentralized systems (with more autonomy for institutions and choices for students). As previously mentioned, recent trends show that education systems are being directed towards increasingly decentralized models.

In countries with centralized education systems, the essential goal of an indicator system is to provide a means of measuring performance and controlling the quality of services that institutions are providing. In these centralized systems, traditionally those of Continental Europe but also those of many developing countries, consumer demand is not determined at the time resources are allocated to institutions. Emphasis is placed more on bureaucratic regulation and quality control, wherein indicators play a key role.

In market-driven systems, like those in a number of English-speaking countries, the publication of indicators that facilitate comparisons among institutions and systems is designed to keep 'consumers' of higher education and other stakeholders well informed. An indicator system allows for the creation of market transparency, making informed choices and improving the efficiency of resource allocation.

2.3 Various uses of indicator systems

In practice, indicator systems can have a variety of purposes in higher education, which in turn affect the structure, scope, and nature of the information contained in them.

We can distinguish three specific uses of indicator systems:

- informing the general public or government on the status of the system;

- monitoring the progress of a policy, strategy, or plan that has been implemented (or one of its components);
- managing the higher education system or an institution as a whole.

Indicator systems for public information

This type of indicator system generally contains information on trends in the student population (broken down by programme, year of study or level, sex, institution and/or new admissions), on degrees, diplomas or certificates, on human resources (researchers and professors, broken down by discipline, year of study or level, post, age, teaching, technical or administrative personnel, etc.), funding resources, and sometimes even on research assets and performance in scientific research.

For a number of years France has published a document entitled *The State of Higher Education and Research in France*, which discusses these themes in the light of 29 indicators related to costs (3 indicators), staff (3 indicators), activities (8 indicators), results (6 indicators), and research (9 indicators) (see *Appendix 3*). This document is made available before the Education Committee session of the National Assembly to provide parliamentarians with basic information, before being distributed in the form of a publication.

The distinguishing feature of indicator systems designed to inform the general public is the illustration of data in figures (tables and graphs) to increase readability, along with commentary to facilitate comprehension.

Indicator systems for policy monitoring

As indicated above, indicator systems can be designed specifically to monitor the implementation of a policy or plan in higher education. Countries with a long tradition of decentralization in higher education, such as certain English-speaking ones, also have considerable experience in using a system of indicators.

In England, for example, the government has been addressing the problem of the lack of systematic application of indicators in higher education since the 1980s. Internal pressure on the part of the government and certain institutional administrators, as well as international pressure, have resulted in the publication of a series of reports designed to regulate the use of indicators in this field.

In 1985, the Jarratt Report revealed the absence of precise goals in the British higher education system and in institutions themselves, which has led to the systematic application of indicators in this field. The report also listed indicators used until that time and then demanded more complete information from universities (Cave, Hanney, and Kogan, 1997).

That same year, based on the Jarratt Report, the British government stated that the application of these indicators was key in overseeing the effective use of funds invested in higher education. Their implementation would provide a means for the government to ascertain the degree to which public funds allocated to higher education could be concretely evaluated, and to compare, in terms of efficacy and efficiency, the various parts of the system and analyse its progress over time.

In a study on performance indicators in higher education (1999), the Higher Education Funding Council for England (HEFCE) states their five purposes: 'to provide better and more reliable information on the performance of the sector; to allow comparison between individual institutions; to enable institutions to benchmark their own performance; to inform policy developments; and to contribute to the public accountability of higher education'.

Subsequently, the government directed its efforts towards improving the quality of educational institutions, developing educational criteria, and spurring more efficient use of resources. To accomplish this, it demanded that organizations mandated to fund higher education institutions work together with representatives of these institutions to design and propose a set of indicators to assess teaching and research in the British system.

In January 2003, the government published a White Paper entitled *The Future of Higher Education*. The strategic goals outlined therein can be summarized as follows:

- research excellence: building on strengths;
- higher education and business: exchanging and developing knowledge and skills;
- teaching and learning: delivering excellence;
- expanding higher education to meet needs;
- providing fair access;
- developing funding capacity and transparency.

To monitor the policy goal of research excellence, higher education funding councils have been using data based on the Research Assessment Exercise (RAE). Conducted every four or five years, the RAE assigns a grade between A and E to each university department, based on both the quantity and the quality of research it produces. In addition, each year universities must provide information on the publications of their research staff.

To monitor progress towards the goal of excellence in higher education teaching, the non-completion (dropout) rate is used, as well as the employment rate six months following the attainment of a university degree.

To monitor progress towards the goal of inclusion, universities must report on student populations of disadvantaged groups, such as the percentages of new entrants who attended a school or college in the state sector, whose parents have certain occupations ('skilled manual', 'semi-skilled', or 'unskilled'), and who are from neighbourhoods (as denoted by postcode) that are known to have a low proportion of 18- and 19-year-olds in higher education.

Since 2002/2003, the Higher Education Statistics Agency (HESA) has published the performance indicators on behalf of HEFCE, which published them previously. Selected performance indicators are designed to provide information on the performance of the higher education sector in the UK in relation to declared policy goals for the sector. They are also expected to contribute to greater public accountability (see www.hesa.ac.uk/).

In addition to government monitoring of education policies, which commonly results in the publication of official performance indicators, other types of monitoring are conducted to produce information for 'consumers', increase competition between institutions, and raise the quality of education. These involve guides for students and, above all, rankings of universities and colleges.

These two types of indicator systems (informing the public and monitoring policy) are similar enough to be covered together in *Chapter 4*. Indeed, indicator systems destined for the public and for the government essentially provide a means of monitoring policies or plans, even if they do not contain as much detail as indicator systems designed for management purposes.

Indicator systems for management

An indicator system for management purposes is mainly designed for public authorities (ministries, buffer organizations) rather than for the general public. Its goal is to contribute to strategic planning and to provide background for macro-level decision-making. It often contains more information than indicator systems designed to inform the public, including raw data, and can be quite a large document. It provides statistics on trends related to student populations, higher education institutions, human and financial resources, and infrastructure. It commonly includes various analyses used by public authorities to monitor the education system as a whole. It therefore frequently covers issues of enrolment, coverage, internal and external efficiency, and quality.

For example, the Tunisian indicator system presented in *Table 4.5* (p. 40) presents a comprehensive list of 48 indicators and contains a large quantity of information on higher education for the general public. Of note is that the emphasis is on certain national policy concerns, namely the effort to tailor higher education to the needs of the labour market and develop its capacities for research.

Exercise 2

What type of indicator system do you think would be most appropriate for your country?

2.4 Prerequisites for developing an indicator system

An operational information system

Without a good information system, it is impossible to build a set of relevant indicators and in turn an indicator system based on them.

Most countries have set up an information system for all levels of education, and in particular for higher education. The ever-increasing importance and complexity of higher education have resulted in a need for clear explanation of the arguments and justifications for strategies and activities conducted in this sector. This imperative has been amplified in an environment calling for more efficient use of increasingly scarce resources. Hence the strong need to build or strengthen information systems in such a manner that they

become a main component of the planning or decision-making process.

An information system is costly. Very often it consists in producing statistical yearbooks to which most stakeholders in higher education – policy-makers, administrators, professors, students, parents, pupils – do not have access. This is why the quality and quantity of information are low. Information that is little or never used has a much greater chance of losing its reliability and utility in terms of the need to have it within a certain time frame or being able to validate it. There is even a danger that the production of certain data may cease if these data are never used or cannot be used when needed. For example, data on students' ages are no longer available in certain countries that previously collected them. Age data are an important source of information on the student population in higher education institutions and provide a means of calculating enrolment rates by age. The result of not producing data as straightforward as age data is that a very important indicator cannot be calculated. Moreover, if they are to be of use, data must be up to date. This points to another serious constraint: timely availability of recent data, covering the current academic year or, at worst, the previous year.

For many countries, producing recent data does not seem to be a priority. Yet it is impossible to ask policy-makers to base their decisions on outdated data. Government ministers need indicators on the impact of policy directions and activities. Students want data to help them decide the future of their studies. How, in this context, can we obtain essential data for the current academic year which are sufficiently detailed to measure the impact of a recently implemented policy?

To improve the availability of data, an increasing number of countries are collecting information by means of rapid surveys of a sample of higher education institutions. Such tools can be particularly useful in one or another of the following situations:

- To lighten the burden on higher education institutions as a group, certain data that do not require exhaustive investigation will be collected only from a limited number of institutions.
- To obtain rapid feedback on, for example, the implementation of a new policy or the general characteristics of a student population, a sample of higher education institutions can provide the required data.

With regard to the second point above, it is unnecessary to wait until the end of the registration period to have a first impression of the nature of student populations. Registration for certain programmes or courses can occur over a period of a few months, and it can be useful to have data indicating a trend before the registration deadlines have passed. Preliminary data can be useful in managing a system in the short term, although this is predicated on having a clear understanding and a good explanation of the concept of 'preliminary data'. This concept is not always easy to convey, but it enables statisticians to provide very useful information to policy-makers and administrators. Moreover, if sample surveys are repeated regularly, it is possible to study any differences or gaps between preliminary data and those from more detailed surveys, and thus to 'pre-estimate' in-depth data very early in the academic year.

In this regard, it should be repeated that an indicator system – that is, a set of indicators – and a statistical yearbook have different purposes. The former is intended to provide a portrait of the progress of an education system over time, highlighting certain trends and revealing any problems. The latter is intended to gather all the data on education and present them in a single publication. Whereas the yearbook is exhaustive, the indicator system is more focused and succinct.

Using indicators for analysis can help to improve information systems, in terms of both the volume and the reliability of the information generated. The publication of a indicator system constitutes feedback for people who produce information, such as those responsible for statistics in a higher education institution. Indicators can also demonstrate to what degree the data being collected are important, useful, and actually being used, which can give statisticians and administrators greater motivation to provide precise information, fill out the questionnaires correctly, and present accurate and reliable data.

The reliability of data is currently a common topic of debate. To be sure, it is often difficult to ascertain the precision of one or another datum on a student population. However, there is no question of waiting for hypothetically accurate

data to 'fall from the sky'. On the contrary, it is by publishing and using data, with the necessary precautions, that we can improve their quality. This is the virtuous circle of statisticians. Furthermore, certain problems are so obvious that they do not require a level of precision closer than a few percentage points.

A series of diagnostic surveys[1] conducted by UIS from 2003 to 2005 has provided data on higher education information systems in a number of countries, including Ethiopia, Guinea, Mauritania, Niger, and Uganda. In all five of these countries, the production chain of higher education statistics was embryonic and poorly structured, from the perspective of data collection instruments, data processing, production of analytical reports, and distribution and use of the data. As a result, little relevant information can be used, and a set of indicators is not yet a viable option. Therefore, considerable methodological and organizational work must be conducted before indicator systems can be developed.

If data collection issues have been resolved, then the data collected can be transformed into a set of indicators, which constitute an indicator system. We will return to this below.

An education policy and/or plan

Although an education policy or plan is not as vital as an information system, it can greatly facilitate the choice of the indicators that will constitute the indicator system. Similarly, at an institutional level, having a strategy or plan can facilitate the construction of the institution's indicator system.

The reason is that, in addition to presenting a clear, basic, and relevant description, a set of indicators should measure events and the progress of various activities that are of interest to stakeholders in the higher education system or to administrators of educational institutions. Clear and measurable objectives should be defined for the system or institution. These can take a variety of forms: a plan, government policy guidelines, measures that are clearly indicated in the law or certain regulations, an institutional plan passed by a board of directors, and so forth.

The task therefore consists of developing the most appropriate indicators and indicator system so as to monitor the policy objectives that have been chosen.

Three types of situations can be distinguished:

- An **objective is defined quantitatively** and the indicators serve to define the objective. An example: 50% of an age group should obtain a higher education degree or diploma. (This is obviously the most basic example.)
- An **education policy declaration** has been approved by the authorities, such as a legislative or planning body. The declaration outlines objectives, but they are not quantitative and do not refer to precise indicators. The task therefore consists in clearly explaining which indicators can be used to assess these policy objectives. This requires considerable methodological work that should be validated by those responsible for the policy. (This situation is more difficult and requires time.)
- There is **no education policy declaration**. Therefore, reference must be made to what is done in similar countries and, here again, has been validated by those responsible for education policy. This is the most difficult and most sensitive situation, for which constructing a set of indicators or an 'official' indicator system takes the most time. (We may occasionally suspect that vagueness or lack of clarity is in itself a politically motivated choice. Transparency is not always desired.)

Two very different examples of goals and objectives are presented below. *Example 1* refers to the World Declaration on Higher Education, developed by UNESCO, which defines major goals for higher education in general. *Example 2* is an excerpt from the 1997 South African White Paper *A Programme for the Transformation of Higher Education*, which laid the foundation for the development of the post-apartheid South African higher education sector. The excerpt contains the vision statement as well as a presentation of goals at the national level.

1. Diagnostic reports of the UNESCO Institute for Statistics (UIS) on 12 countries, 7 of which were African.

Example 1: UNESCO – World Declaration on Higher Education for the Twenty-First Century (1998)

In 1998, UNESCO issued its World Declaration on Higher Education for the Twenty-First Century. Many large-scale goals were defined in terms of this vision of higher education for the twenty-first century:

- ensuring equal access to higher education;
- enhancing the participation and promoting the role of women;
- advancing knowledge through research in the sciences, arts, and humanities and through dissemination of results;
- developing a long-term orientation based on relevance;
- strengthening cooperation with the world of work and analysing and anticipating societal needs;
- diversifying for enhanced equality of opportunity;
- innovative educational approaches: critical thinking and creativity.

Example 2: South Africa – Government White Paper: *A Programme for the Transformation of Higher Education* (1997)

VISION

1.14 The Ministry's vision is of a transformed, democratic, non-racial, and non-sexist system of higher education that will:

- promote equity of access and fair chances of success to all who are seeking to realize their potential through higher education, while eradicating all forms of unfair discrimination and advancing redress for past inequalities;
- meet, through well-planned and coordinated teaching, learning, and research programmes, national development needs, including the high-skilled employment needs presented by a growing economy operating in a global environment;
- support a democratic ethos and a culture of human rights by educational programmes and practices conducive to critical discourse and creative thinking, cultural tolerance, and a common commitment to a humane, non-racist, and non-sexist social order;
- contribute to the advancement of all forms of knowledge and scholarship, and in particular address the diverse problems and demands of the local, national, southern African, and African contexts, and uphold rigorous standards of academic quality.

1.15 This vision for higher education is located within the government's broader view of a future where all South Africans will enjoy an improved and sustainable quality of life, participate in a growing economy, and share in a democratic culture.

1.16 The Ministry's vision and programme for transformation are based on a set of underlying principles and goals which provide guidelines for assessing the higher education system.

…

1.27 At the national or system level the goals are:

1. to conceptualise, plan, govern, and fund higher education in South Africa as a single, coordinated system;
2. to provide a full spectrum of advanced educational opportunities for an expanding range of the population irrespective of race, gender, age, creed, or class or other forms of discrimination;
3. to diversify the system in terms of the mix of institutional missions and programmes that will be required to meet national and regional needs in social, cultural, and economic development;
4. to facilitate horizontal and vertical mobility by developing a framework for higher education qualifications which incorporates adequate routes of articulation, as well as flexible entry and exit points;
5. to improve the quality of teaching and learning throughout the system and, in particular, to ensure that curricula are responsive to the national and regional context;
6. to promote the development of a flexible learning system, including distance education and resource-based learning based on open learning principles;
7. to secure and advance high-level research capacity which can ensure both the continuation of self-initiated, open-ended intellectual inquiry, and the sustained application of research activities to technological improvement and social development;
8. to promote and develop social responsibility and awareness among students of the role of higher education in social and economic development through community service programmes;
9. to produce graduates with the skills and competencies that build the foundations for lifelong learning, including, critical, analytical, problem-solving, and communication skills, as well as the ability to deal with change and diversity, in particular, the tolerance of different views and ideas;
10. to develop capacity-building measures to facilitate a more representative staff component which is sensitive to local, national and regional needs, and is committed to standards and ideals of creative and rigorous academic work;
11. to ensure transparent and cost-effective management aimed at optimal use of available resources;
12. to develop and implement funding mechanisms in line with the principles outlined above and based on need, affordability, sustainability, and shared costs, and in support of the goals of the national higher education plan.

These two examples of policy documents are of the above-mentioned 'declarative' type, since they contain no indicators or quantitative targets. Indicators and targets may, however, be laid out in the planning documents that operationalize policy declarations. The linkage of policy declarations with indicators is both a technical and a political task, because the chosen indicators will provide clarity on what precisely is supposed to be achieved. *Chapter 3* will discuss this aspect in more detail.

Exercise 3

Identify a few objectives of your higher education policy or plan or a few development objectives of your higher education institution.

CHAPTER 3

METHODOLOGICAL ASPECTS OF AN INDICATOR SYSTEM

An indicator system is a set of indicators that have been selected to shed light on certain aspects of a higher education system or institution. The indicators are tools that should provide a portrait of the state of the system, both in itself and in relation to its component parts or the country as a whole. This chapter will focus on indicator systems for the higher education system, while those for individual institutions will be discussed in a subsequent chapter.

3.1 What is an indicator?

Indicators are widely used statistical and analytical tools. Before defining what an indicator *is*, we should define what it *is not*.

An indicator is not raw data

A series of tables produced for an annual statistical report is not an indicator system. These tables are no doubt very useful, allowing for example those in charge of a programme to know the number of students registered, but they do not constitute an indicator. An indicator associated with these data could, for example, be the proportion of the target population that could enrol in a particular programme or average class size (number of students per professor). In terms of the potential for analysis, the difference between raw data and an indicator is described below:

An indicator is a synthesis of data that can be analysed

Indicators can be defined as 'shortcuts', 'abbreviations', or 'substitutes' of an underlying reality. They are calculated from raw data using statistical tools such as percentages, rates, ratios, and indices.

It is strongly recommended, however, that an indicator system include some large-scale raw data, such as total student population by level or discipline, which can serve as a basis for calculation of indicators such as growth rates or percentage breakdowns of the student population by various categories.

In addition, an objective may be defined by a number – for example, increasing the number of professors by 5,000. In this case, the number can be indicated, but this would be an exception to the rule of not including too much raw data or too many numbers.

In an indicator system, the two categories of information should be combined, but only the most relevant raw data should be selected and only a very limited set presented. This will be discussed later in this publication.

Indicators summarize a considerable amount of data, the goal being to present an overview or general indication of the situation we are analysing, without necessarily including comments on whether this situation is positive or negative. To summarize:

- Indicators provide a 'snapshot' or a profile of existing conditions at a given moment in time, describing the status of an education system at various levels.
- Indicators afford a better understanding of certain aspects of reality without judging them.
- Indicators provide a means of presenting the performance or behaviour of an education system to stakeholders.

Goals of indicators

Indicators are employed for the following purposes:

- to determine the state of an education system;
- to monitor its development and progress over time (compared to, for example, predefined objectives with numbers attached to them);
- to measure its strengths and weaknesses;
- to assess the degree of inequality in the provision of services;
- to inform policy-makers on the functioning and efficacy of the education system, but also to report its condition to the entire education community, and indeed to the whole country.

3.2 What are the criteria for a 'good' indicator?

As indicated in a number of publications on the topic, we can list certain characteristics of a good indicator:

- relevance;
- capacity to summarize information without distorting it;

- a structured and multifaceted nature, allowing it to be linked to other indicators resulting in an across-the-board analysis of the system;
- precision and comparability;
- reliability and accuracy;
- timeliness (it should present information on recent years in a timely manner).

It should provide a means of:

- measuring the work to be done in order to meet a given objective;
- identifying problematic or unacceptable situations;
- responding to policy concerns and to the questions that led to its being chosen as an indicator;
- comparing its current value to a reference value, a standard value, or its value over a different observation period.

A set of indicators should function like the dashboard of a vehicle. It should help reveal the existence of any problems and facilitate their measurement. A detailed diagnosis and search for a solution can be done by conducting analyses and complementary research. An obvious but appropriate image is that of the warning light on a dashboard indicating that the engine of your vehicle is overheating: when it lights up, the mechanic must find the cause(s) of the problem as well as solutions to remedy the situation.

There is often a strong temptation to add raw data to an indicator. This should be resisted in order to preserve the proper nature of the indicator.

The cost of producing an indicator should also be taken into consideration. In fact, indicators are often chosen without regard to their cost, which can, however, be very substantial. For example, a decision might be made to assess all higher education programmes by analysing the employment situation of their graduates. This is a worthwhile external criterion of evaluation but requires a complex survey that must be conducted twice – in the short term following graduation and in the long term (for example, three years after graduation). Maintaining contact with all the students and obtaining responses from them is not always easy and requires substantial funds. Similarly, measuring the efficacy of a project management system requires implementing a system that provides all the information needed to calculate certain indicators. This creates an additional burden on the management process itself, thereby generating additional costs. It is therefore very important to consider the costs of an indicator and make decisions about it based on available funds.

To summarize, indicators play a key role in managing and evaluating education systems in general, and higher education systems in particular. They are the basic components of scorecards, both at national level and for individual institutions.

3.3 What should be measured?

To develop good indicators, it is necessary to identify the phenomena that are most worth measuring. These can depend on a country's choices, inspired by its education policy objectives, or an institution's choices in defining its own plan or project. The relevance of other indicators may be more wide-ranging or more descriptive, but their importance depends on the particular context.

The enrolment rate at all levels of education is a good indicator, in particular for measuring participation. This indicator loses much of its significance, however, when a country attains a relatively high gross enrolment rate in levels 5 and 6 of the International Standard Classification of Education (ISCED), since enrolments may include a large share of mature students and adult learners. Enrolment rates should be complemented by other indicators, such as the entry rate into higher education or first graduation rate.

Indicators in higher education should also have a descriptive aim. A simple, precise overview of the whole system is necessary. It should provide points of comparison in the analysis of various phenomena. Moreover, it is essential to present data covering a number of years, since certain aspects of a system can be observed only over a period of time. Finally, indicators should cover differences or disparities in geographic or socio-demographic characteristics such as sex and income levels.

In addition to these descriptive aspects, indicators should provide data for the analysis of education policy. By grouping indicators, it is possible to search for ways of understanding and explaining cause-effect relationships in the functioning of the education system in order to preserve transparency. Such interpretations are rather tricky, however, and hence it is important that the selected group of indicators allow for a variety of points of view. This is not easy to achieve, but it is the only way

of providing a management tool for policy-makers and a means of understanding the current situation for society at large.

3.4 Typologies of indicators, or how to classify indicators by category

Categories of indicators vary from one publication to another

If 'analysis of operations' is of primary importance, we can classify indicators by resources (funding, staff), activities, and results, supplemented by a description of the social and cultural environment. This is a very appealing approach from the standpoint of a published scorecard. Sometimes we can also distinguish between **result** and **impact**. The former is an immediate measure of education, and the latter a measure of the consequences of education for the situation of an individual, a group, or the society to which they belong.

If we want instead to categorize indicators by various entities, we can use **institutions, students, professors,** and **costs**.

Two publications use the first type of classification: *The State of Higher Education and Research* (France) and *Education at a Glance* (OECD).

Example 3 presents the typology used in *The State of Higher Education and Research in France*, which classifies indicators by theme.

Example 3: France – Categories of indicators in *The State of Higher Education and Research in France*

Themes	Indicators
Costs	Expenditure on higher education
	Expenditure on higher education in France and OECD countries
	Student aid
Staff	Higher education staff remunerated by the Ministry of Higher Education and Research
	Higher education teaching staff
	Qualification and recruitment of teacher-researchers
Activities	Success on the *baccalauréat* examination
	Access to higher education
	Recruitment to the principal higher education streams
	Enrolment in higher education
	Foreign students in higher education
	Girls and boys in higher education
	Student life: studies, schedule, and trends in lifestyles
	Continuing education in higher education
Results	Success in university
	Success in other streams
	Level of education and qualifications of young people leaving initial education
	Level of education by socio-economic background
	Employment and career of higher education graduates
	Qualifications, social status, and salary

This method of classifying indicators is the closest to an explanatory model of an education system. The three components are tightly linked and multifaceted.

We can also group indicators under major outcomes such as students' level of knowledge, preparation for the labour market, preparation for civic or social life, equality, or democratization of education. In this case, we are measuring the efficacy or efficiency of an education system in these areas. However, these themes are more appropriate for a cross-sectional analysis of indicators than for a document presenting an indicator system that has a certain internal logic to its layout.

Another approach to an indicator system, which consists in showing each education policy objective with the indicators used to monitor it, is presented in *Chapter 4*.

These examples suggest that it is ultimately the Resources/Activities – Process/Results layout that most facilitates the reader's analysis of the indicator system, because it closely resembles an explanatory model of an education system, as indicated above. We can also add socio-demographic characteristics that interact with each component and, in the 'Results' (or 'Findings') part, present a set of indicators related to internal functioning (exam pass rates, dropouts) and another set related to the impact of education on salaries and wages, jobs, and socio-demographic characteristics.

The 'qualitative/quantitative' debate

Indicators can definitely be defined for so-called qualitative aspects. This is a more complicated and delicate matter than in the case of quantitative indicators, but there is always a way of measuring quality if it is clearly defined. For example, it is possible to measure the 'quality of education' by specifying what this term means. If it means the quality of professors, their qualifications should be measured. If it means students' learning outcomes, their cognitive and other acquired skills should be measured. If it means the quality of resources, parameters such as the number of library books per student should be measured. The quality of student support services, such as counselling and guidance, can also be measured. It is even possible to group all these data into a composite indicator so that institutions can be compared. To summarize, the apparent opposition between qualitative and quantitative indicators can be resolved through a clear definition of what is being measured. Such clarity is essential in order to give stakeholders a clear understanding of the current state of affairs in the higher education system.

3.5 Steps in developing an indicator system

Ten steps are required in developing a list of indicators or scorecard. The first ones have already been briefly covered in this chapter.

- Step 1: Identify or define objectives.
- Step 2: Create a list of 'policy' issues based on the objectives.
- Step 3: Develop a list of indicators.
- Step 4: List the data required to calculate the indicators.
- Step 5: Locate the data sources available.
- Step 6: Calculate the indicators.
- Step 7: Verify the results.
- Step 8: Analyse the indicators.
- Step 9: Select the final indicators for the system.
- Step 10: Select the layout of the indicator system document.

Steps 1 to 5 will be covered again in more detail in *Chapters 4* and *5*. They will be applied to the monitoring of a higher education system or an institution.

Steps 6 to 10 will be covered in *Chapter 6*.

Exercise 4

Based on the objectives chosen in *Exercise 3*, develop some indicators that could measure them. Indicate what policy issues could be addressed by these indicators.

CHAPTER 4

USING INDICATORS FOR OVERALL MONITORING OF A HIGHER EDUCATION SYSTEM

This chapter examines each step in developing an indicator system by applying it in a very concrete way to higher education. It begins by covering indicators for overall monitoring of a higher education system so as to inform the general public or to monitor a particular policy. At each step, examples of existing sets of indicators or scorecards will be provided to facilitate understanding of the approaches covered.

4.1 Monitoring a higher education policy or plan

The first step in building a set of indicators consists of identifying major policy objectives or, if they have not been explicitly specified, defining them.

The three examples presented below, from the European Union (EU), South Africa, and Mauritius, show how various countries have indicated their objectives in their policy declarations or strategic plans.

Example 4: European Union – Education and training objectives for 2010 (Lisbon Strategy)

The EU matched its 2010 goals with indicators to assess progress towards the achievement of these goals.

Education and training policies constitute a major element of the Lisbon Strategy. They should actively contribute to the overall goal, which is to make the EU a leader in today's knowledge-based economy.

The heads of state or government requested 'not only a radical transformation of the European economy, but also a challenging programme for the modernization of social welfare and education systems'.

In 2007, the EU defined 20 core indicators and benchmarks (*Appendix 4*) related to 8 key policy domains. The 20 indicators and benchmarks were to be considered a coherent framework.

Four of these indicators are linked to goals for higher education, namely:

- to improve the quality of higher education institutions;
- to develop investment in higher education;
- to increase the number of graduates of higher education institutions, particularly in mathematics, science, and technology;
- to increase student mobility.

EU Member States and the European Commission strengthened cooperation in 2009 with a strategic framework for European cooperation in education and training ('ET 2020'), a follow-up to the Education and Training 2010 work programme launched in 2001.

Example 5: South Africa

In 2001, the Department of Education published the National Plan for Higher Education in South Africa (NPHE).The NPHE lays out the implementation framework and the strategic interventions for the 1997 White Paper on Education. The plan presents the following five major objectives:

1. producing the graduates needed for social and economic development in South Africa;
2. achieving equity in the South African higher education system;
3. achieving diversity in the South African higher education system;
4. sustaining and promoting research;
5. restructuring the institutional landscape of the higher education system.

For each of these major objectives, a number of related outcomes were defined (see *Example 11*).

Example 6: Mauritius

Mauritius recently established a Tertiary Education Commission (TEC), which defined a strategic plan for 2007–2011. The goals of the plan are as follows:

- to create an enabling environment for Mauritius to emerge as a regional knowledge hub and a centre for higher learning and excellence;
- to contribute significantly in the rapid transformation of Mauritius into the rank of developed countries;
- to develop open and distance learning (ODL) as an instrument to increase access to post-secondary education and lifelong learning locally and regionally;
- to bring post-secondary education provision in line with international standards and quality;
- to encourage institutions to mount programmes that are relevant to the needs of learners, the country, and the region;
- to promote and enhance teacher education and training in order to raise the standards of the feeder system to post-secondary education;

- to instil the principles of good governance, transparency, and accountability in the post-secondary education system;
- to ensure optimum use of resources in tertiary education institutions;
- to sustain research and consultancy;
- to foster regional and international understanding and cooperation through a diversity of students and overseas institutions;
- to reinforce and empower the TEC to fulfil its mission and objectives.

4.2 Moving from objectives to indicators

Once an initial list of objectives has been established, a set of indicators should be attached to each objective. One method of doing so is to ask a question that helps pinpoint the objective to be measured.

Table 4.1 illustrates this process. It indicates how, on the basis of an objective, one can formulate a question, the answer to which provides a means of monitoring the objective. Then an indicator is chosen that responds to the question.

Table 4.1 Sample of the process of moving from an objective to an indicator

Objective ➔	Question ➔	Indicator ➔
Increase the volume of first entrants	What proportion of an age group enters higher education?	Entry rate into higher education
Increase the internal efficiency of higher education	Are there many dropouts?	Ratio of the number of entries into a first degree programme to the number of students obtaining a first degree in higher education
	What is the average time spent in higher education to obtain a first diploma/degree?	Average time spent to obtain a diploma/ degree
Improve the management of resources and expenditures	What is the cost per student, in a given year, for a graduate?	Expenditure per student Average expenditure on a graduate

Obviously, the same indicator can be used for several objectives. A number of examples are presented below.

Example 7: UNESCO – Objectives, questions, and indicators

Following the World Declaration on Higher Education for the Twenty-First Century, a list of questions related to the major goals listed in *Example 1* (*Section 2.4*) was prepared and a set of indicators was defined to respond to these questions (Fielden and Abercromby, 2001).

The objective of equal access to higher education, one of the major goals indicated in the World Declaration, is examined as an example.

1st Question: How can we gain an indication of the equality of access to higher education regardless of race, gender, language, religion, age, socio-economic status, and/or physical disabilities?

Indicators suggested:

- change over time in number/gender of higher education students per 100,000 inhabitants;
- net admission rates by mode of participation, age, and gender;
- participation in lifelong learning, by type of education or training and by income level;
- perceived barriers to participation in continuing education and training.[2]

2nd Question: How well are institutions establishing systems of access for the benefit of all individuals who have the necessary abilities and motivations to attend higher education?

2. Fielden and Abercromby (2001) suggest collecting this information by means of a qualitative survey.

Indicators suggested:

- student enrolment in open-learning and distance-learning institutions;
- student retention rates;
- student promotion rates;
- funding for adult education and training;
- locations of adult education and training;
- media for adult education and training.

3rd Question: How can we test the participation and decision-making roles of women at all higher education levels and in all disciplines?

Indicators suggested:

- change over time in gender balance of staff and students;
- presence of female administrators and managers.

4th Question: How well are higher education institutions' programmes removing gender inequalities in curricula and research, and achieving balanced representation among all levels of management?

Indicators suggested:

- graduation by age, gender and field of study;
- number and percentage of female professors by level of education;
- index of variation in gender gaps.

5th Question: What is the level of support given to students, to raise enrolment levels and to expand participation of minorities, disadvantaged groups, and disabled people in higher education in the public and private sectors?

Indicators suggested:

- reasons for failure or non-completion of courses;[3]
- scholarships granted to households and student loans;
- public subsidies and financial aid to tertiary students;
- staff/student ratios;
- expenditure per student relative to gross domestic product (GDP).

Example 8: European Union – Objectives and indicators

Of the 9 core sub-goals and 29 indicators that the EU established after the Lisbon conference (see *Appendix 2* for the complete list), 2 sub-goals and 8 indicators concerned higher education (*Table 4.2*).

Table 4.2 Links between higher education objectives and indicators in the European Union (2004)

Objective	Indicator
Increase enrolment in the sciences and technology	10. Students enrolled in MST[4] as a proportion of all students
	11. Graduates in MST as a percentage of all graduates
	12. Total number of tertiary MST graduates
	13. Number of graduates in MST per 1,000 inhabitants
Develop the mobility of students and international cooperation	26. Inward/outward mobility of teachers and trainers, Erasmus + Leonardo
	27. Inward/outward mobility of Erasmus students and Leonardo trainees
	28. Foreign tertiary students as a percentage of all students enrolled, by nationality
	29. Percentage of students of the country of origin enrolled abroad

3. Fielden and Abercromby (2001) suggest collecting this information by means of a qualitative survey.
4. Mathematics, sciences, and technology.

As previously indicated, in 2007 the EU established a new group of 20 indicators, of which 4 are concerned with higher education. Adding these to the 8 indicators in *Table 4.2*, we obtain 12 indicators to monitor progress towards the goals indicated in *Section 4.1*.

Table 4.3 Links between objectives and indicators in the European Union (2007)

Objective	Indicator
Improve the quality of higher education institutions	International rankings
Develop investment in higher education	Expenditure on higher education as a percentage of GDP
	Private and total expenditure as a percentage of GDP
Increase the number of graduates of higher education institutions, particularly in MST	Student populations and their growth rates by field
	Growth in the number of graduates by field
	Growth in the number of graduates in MST
	Percentage of female graduates in MST
	Student populations by ISCED level per 1,000 inhabitants 20–29 or 25–34 years of age
Develop student mobility	Percentage of foreign students relative to all students (ISCED levels 5 and 6[5])
	Number of students enrolled outside of their country of origin as a percentage of the total number of students
	Flow of students entering or leaving the European Union
	Number of students incoming and outgoing in the Erasmus programme, per 1,000 students

Example 9: France

For each of the policy objectives in the *Loi organique pour la loi de finances* (LOLF), the government of France set one or several indicators to monitor the progress and attainment of these objectives.

Table 4.4 Matching indicators with objectives in France

Objective	Indicator
1) Respond to the need for higher qualifications	Percentage of an age group with a higher education qualification
	Employment rate of young graduates three years after graduating with their first degree/diploma in higher education
	Percentage of graduates following the bachelor's-master's-doctorate qualifications structure
2) Raise success rates at all levels of education and training	Proportion of students enrolled in short-cycle STS and IUT[6] programmes among holders of *baccalauréat*s in technology and professional programmes pursuing studies in higher education
	Young people leaving higher education without a qualification
	Percentage of bachelor's degrees (*licences*) obtained in three years
	Success rates in STS and DUT[7] programmes by type of *baccalauréat* (general, technological, or professional)
	Percentage of doctoral graduates with research stipend who presented their thesis in a maximum of three years
3) Rationalize the supply of higher education	Percentage of secondary campuses where the number of students is less than 1,000
	Number of engineering schools grouped together
	Proportion of students in courses with low student populations, at bachelor's (*licence*) and master's level

5. ISCED 5A = long-duration higher education programmes; ISCED 5B = short-duration higher education programmes; ISCED 6 = doctoral studies.
6. STS: Section de techniciens supérieurs (a post-secondary professional/technical track). IUT: Institut universitaire de technologie (university institute of technology).
7. STS: Section de techniciens supérieurs (a post-secondary professional/technical track). DUT: Diplôme universitaire de technologie (university diploma in technology).

4) Make higher education a productive instrument for lifelong learning	Percentage of graduates from continuing education compared to the total number of graduates
	Number of students receiving credit for prior learning in universities and in the *Centre national des arts et métiers* (CNAM)
5) Increase the attractiveness of French education internationally and the integration of the French system into the European and world systems	Measure of student mobility (among OECD countries)
	Proportion of foreign students enrolled in master's and doctorate programmes (not holders of a *baccalauréat* from France)
	Ratio of foreign graduates to total graduates (bachelor's and master's)
	Number of joint study programmes (master's and doctorate)
6) Optimize access to library resources for education and research	Measure of the weekly availability of seats in the library
	Number of documents communicated on site, lent out, and downloaded; rate of requests fulfilled
7) Produce scientific knowledge at a world-class level	Scientific production by university departments
	Recognition in the scientific community of the work produced by university departments
8) Develop dynamism and rapid response to research developments	Speed of university departments' response to current research developments
9) Contribute to improving the competitiveness of the French economy through knowledge and technology transfer	Proportion of patents registered by university departments
	Proportion of funds (for example, royalties) received by university departments through licence fees for intellectual property
	Proportion of university department funds derived from research contracts with companies
10) Enhance the attractiveness of French research at the international level	Attractiveness of university departments
11) Participate in the European Research Area	Participation rate of university departments in projects funded by the European Union Research and Development Framework Programme
	Coordination rate of university departments in projects funded by the European Union Research and Development Framework Programme
	Share of articles co-published with a member country of the EU (EU25) among all articles published by university departments
12) Optimize the management of higher education institutions, including the management of facilities	Percentage of institutions with a self-evaluation or quality assurance mechanism
	Amount of income derived from services
	Proportion of income derived from services over income for recurrent expenditure, other than tuition fees
	Utilization rate of facilities

4.3 Analysing the performance of a higher education system

In constructing an indicator system, we often find that the same major themes recur. The principal themes are described below:

Access

Most countries wish to widen access to higher education, but some would like to control incoming student flows, sometimes even from the secondary school level.

Several indicators have been used to measure access:

- the transition rate from secondary school to higher education;
- the proportion of an age group entering higher education;
- the gross enrolment ratio.

These indicators can be broken down by province, sex, and socio-economic status to reveal inequalities.

Internal efficiency

This is also a concern of most countries. Not all students who enter higher education obtain a qualification. Therefore, the issue here is to improve guidance and counselling so that each student pursues studies in which he or she has the greatest chance of graduating and to develop programmes of study that result in the highest number of students graduating.

The indicators most often used are the following:

- graduation rate for a first qualification in higher education,
- success rate by average number of years spent in higher education,
- dropout rate by programme of study and type of secondary school qualification.

Relevance and external efficiency

The development of links between higher education and the economy is another common concern of countries. It is thus very important to have information available on what happens to students after they leave their higher education institutions. The problem here is the difficulty in measuring this, because systems that can regularly produce surveys covering people's post-tertiary lives are costly. However, data from labour force surveys can certainly be of use here.

In any case, we can use the following indicators:

- employment rate of graduates from higher education,
- unemployment rate of graduates from higher education,
- proportion of graduates from higher education institutions with a job as a percentage of people 25–64 years of age,
- salaries and wages of graduates from higher education.

With no accurate data on graduates in the labour force, Cameroon has decided to measure employability by measuring the size of professional and technical streams.

The future of students after leaving university is thus an important topic but one for which there is a paucity of data in most developing countries. We will return to this in *Chapter 7*.

Quality of education

Quality is also a major concern of every country. A focus on quality should be developed in each institution. This is why we pursue this theme in *Chapter 5*, 'Using indicators for planning and monitoring in higher education institutions', and in *Chapter 7*, 'How to organize and manage the production of an indicator system'.

A number of countries have implemented quality assurance policies for their higher education systems.

Professionalization of higher education

Faced with the difficulty of employment for students exiting purely academic programmes of study, most countries have developed or wish to develop professional programmes that are relatively short in duration – two or three years. Problems often arise, however, as a result of the lack of precision in identifying such programmes and the absence of accurate statistics on them.

Cameroon attaches great importance to these programmes, as do France (*Table 4.4*, p. 37) and Tunisia (*Table 4.5*, p. 40).

The indicators being used are the following:

- proportion of students in professional programmes,
- success rate of these programmes,
- employment after these programmes (average time to find first employment after graduation).

Capacity for research and innovation

This is an important topic that merits a guide all by itself. We have therefore decided not to pursue it here, despite all the strong links it has with higher education.

The indicators most often used to measure research and innovation capacity are:

- number of publications,
- number of patents,
- expenditure and staff related to research and development.

Equity

Reducing inequalities in access to and success in higher education is also a very important concern

for most governments. It is therefore essential to have a number of indicators on this theme.

These indicators generally apply to various socio-cultural groups (females or males, socio-economically disadvantaged groups, ethnic minorities, and so forth) and provide information on their:

- entry into higher education,
- participation in higher education,
- retention, and
- success.

Costs and expenditures

On the topic of costs and expenditures, the indicators most often used are the following:

- public expenditure on higher education as a percentage of GDP,
- public expenditure on higher education as a proportion of total government spending,
- average expenditure per student in higher education,
- average expenditure per graduate of higher education,
- the relative shares of public and private expenditure on higher education.

Examples 10 and *11* below illustrate how these major themes are treated.

Strategic and operational management capacity

Providing indicators on the strategic and operational management capacity of a higher education system is a priority, because it is a major concern in most reform projects and therefore a frequent objective in improving policies and planning in higher education.

The problem is that strategic and operational management capacity is difficult to measure. The most common approach is to use 'proxy' indicators, such as the proportion of a budget or a programme that is not executed. Indicators can also be based on surveys of 'consumer' satisfaction with administrative services or the number of measures taken to resolve administrative irregularities or problems.

Exercise 5

Do you think that the above list of approaches and indicators is exhaustive? What other topics could be important in terms of analysing the performance and functioning of your higher education system?

Example 10 presents the case of Tunisia's indicator system. Although it seems that Tunisia did not explicitly define the goals to which these indicators are linked, it is interesting to see which indicators were used for each of the main themes: enrolment, diversification, graduates, programmes of study and degrees, academic staff, higher education institutions, budget, partnerships, private higher education institutions, university publications, computer science education, and lifelong learning.

In addition Tunisia chose to include general data into its indicator system, as well as indicators properly speaking. This is sometimes justified when we wish to compile and present, as best we can in a limited space, essential data along with the indicators we have chosen. However, the use of 'raw' data should not be overdone.

Example 10: Tunisia

Table 4.5 Indicator system for higher education in Tunisia

Theme	Indicator
Enrolment	Trend in enrolments[8]
	Trend in enrolment in the sciences and engineering
	Enrolment rates in university of the 20–24 age group
	Trend in enrolments by sex
	Percentage of females (compared to international percentages)
	Tunisian scholarship holders studying abroad, by country where they are enrolled

8. It should be noted that the second column contains titles of indicators and that some of these are not indicators *stricto sensu*.

	Tunisian students without scholarship studying abroad
	Foreign students enrolled in Tunisian universities
Diversification	Distribution of students by study field (ISCED classification)
	Students in short-cycle programmes
	New entrants into short-cycle programmes
	Diversification and modernization of short-cycle programmes
Graduates	Distribution of graduates by study field
	Distribution of graduates by ISCED classification and type of qualification
	Trend in science and engineering qualifications
	Trend in higher education qualifications
Programmes and degrees	Higher education programmes
	Higher education degrees
	Qualifications without repetition
	Trend in enrolments in promising programmes of study
	Trend in enrolments in computer science, multimedia, and communications
	Building or strengthening short-cycle study programmes
Academic staff	Academic staff working full-time in Tunisian universities by level, method of recruitment, university, and sex
	Visiting professors
	Trend in the number of academic staff
	Trend in the number of academic staff by rank
Higher education institutions	Trend in enrolments by university
	Universities by region
	Distribution of higher education institutions and new enrolments by university
Budget	Higher education budget
	Higher education budget as a share of total government budget and of GDP
Partnerships	Partnerships with foreign universities
	Grants to scientific organizations
Private higher education institutions	Enrolments in private higher education institutions
	Enrolments in computer science, multimedia, and telecommunications in private higher education institutions
Student support body	University housing
	University scholarships and loans
Computer-assisted teaching	Computer-assisted teaching
Lifelong learning	Distribution of students who have repeated an academic year twice, by university
	Re-entries into higher education and success rate
	Supplementary education or training

Example 11: South Africa

The National Plan for Higher Education in South Africa (2001) proposes to match the overall objectives for higher education with a number of measures of quantitative and qualitative outcomes.

Overall objectives:

1. producing the graduates needed for social and economic development in South Africa;
2. achieving equity in the South African higher education system;
3. achieving diversity in the South African higher education system;
4. sustaining and promoting research;
5. restructuring the institutional landscape of the higher education system.

Outcome measures:

1. increased participation rate, increased graduate outputs, broadened social base of students, increased recruitment of students from Southern African Development Community countries, enrolment by fields of study, enhanced cognitive skills of graduates;
2. increased equity in participation rates, improved staff equity;
3. differentiation by mission and programmes, regulation of distance programmes at residential institutions, establishment of a single dedicated distance education institution, regulation of private higher education;
4. research concentration and funding linked to outcomes, increased graduate outputs at the master's and doctoral levels;
5. programme and infrastructural collaboration, number of higher education institutions, and new institutional and organizational forms.

4.4 Sources of data

The main data source for indicators is annual statistical surveys, conducted in general by a department or section in the ministry responsible for higher education. These surveys are based on data collected in higher education institutions. The quality of the indicators therefore depends on the quality of the data collected in these institutions. The greater autonomy of institutions makes it all the more important to maintain data compilation at the national level by the government. Failure to do so will mean that the accurate and comparable information needed to manage the higher education system will not be available.

Data on student enrolments by discipline, graduates, and academic staff come from these surveys.

To calculate enrolment and entry rates, it is necessary to use population data by age, which in general are produced by government statistical departments.

To obtain data on the situation of students after graduation, we must often use specific surveys on graduates such as tracer studies. Data can be derived from an organization or institution that specializes in these types of survey, for example the CEREQ[9] in France or the Higher Education Statistics Agency (HESA)[10] in the United Kingdom. In some cases, government statistical departments can provide these data.

For funding or macroeconomic data, it is once again the government's statistics department, or sometimes the Ministry of Finance, that can provide the information needed to calculate indicators.

Financial records or files can also be used to generate statistics. For example, pay records of academic staff can provide quite valuable statistical information.

Finally, it should be noted that calculating certain indicators will require specific surveys. One should always strive to limit the number and, if appropriate, the scale of these surveys by conducting polling-type surveys as often as possible.

We cannot over-emphasize the importance of working on these sources of data to obtain quality information. The quality of the indicator system depends on the quality of these sources.

Exercise 6

What questions can we ask concerning each of the objectives chosen in *Exercise 3*, and what indicators could answer these questions?

Exercise 7

For each indicator, please indicate the source of data.

9. The *Centre d'études et de recherches sur les qualifications* (CEREQ) organizes surveys of a sample of people exiting from the education system ('exiting generations') three, five, and seven years after they leave the education system (www.cereq.fr).
10. HESA publishes the annual survey 'Destinations of Leavers from Higher Education Institutions' as well as a longitudinal survey on the same topic (www.hesa.ac.uk).

CHAPTER 5

USING INDICATORS FOR PLANNING AND MONITORING IN HIGHER EDUCATION INSTITUTIONS

This chapter contains excerpts of specific strategic plans of two universities, one in Europe and the other in a middle-income country, Malaysia. It also describes the process of transition from strategic goals to indicators in these universities, as well as in French universities under the new public finance law entitled *Loi organique pour la loi des finances* (LOLF).

As outlined in *Chapter 1*, it has become common practice worldwide for universities to prepare strategic development plans that are accompanied by a monitoring system, such as a scorecard. Within this context, the 'balanced scorecard' (BSC) concept is growing in currency. The balanced scorecard approach was developed by Kaplan and Norton (1992) as a performance measurement framework for the corporate sector that added strategic, non-financial measures to traditional financial ones. As a consequence, the BSC is a strategic planning and management system used to align business activities with the organization's vision and strategy and to monitor its performance against strategic goals.

The balanced scorecard presents a framework for measuring organizational performance in terms of four key perspectives:

- customer satisfaction,
- enhancement of internal processes,
- the creation of capabilities in employees and systems, and
- the financial perspective.

In each of these areas, it is necessary to define a handful of measures that are most critical to the university's performance. Thus, the balanced scorecard proposes to monitor core elements of an organization's strategy.

5.1 Developing an indicator system to monitor a university's strategic plan or project

The two examples that follow illustrate the linkage between strategic planning at the university level and the construction of a scorecard for monitoring the strategic plan. The University of Edinburgh, founded in 1582, is an internationally renowned university well placed on international rankings for its research performance. Universiti Teknologi Malaysia (UTM) is the oldest public engineering and technological university in Malaysia. It specializes in technical studies, with separate faculties for education, pure sciences, management, and human resources development. UTM has more than 20,000 students, of whom over 25% study at the post-graduate level. It has thus considerable potential in the area of fundamental and applied research.

Example 12: The University of Edinburgh

The university's strategic plan 2004–2008 includes the following mission statement and operational priorities.

Our mission

The University's mission is the advancement and dissemination of knowledge and understanding. As a leading international centre of academic excellence, the University has as its core mission:

- to sustain and develop its position as a research and teaching institution of the highest international quality and to benchmark its performance against world-class standards;
- to provide an outstanding educational environment, supporting study across a broad range of academic disciplines and serving the major professions;
- to produce graduates equipped for high personal and professional achievement; and
- to contribute to society, promoting health, economic, and cultural well-being.

As a great civic university, Edinburgh especially values its intellectual and economic relationship with the Scottish community that forms its base and provides the foundation from which it will continue to look to the widest international horizons, enriching both itself and Scotland.

Core strategic goals and aims

Core strategic goal 1: Excellence in education – to be a leading international provider of undergraduate and postgraduate education that meets high academic standards and enables all who can benefit to realize their full potential.

Core strategic goal 2: Excellence in research – to build on our standing as one of the world's leading research-intensive institutions; to be a vibrant research community that stimulates new ideas and discoveries; and to contribute to the economic, social, cultural, and environmental development of Scotland and the world.

Core strategic goal 3: Excellence in knowledge transfer and commercialization – to maximize the potential contribution of our knowledge, ideas, skills, and expertise towards realizing Scottish Executive and UK Government objectives and the welfare of society as a whole.

Operational priorities

Promoting opportunity and diversity
Developing leadership and management
Advancing internationalization
Engaging with the wider community
Building effective partnerships and collaborations
Effective governance and ensuring sustainability

From objectives to indicators

The University of Edinburgh used the balanced scorecard concept to monitor its strategic plan 2004–2008. The balanced scorecard used by the university retains some historically widely used financial measures and supplements these with measures on customer satisfaction, enhancement of internal processes, and the creation of capabilities in employees and systems.

University of Edinburgh balanced scorecard 2007/2008

ORGANIZATIONAL DEVELOPMENT PERSPECTIVE **Sustaining a dynamic institutional profile**		**FINANCIAL PERSPECTIVE** **Use of resources in a cost-effective manner to further strategic aims**	
Performance Indicator ID/name	**Value**	**Performance Indicator ID/name**	**Value**
1. Percentage of full-time undergraduates from Scotland	53.6%	10. Percentage of total income from non-formulaic funding sources	68.1%
2. Headcount of research postgraduate students	3,700	11. Historic cost surplus as percentage of turnover	2.3%
3. Fee income from taught postgraduate students	£19,164k	12. Administrative operating costs as percentage of academic operating costs	11.3%
4. Lifelong learning registrations	15,321	13. Research indirect cost recovery contribution as percentage of total research income	16.1%
5. Flexibility of curriculum	16.1%	14. Commercialization of research: licenses signed	47
6. Research grant applications submitted per member of academic staff	1.28	15. Fundraising: total raised (3 year average) and number of donors	£11.7M
7. Percentage of new appointments at lecturer, senior lecturer/reader and Professor/Chair level who are female	45%	16. Ratio of current assets to current liabilities	1.31:1
8. Number of staff development events attended per FTE member of staff	0.81	17. Usage of key Information Services resources provided, per £ of investment	1.292
9. Percentage of staff on fixed term contracts	23.8%	18. Utilities, maintenance and servicing costs per square metre of gross internal area	£66.13 psm

STAKEHOLDER PERSPECTIVE **Attraction of high calibre students from a broad range of backgrounds to an institution nationally and internationally respected by peers, staff and the public.**		INTERNAL BUSINESS PERSPECTIVE **Consistent support to the University in achieving its mission and strategy.**	
Performance Indicator ID/name	**Value**	**Performance Indicator ID/name**	**Value**
19. Headcount of non-EU international students	3,923	26. Percentage of users satisfied with information services	88.9%
20. Proportion of undergraduates achieving a first or upper second class degree	77.8%	27. Proportion of usable Publication Scheme resources	60%
21. Widening participation: percentage of young full-time first degree UK entrants from state schools/colleges	68.0%	28. Total income per square metre of gross internal area	£980 psm
22. Intake of home/EU students from ethnic minorities as percentage of total intake of home/EU students	6.0%	29. Capital expenditure and planned maintenance as percentage of estate value	5.5%
23. Newspaper cuttings analysis: percentage of column centimetres positive	97.1%	30. Total property cost as percentage of university total income	6.8%
24. % academic staff in 5 and 5* RAE units of assessment	77.4%	31. Backlog maintenance spend required to meet Disability Discrimination Act requirements	circa £5.1M
25. Proportion of students satisfied overall with the quality of their course	82%	32. Room utilization	49.3%

Example 13: Universiti Teknologi Malaysia (UTM)

Our vision

To be recognized as a world-class centre of academic and technological excellence.

Our mission

To be a leader in the development of human capital and innovative technologies that will contribute to the nation's wealth creation.

Goals

Goal 1: Enhance quality education.
Goal 2: Promote excellence in research, innovation, and graduate education.
Goal 3: Enhance professional training and lifelong learning.
Goal 4: Enhance international standing.
Goal 5: Strengthen community outreach.
Goal 6: Provide quality management and effective risk management.

From objectives to indicators

The Universiti Teknologi Malaysia (UTM) also uses the balanced scorecard approach rooted in stakeholder analysis. In addition to presenting key performance indicators for objectives (themselves related to the above six goals), UTM sets overall university targets for 2010 to serve as benchmarks against which the overall performance of the university and its departments will be judged.

2010 UTM Corporate Scorecard

Strategic Objectives		Key Performance Indicators (KPI)	2010 Target
Stakeholder Perspective			
S1: Produce Globally Marketable and Outstanding Graduates	S1.1	% of graduates employed as of convocation	85
	S1.2	Number of students receiving awards at national and international levels	10
	S1.3	Ratio of student application: admission	5:1
S2: Generate opportunities for lifelong learning	S2.1	No. of new executive programmes	10
	S2.2	No. of new professional development programmes/short courses	150
	S2.3	% of FTE students enrolled for executive programmes (target equally divided) from the total enrolment.	500

S3: Notable Technological Research & Innovation Institution	S3.1	Total number of staff accepted as members in the national international professional bodies/associations	National: 500 International: 50
	S3.2	Total number of staff appointed to chairmanship/committee position in the professional bodies/associations at international level	20
S4: Achieve Reputable International Ranking	S4.1	THES Ranking (Top X)	250
S5: Outstanding Contribution to Society	S5.1	No. of high-impact community projects	National: 500 International: 50
P1: Continuous Academic Quality Improvement	P1.1	% of FT programmes accredited by accreditation bodies	100%
	P1.2	% of automated T&L work process	20%
	P1.3	% of UG programmes embedding innovation elements in curriculum (case study, 'Yumekobo' approach, service learning etc.)	20%
	P1.4	No. of external experts/practitioners as visiting/contract/ seconded lecturers for every faculty.	200
P2: Up to date & Industry-relevant Curriculum	P2.1	Employer Perception Index on graduates quality (reflective of curriculum)	80%
P3: Scholarly Publication & Citation	P3.1	Cumulative impact factor of publications	3,000
	P3.2	Non citation index papers	3,000
	P3.3	Book chapters	1,200
	P3.4	No. of original books authored (*karya asli*)	40
P4: Outstanding Leadership and Contribution in R&I	P4.1	% of Research Experienced Staff (cohort) (a) > 20 years	30%
		(b) 10 – 20 years	40%
		(c) < 10 years	30%
P4: Outstanding Leadership and Contribution in R&I	P4.2	Total number of patents granted (national and international)	100
	P4.3	Total number of patents pending (national and international)	300
	P4.4	Total number of IPR other than patents/copyrights (including original writings)	500
	P4.5	a. Total amount of public fundings (from government agencies)-mil	50
		b. Total amount of private fundings (including contract research)-mil	7
		c. Total amount of international fundings-mil	10
	P4.6	a. Total number of awards conferred by national bodies	135
		b. Total number of awards conferred by international bodies	40
	P4.7	% of staff involved as principal researcher	60%
	P4.8	Total number of academic staff involved as principal investigator of research grants i. University funded	700
		ii. National grants	
	P4.9	Total number of staff in joint research projects	480
	P4.10	Number of spin-off companies formed per year	20
P5: Quality Management of Research Postgraduates	P5.1	% of postgraduate intake with CGPA ≥3.0 or equivalent	100%
	P5.2	% of international postgraduates students	40%
P6: Strong National & International Linkages	P6.1	Number of active national/international MoU/MoA/LoI/LoA and collaboration with the industry	80
	P6.2	IMAP as catalyst for international networking	500
P7: Increase Income From Diverse Sources	P7.1	Income generated from training courses-mil	40
	P7.2	Income generated from consultancy (excluding contract research)-mil	60
	P7.3	Gifts (money, equipment, research materials, etc.) (worth > RM 3,000.00) (mil)	3
	P7.4	Endowment	10
P8: Strong Marketing & Branding Capability	P8.1	No of Marketing (branding & promotion) programmes *– Breakdown: Recruitments: 12* *High Impact Branding & Marketing Events: 2*	40

P9: University Social Responsibility (USR) for Community Engagement and Outreach	P9.1	No of staff participating in USR activities *- at least 30 in High Impact Projects, 60 in others*	200
	P9.2	No of new service learning programmes *- free university community elective programmes*	10
P10: Excellent Service Delivery	P10.1	Customer Satisfaction Index	80%
L1: Attract & Retain Key Competent & Productive Staff	L1.1	a. Total number of staff with PhD/DSc, DEng	60%
		b. Total number of staff with professional qualifications (such as medical, engineers, architects, accountants, etc.)	15%
	L1.2	a. Total number of membership in international bodies/ associations.	150
		b. Total number of staff appointed as leader/committee for the international bodies/associations.	25
	L1.3	Competency Index for Support Staff (5 scale)	3.5
L2: State-of-the-art Facilities (Digital Infra)	L2.1	% of facilities for teaching & learning fulfilling the required specification - SMART Classrooms (PHB)	20%
	L2.2	% of facilities for teaching & learning fulfilling the required specification - Digital Infra (CICT)	80%
	L2.3	% increase of library digital content (PSZ)	12%
L3: Condusive Working (Research & Social) Environment	L3.1	Employee Satisfaction Index	80%
F1: Prudent Financial Management / Optimisation of Resources	F1.1	Cost (OE) per student (RM) (Bursary) *Note: To be cascaded as BUDGET VARIANCE to all Tier 1 with target 5%*	19,000

In many English-speaking countries, universities are the main drivers of institutional strategy, but in Continental Europe governments still play a strong role in the steering of higher education institutions. As a consequence, indicator systems developed by universities are also strongly inspired by national goals for the whole higher education system.

Example 14: Universities in France

All universities in France must provide a certain number of indicators related to goals, in the context of either the LOLF or contractual arrangements linking each university to the ministry responsible for higher education.

Three major objectives must be taken into account:

- rationalize the supply of higher education;
- raise success rates at all levels of education and training;
- increase the attractiveness of French education internationally and the integration of the French system into European and world systems.

A group of indicators is associated with each of these objectives.

From objectives to indicators

As indicated above, the objectives assigned to universities in France are accompanied by a group of indicators that provide a means of monitoring and evaluating progress towards their achievement.

Table 5.1 From objectives to indicators in universities in France

Objectives	Indicators
Raise success rates at all levels of education and training	Proportion of enrolments in short-duration STS and IUT programmes among holders of technological or professional *baccalauréats* pursuing studies in higher education
Rationalize the supply of higher education	Proportion of students in programmes with low student populations – Bachelor's (*licence*), Master's
Increase the attractiveness of French education internationally and the integration of the French system into the European and world systems	Success rate of foreign students to total students (bachelor's and master's level)

However, these indicators constitute only a small part of the information and indicators available to an institution. The ministry's Evaluation, Forecasting, and Performance Directorate (*Direction de l'évaluation, de la prospective et de la performance* – DEPP) provides universities with a large number of indicators based on the government's information system on higher education. Using these, we can observe all the major items for which universities have harmonized data sets available.

This is a way of returning quality data to those who provided the basic information and therefore constitutes an application of the virtuous circle of statistics.

Table 5.2 Main fields of indicators for universities in France

The big picture	Study programmes and courses offered
	Students
	Resources
	Degrees granted and success rate
	Research
Place of the university in the university system	Study programmes and courses offered
	Students
	Resources
	Degrees granted and success rate
	Research

5.2 Analysing an institution's performance

In a higher education institution, the general aim of an indicator system is to analyse its performance or, in other words, its strengths and weaknesses. By 'performance' we also mean the institution's ability to attain its goals. Therefore, three areas of focus of analyses should be taken into account: education, research, and management capacity.

Education

It is important to have information on enrolments by discipline, trends in these over time, graduates by programme and degree level, success rates and dropouts by programme or discipline. For example, if the development of applied or professional programmes is part of the strategic plan, special attention must be paid to these programmes. Efforts must also be made to obtain data on the occupational situation of former students. With regard to academic staff, information should be obtained on their status, qualifications, and experience.

Research

As indicated in *Chapter 4*, this area will not be covered in this guide.

Management of institutions

It is important to know the sources of funding and whether trends in funding are in line with the strategic plan – for example, the development of resources generated by the institution.

All the indicators should be analysed in the light of the institution's strategic plan or its goals and objectives.

5.3 Sources of data

The institution itself is a source of data. It can use both the government's information system and its own, which is closely linked to its management. The institution can also design specific surveys to elicit, for example, the opinions of students or academic staff, or information on the employment of graduates (by means of tracer studies).

To calculate enrolment ratios or compare the employment prospects of students to those of the whole population, it will be necessary to use data collected by the government's department of statistics.

Exercise 8

What objectives could be defined for the strategic plan of a higher education institution?

Exercise 9

What questions can we ask about these objectives, and what indicators can we establish to answer these questions?

Exercise 10

What are the sources of these data?

Chapter 6

Calculating indicators, conducting analyses, and presenting the results

The components presented below are common to all types of indicator systems. A list of the principal indicators used and how to calculate them can be found in *Appendix 5*.

6.1 Calculating an indicator

For each indicator, a formula should be clearly defined and presented. In this way, a detailed list of the basic information needed to calculate the indicator can be drawn up.

For example, to calculate the entry rate into higher education one must know the population of new entrants into higher education and compare it to a reference population. The concept of 'new entrants' or 'first-time entrants' should also be defined. We will return to this in *Sections 6.2* and *8.1*.

To calculate the entry rate into a first qualification in higher education, it is important to specify clearly which qualifications (degrees or diplomas) are being taken into account so as to prevent numbers being counted twice. This is also necessary because the same indicator (enrolment rate, entry rate or graduation rate, expenditure on higher education, and so forth) can be calculated in various ways by different people. By being very specific, we can thereby limit, if not totally eliminate, ambiguities and skewed numbers.

At this stage of the process, it is productive to specify how the indicator will be broken down by category (age, sex, province, and so on).

Here are some examples:

Name	Gross enrolment rate in higher education
Purpose	Measures the intake capacity with reference to an age group
Geographic scope	National and regional
Breakdown	By sex
Calculation method	Student population enrolled in higher education divided by the theoretical age for higher education (normally 18–24 years of age)
Source	Statistical survey and demographic data from the country's department of statistics
Validity and accuracy	Good
Frequency	Annual

Name	Entry rate into higher education
Purpose	Measures an age group's access to higher education
Geographic scope	National and regional
Breakdown	By sex
Calculation method	Population of new entrants into higher education divided by the theoretical age of entry into higher education (very often 18 years of age)
Source	Statistical survey and demographic data from the country's department of statistics
Validity and accuracy	Good
Frequency	Annual

Name	Graduation rate for a first qualification in higher education
Purpose	Measures an age group's access to a first qualification in higher education
Geographic scope	National and regional
Breakdown	By sex
Calculation method	Population obtaining a first qualification in higher education divided by the theoretical age of obtaining a first qualification (very often 20 or 21 years of age)
Source	Statistical survey and demographic data from the country's department of statistics
Validity and accuracy	Good
Frequency	Annual

Validity should be clearly indicated by the source that provided the data. The reader can then have a more exact understanding of the information being provided.

It is also important to define the terms we are using. A glossary can therefore be indispensable in the final publication.

For example, we can define:

- **indicators on higher education:** indices, rates, growth rates and quantities calculated from school statistics, and, where necessary, demographic, economic, and other data. They should synthesize the information available to render it more accessible and easier to use for those making use of quantitative data;
- **higher education institution:** administrative unit of education recognized by the government as part of the higher education system;
- **new entrants into higher education:** students registering for the first time in a higher education institution, regardless of the type (university, school, professional education institute, short-term training, and so on);
- **first qualification in higher education:** first qualification obtained in any programme of study in higher education (long-duration university education, short-duration education, engineering school, business school, and so on).

We can also define terms such as 'student', 'professor', and 'private institution'.

6.2 Internal consistency after calculating the indicators

After calculating the indicators, it is necessary to verify the internal consistency of the results. The reason is that the information likely stems from many different sources: statistical surveys conducted by the government department responsible for higher education, demographic data, special survey data, labour force survey data, and so on. Every statistician knows the difficulty of using such data. For example, it should be verified that:

- the net enrolment rates or entry rates do not exceed 100%;
- these rates are consistent with the labour force participation rates of the same age groups;
- the figures on higher education expenditure provided by the ministry in charge of higher education match those provided by the ministry of finance or the department of statistics.

This work is extremely important, as it ensures the validity of all the data.

Two examples on how to verify the consistency of the results are shown below.

First example: entry rate into higher education

In the periodical *Education at a Glance* (2006 issue), the entry rate into higher education was illustrated as follows:

Table 6.1 Entry rate into higher education in selected OECD countries

Member country of the OECD	Entry rate into higher education 5A + 5B	Secondary school qualification 3A + 3B
Australia	70	70
Japan	75	69
Korea	94	66
New Zealand	140	75
United Kingdom	80	78

We can see that New Zealanders were very 'advanced' (in principle an entry rate cannot be higher than 100%), but the other countries in the table also experienced 'spontaneous generation' of students, since the entry rate into higher education was higher than the graduation rate from secondary school.

The problem lies in the definition of 'new entrants'. Should a person who has interrupted his or her education and, after having worked for a number of years, re-registers in university be considered a 'new entrant'? If our answer is 'yes', then a university having a number of continuing education programmes will likely have an entry rate exceeding 100%. It is therefore preferable to take into account only **first-time entrants** in higher education institutions.

Second example: Financial data – approved budget versus real expenditure

For financial data, the approved budget is often used because it is the most easily available and often the most recent data source. However, it can be very different from real expenditure, and the latter is available only with a one- or two-year time lag. This disparity can therefore give a false impression of real expenditure on higher education.

What do we do if the data do not match?

If we cannot match all the data, a possible solution is to calculate estimates. This requires having accurate statistics over a number of years. The other solution is to indicate the sources of the data clearly and explain why there are differences in the numbers. Remember that an indicator system is designed for non-statisticians. We therefore have to make the concepts underlying the data relatively easy to understand. It is important to show clearly that not everything can be communicated through statistics; this is the whole point of verifying consistency. It is by being transparent that we can attain the goal of clear communication.

We should repeat here that the data do not have to be perfectly accurate in order to be used. We can monitor trends in an education system and identify crucial problems (which is indeed the point of having an indicator system) even if we do not have infallible data.

6.3 Analyses of the indicators

This is an essential step in constructing a successful indicator system. Analyses of the indicators should be accessible to all intended readers of the publication presenting an indicator system – the general public, parliamentarians, stakeholders in universities, and so on – most of whom are not specialists in statistics and indicators. Presenting information in a simple, comprehensible way is not easy, particularly for statisticians. Even if the phenomena being illustrated are complex, we must find a way to present them in a simple manner without losing precision.

Some examples

Many widely disseminated indicator systems publications containing an analysis of the set of indicators are produced using a very similar structure: each indicator or group of indicators is presented in a two-page spread, with one page containing text and the other tables and figures.

This type of layout is very often used for general data on primary or secondary education. Examples include documents on schooling in Quebec (the first of their kind), the state of schools in France, and education in Algeria, Denmark, Lesotho, Mali, the Netherlands, Senegal, and other countries.

In the case of higher education, however, there are far fewer publications of this type. An example is the two-page presentation in *Appendix 3*, which is an excerpt from *The State of Higher Education and Research in France: 29 indicators*.

Some general principles

The **text** begins with a general analysis of an indicator, then specifically addresses its trend over time. Next, the most recent results are discussed in depth, followed by the breakdown of the indicator by category, for example the proportion by sex and region. The commentary should be plain and simple, succinct, and easy to understand by a non-specialist.

Too many **numbers** will detract from the readability of the text. Therefore, great care should be taken to ensure that they do not overwhelm the analysis, especially if they are already presented in a table or figure.

Tables and **figures** should be chosen with care and provide a maximum of information with a minimum of data. Depending on the indicator, they can show a time series, a breakdown of the indicator by category, and, if data are available, a distribution by region. The most common uses of figures are the following:

- line graphs to present trends,
- bar charts to present breakdowns of an indicator by sex or region,
- maps to indicate diversity or regional disparities.

In this type of document, we cannot systematically present all the data or even all the figures on certain data owing to lack of space. The choice of what to include must therefore be determined by the precision needed or a desire for greater readability. If we observe a weak trend in an indicator such as education expenditure as a proportion of GDP, we can present slight variations in its value in a table, but not in a graph because the trend will not be very apparent. In contrast, participation rates that have significantly increased are more visible in a graph than in a table.

Here the principle is to be flexible and always to look for the best way of communicating to a non-specialist.

Analysis and choice of an indicator

Analysis of a phenomenon may lead us to change our choice of indicator. For example, we want to study trends in the gender gap in higher education in a given country. The basic data are shown in *Table 6.2*.

Table 6.2 Analysis of female/male disparities: some traps

Academic year	Total student population	Males	Females	% female	Male GER	Female GER
1989–1990	301,218	208,634	92,584	30.7%	39.3%	16.7%
1990–1991	346,807	237,456	109,351	31.5%	44.5%	19.7%
1991–1992	359,406	246,156	113,250	31.5%	44.6%	19.7%
1992–1993	421,869	288,092	133,777	31.7%	51.1%	22.8%
1993–1994	471,792	317,654	154,138	32.7%	55.2%	25.7%

In observing the percentage of females, we come to the conclusion that the disparity has decreased. After conducting a more in-depth analysis, however, we become aware that both the gap between male and female student populations and the gap between male and female enrolment rates have increased. Therefore, we can conclude that disparities have increased, and to show this, it is preferable to choose one of the two gaps rather than simply the percentage of females. We can examine this table from another angle by calculating the ratio of males to females, or the reverse. We then see that this ratio decreased slightly, from 2.25 in 1989–1990 to 2.06 in 1993–1994. Hence, in relative terms, the female student population increased at a slightly faster rate than the male student population.

From the same basic data, it is therefore possible to create two indicators that give different and apparently contradictory impressions of the same reality. In fact, the contradiction is only apparent. The absolute gaps and relative growth are two sides of the same coin – they are complementary rather than contradictory.

Regardless of the analytical angle adopted, we note that the percentage of females, taken by itself, is not a good indicator of the trend in disparities. We must therefore be careful in choosing which indicator to calculate. Conducting an analysis can indeed lead us to redefine an indicator.

Choice of the type of figure

The visual presentation or layout of an indicator also plays an important role. By choosing a given type of graph or chart, or even by its layout, we can change the perception of a reader who is not used to judging such figures. By varying the length and width or the scale of a graph, we can accentuate or diminish the perception of trends or disparities. It is therefore very important to present information accurately in a graph in order to facilitate visual analysis and comprehension.

Figures 6.1 and *6.2* illustrate this. They are both based on *Table 6.3* and represent the gross enrolment rate in a developing country in a line graph for the period 1990 to 2004.

Table 6.3 Example of a trend in a gross enrolment rate

Year	1990	1992	1994	1996	1998	2000	2002	2004
GER	38	36	37.5	37	34	31	34	36

Figure 6.1 Gross enrolment rate from 1990 to 2004 (first visual representation)

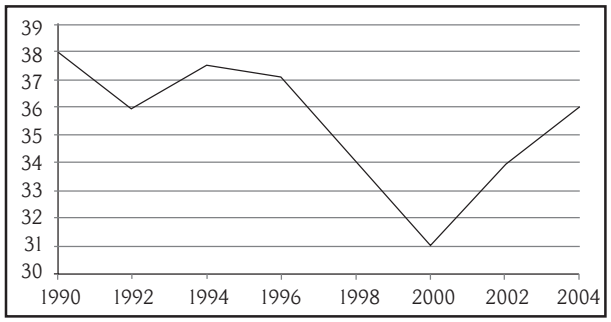
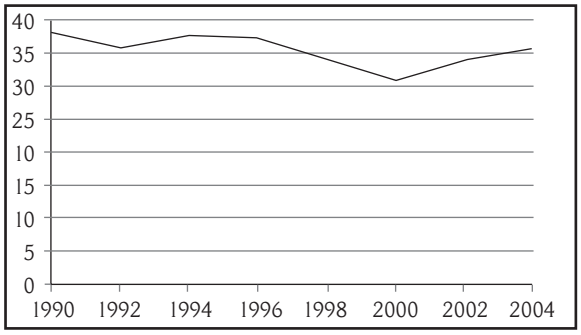


Figure 6.2 Gross enrolment rate from 1990 to 2004 (second visual representation)



Why, then, do these two graphs look so different? The differences are explained by two choices made by the designer. One is related to the length and width of the graph, and the other to the maximum and minimum values on the vertical axis.

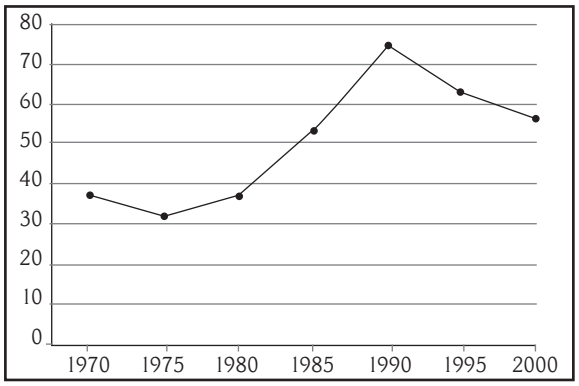
The result is clear. The second graph shows a fairly regular trend, the first a very substantial decrease between 1996 and 2000. In this specific case, it appears that the intention is to illustrate a recent problem, but this should be done in a less dramatic way than in the first graph, and in a more easily visible way than in the second. Here again, it is a matter of striking a balance between two extremes.

The time frame shown

The breakdown or time frame shown in a graph can also have an impact on the presentation of an indicator. *Figures 6.3*, *6.4*, and *6.5* illustrate this. They are based on the same data but cover different time frames:

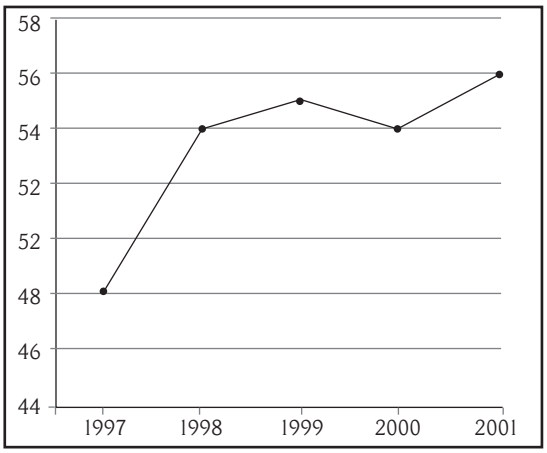
- *Figure 6.3* covers the period from 1970 to 2000 and presents the data from 1970, 1975, 1980, 1985, 1990, 1995, and 2000.

Figure 6.3 Enrolment rate from 1970 to 2000



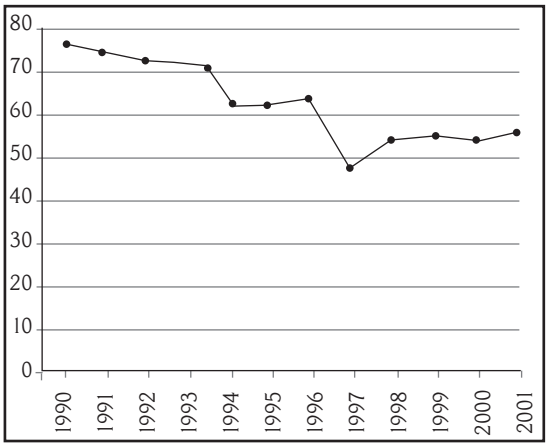
- *Figure 6.4* covers the period from 1997 to 2001 and presents annual data.

Figure 6.4 Enrolment rate from 1987 to 2001



- *Figure 6.5* presents annual data from 1990 to 2001.

Figure 6.5 Enrolment rate from 1990 to 2001



Here again, we can see to what degree the choice made – in this case the years shown – can affect

the analysis. *Figure 6.4* shows very positive results of regular growth. *Figure 6.5* is alarming because it shows a precipitous decrease with no recent recovery. *Figure 6.3* indicates that the recent fall in the rate had followed a rather strong upward trend from 1975 to 1990. The choice of graphs depends in part on the objective we want to monitor. In the example here, it is undoubtedly *Figure 6.3* that shows the most pertinent analysis: strong growth followed by an abrupt fall, then a slow decline over recent years. Obviously it would be very productive to look for explanations for these variations.

In summary, these examples illustrate the importance of the choices we make when communicating data in a graph.

Accompanying text

Terminology in the text should be clear and precise. We must 'educate' the reader by always using the correct term. This is very important in communication. If a graph is very complex, it should be accompanied by explanatory text that will help the reader understand it.

If, in covering the same phenomenon, data from various sources differ, it is indispensable for the credibility of the document to indicate this and give the reason in simple terms.

The success of the publication depends on the quality of the work carried out at this point. We must therefore use all possible means to mobilize all the competencies required for the project and endeavour to write relevant, short syntheses of the information we find. This means extracting essential ideas, without losing the nuances related to a system as complex as education. We should never underestimate the time needed to design and write the text presenting the indicator system – it is always a lengthy process.

Project manager

The project manager should play the role of editor-in-chief. He or she should set the editorial line and harmonize the writing and editing styles of the various writers involved. Excessive diversity of style is unacceptable in this type of document. The project manager should also verify whether the set of indicators presented is consistent – observation period, layout of tables and graphs, and so on. He or she ensures that the same symbols are used in all the graphs and charts, and should preferably lead the team of statisticians and/or analysts who will be writing the document after having been assigned certain indicators based on their competencies. Each writer should feel responsible for the quality of his or her indicator(s).

The work of the project manager is very important here. Given the magnitude of the task, the project manager can seek the help of someone who has considerable experience as an editor-in-chief.

Particularly in this area, training and the help of experts will often be necessary.

6.4 Designing the layout of the publication using computer programs

Layout

The layout of the publication presenting the indicator system is very important. We now rely on computer programs that make it easier to create the layout, which comprises text, tables, and figures (graphs and charts). It is important that the indicator be presented clearly so that the reader can rapidly perceive its meaning. For a general indicator system, we would recommend a two-page layout that presents all the components related to the same indicator (tables, figures, and analysis).

As soon as the tables and figures have been done, we must design the layout of the two-page or other model we have chosen. We can position the various components and verify whether the resulting composition is well balanced (see *Appendix 3*).

Software programs

For tables and figures, the easiest solution is to use a spreadsheet. The layout of text can be done using a word-processing program. Tables and figures can be imported or simply pasted into the word processor to do the final layout. These operations are very easy to do now on any type of computer.

We can also input data from a statistical database directly into other programs. For example, we can export data from a database into a spreadsheet. Since entering data need not be a very

time-consuming operation, however, one should not allot too much time to developing this export interface, which is not indispensable to the process. Your choice should be based on which operation (creating the interface or entering the data) will take you more time. It depends on the conditions in which you are working, but this should not delay the progress of work.

Publication and distribution

Various media formats can be used to disseminate an indicator system document: paper, website, and CD-ROM.

Problems can arise with the paper medium, as the document must pass through a graphic design chain that may involve certain technical processes. There are a number of technical problems to resolve that require considerable training of the staff responsible for preparing the document. It is possible to use a local publisher, but this raises the cost of the document for the ministry. In any event, a thorough analysis of local publishing costs should be conducted prior to any decision on the format of the document to be produced.

It is also important to publish the document quickly once it is ready. Throughout this guide we have stressed the need to produce a document containing the most recent data. It is therefore important not to spend too much time on producing and printing it. The time factor should also be taken into account in choosing the format of the publication.

6.5 Using the indicator system for internal and external evaluation: the importance of transparency

The publication of an indicator system is proof of a desire for transparency about the functioning of a higher education system or higher education institutions in a country or province. It also shows the efforts being made towards improvement through regular monitoring, evaluation, and verification. This is why the decision to publish is a matter of policy. It is therefore necessary to obtain the support and agreement of the ministry or department, as well as the principal, president, or director(s) of the institution. They are the ones who must validate the final document and, even better, will write a preface to it.

This is not always easy, but it is fundamental to the process. Policy-makers must be convinced of the need to distribute the information widely and to ensure that it is not simply shelved unread, which does indeed happen sometimes.

Once published, an indicator system document should be widely disseminated and be used to engage in the societal discussion about higher education and its institutions. It should therefore be available to politicians, higher education officials, students, parents' associations, professors and their unions and associations, principals and other heads of institutions, and administrative and technical staff of schools and other educational institutions.

The ultimate goal, ambitious but necessary for such a project, is to make this publication the go-to reference in policy discussions and the media.

Of course, the project will really be successful only if the publication of the indicator system is accompanied or followed by a transformation in the way decisions are made. A culture of objective data should develop and spread. Without such a transformation, the indicator system will lose its purpose and no doubt its utility. In the past, similar documents have appeared and then disappeared because they had little impact. The ball is in the policy-makers' court. The producers of the indicator system should do everything they can to show how useful it is and, as we have stated here a number of times, should construct it in such a way that it simply cannot be ignored.

6.6 Updating the indicator system or scorecard

The point is not to publish an indicator system or scorecard once and then stop after putting so much work into it. If it is to be useful and used, it should become part of the education landscape. There is only one solution: to publish it very regularly so that the most recent data are always available.

Depending on the resources at our disposal, we can choose to publish it annually, or every two or three years.

Therefore, we need to organize regular production of the indicator system document. This has an effect on the organization of the work, scheduling, data collection, and so on.

Computer programs make the updating of text, tables, and figures a relatively easy process. The data can be organized using the spreadsheet, and the same layout can be maintained from one edition of the publication to the next. As soon as new data are available, the computer files should be updated. We can obviously envisage using automated procedures, but they can sometimes be more of a burden than transferring or inputting data 'manually'. It is therefore necessary to analyse automated updating processes in depth before investing in them.

The ideal, of course, is quickly to begin publishing the indicator system on an annual basis. This should be the goal.

As previously indicated, the project manager should play the role of editor-in-chief in addition to his or her main role as project manager. So that indicator system production becomes routine, the process should be completely integrated into the ministry or institution concerned. However, the role of editor-in-chief remains essential. He or she is the guarantor of the quality and homogeneity of the document and should anticipate, be aware of, and avoid all pitfalls, particularly those related to the success of the first edition, which can result in requests for more information, more indicators, and so on.

Exercise 11

What problems do you think you will encounter in the steps we have just presented? How will you overcome them?

Exercise 12

What formats, media, and distribution can you envisage for your indicator system?

CHAPTER 7

HOW TO ORGANIZE AND MANAGE THE PRODUCTION OF AN INDICATOR SYSTEM

Having clearly defined the type of indicator system we desire and its intended audience, we must structure the work and define the project very precisely.

It is of prime importance to set a goal of publishing the document within a maximum time horizon of 18 months to two years. This is the best way of creating the incentive needed to accomplish the task within a reasonable time frame.

From the very beginning of the process, a project manager should be designated. He or she will develop a list of the most relevant indicators for the indicator system and will oversee the various human or material resources put in place or mobilized for the project. The project manager will have solid experience in statistics, a sound capacity for analysis of the education system or institution as a whole, and the ability to run this type of project from its conception to final publication.

This project should be integrated into existing organizational structures. Building the list of indicators should be the topic of high-level discussion among all the departments or sections involved, since these indicators should provide a means of monitoring progress towards the goals of government education policy or the strategy of an institution, by presenting an accurate picture of the current state of affairs and trends.

Therefore, it is often very useful in this process to establish a management or steering committee comprised of representatives from each of the departments or sections concerned. In the case of a government indicator system, the committee can be composed of people not only from the ministry or ministries directly responsible for education, but also from the ministries of employment, finance, planning, and so on.

Once this committee has defined the main themes and objectives to measure, a working group, comprising a small number of experts and led by the project manager, should execute the work. All aspects involved in the process should be covered.

To summarize, two groups are needed: a management or steering committee and a working group that will implement the project. This organizational structure, traditionally used in project management and operations, is indispensable. Deadlines should be clearly established on a strict schedule that governs the working group's development of the indicators and the management committee's policy validation process.

Between the start of the project and the publication of the first edition of the document, the time frame should be relatively short (no more than 18 months) in order to mobilize and maintain the energy and focus of those involved. The project should therefore be organized with this maximum duration in mind.

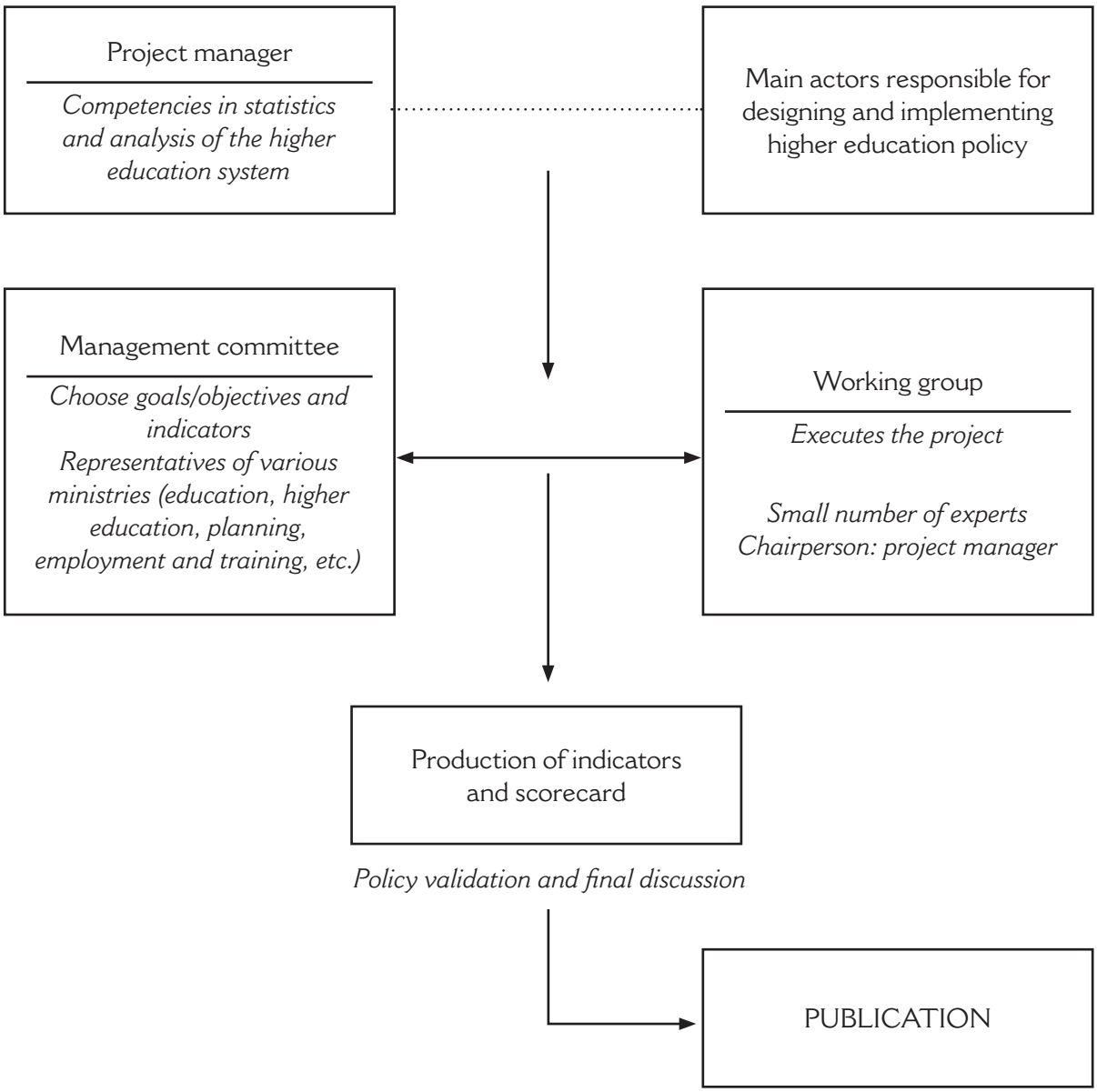
After two or three management committee meetings, the definitive list of indicators that will appear in the publication should be finalized. Only major unforeseen problems such as unavailability of data should interfere with the list validated by the management committee.

After validation, the management committee gets involved again in the final discussion about the document before its publication (this subject will be covered below). To ensure that the indicator system will last over the long term, it is paramount to involve the sections of the government ministries concerned. After the first edition is published, work should begin on preparing the second, which is absolutely essential for the project's continued success.

If indicator system production stops after the first edition, the project will have failed. Since it is the staff of established departments and sections who will be producing the document, they should be fully associated with the project structure, which should quickly disappear as production of the indicator system is incorporated into their regular work. Obviously, the editor-in-chief, who reports to the project manager, must remain. All of this should be clearly specified in advance.

Once the indicators have been defined and the necessary organizational structures created, the actual work can begin. *Figure 7.1* is an example of a combined organizational structure and workflow chart of the production of an indicator system.

Figure 7.1 Example of organizational structure and workflow chart



Exercise 13

How would you organize the indicator system project in your country, province, or institution? In particular, what constraints will you have to overcome?

Exercise 14

Develop an implementation plan to organize such a project in your country, province, or organization, specifying the steps involved, schedule, and allocation of responsibilities.

CHAPTER 8

USING INDICATORS FOR INTERNATIONAL COMPARISONS

International comparisons are increasingly being used in governments' analysis of their education systems. This is particularly true for higher education, where mobility, international exchanges, and competition are very pronounced. We have witnessed the very rapid development of sets of indicators and international rankings of universities.

Many national publications include international comparison indicators to provide information on the state of the country's education system compared to those of other countries. This is also the case for higher education institutions, which have included international indicators or their own international or national rankings in their own indicator systems.

It is therefore very important to have a clear idea of the strengths and weaknesses of international classifications (which are the basic tools of international comparison), international indicators, and rankings of higher education institutions.

In the same vein, it has become very important for higher education institutions to compare themselves to similar ones in other countries. It is therefore important to have in-depth knowledge of all the tools needed to make international comparisons (indicators and classifications).

8.1 International classifications and indicators in education

For more than 30 years, UNESCO has published comparative international statistics and indicators. It is in the past 20 years, however, that the importance of international comparisons has increased, particularly in higher education.

Based on the collection of common data, UNESCO, the OECD, and Eurostat have worked on producing indicators. The best known is the Indicators of Education Systems (INES) project of the OECD, which is responsible for the annual publication of *Education at a Glance*.

International Standard Classification of Education (ISCED)

The first step in international comparisons is to use a common nomenclature. In this case, we refer to the International Standard Classification of Education (ISCED) produced by UNESCO, the last revision of which dates from 1997.

In this latest version, still used today, we can distinguish three major categories of higher education programmes:

- long-duration higher education (below doctoral studies), coded as 5A;
- short-duration higher education, coded as 5B;
- doctoral studies, coded as 6.

The detailed description of each of these categories can be found in *Appendix 1*.

All indicators for international comparison are calculated using this nomenclature. The quality of the comparison obviously depends on how well the classifications are applied.

It should be noted that work is under way to improve and update the classifications, notably to reflect the bachelor's–master's–doctorate qualifications structure that is increasingly used worldwide. UIS should be presenting the revised sections at the UNESCO General Conference in 2011. Improvements made to the ISCED will benefit both institutions and countries, since the updated classifications will facilitate comparisons and provide greater accuracy in calculating progress towards achieving benchmarks.

Exercise 15

List the programmes in your country that are classified as ISCED 5A, 5B, and 6. What problems have you encountered in using these classifications?

Main indicators used in international comparisons

The main indicators can be found in publications of UNESCO, the OECD, and Eurostat.

Other than the indicators already mentioned, the European Union has defined five benchmarks to achieve by 2010:

1. no more than 10% early school leavers;
2. decrease of at least 20% in the proportion of pupils with low reading literacy proficiency;
3. at least 85% of young people should have completed upper secondary education;
4. increase in the number of graduates in mathematics, science and technology

(MST) by at least 15%, with a simultaneous decrease in gender imbalance;

5. 12.5% of the adult population should be participating in lifelong learning.

In 2008, the goal was attained for benchmark 4 (number of graduates in MST), but, at the time of writing, it was very unlikely that the other benchmarks would be achieved by 2010, whence the need to define new ones for the post-2010 period.

Therefore, the EU recently set the following benchmarks for 2020:

- At least 95% of children between the age of 4 and the age for starting compulsory primary education should participate in early childhood education.
- The share of 15-year-olds with insufficient abilities in reading, mathematics, and science should be less than 15%.
- The proportion of early leavers from education and training should be less than 10%.
- The proportion of 30- to 34-year-olds with tertiary educational attainment should be at least 40%.
- An average of at least 15% of adults (25–64 age group) should participate in lifelong learning.

Topics already covered in *Chapters 4* and *5* are re-examined here from the perspective of international comparisons. The formulas for calculating the indicators below are presented in *Appendix 5*.

The main indicators used for international comparisons of **expenditures** are:

- domestic expenditure on higher education as a percentage of GDP;
- the proportion of higher education expenditure in total public expenditure;
- average expenditure per student in higher education;
- cumulative expenditure per student over the average duration of higher education;
- the relative shares of public and private expenditure on higher education.

The comparability problems with these indicators derive from the various types of financial aid given to students, which may or may not be included in expenditures, and the way in which expenditure on research is treated in government accounts, which can vary from one country or jurisdiction to another.

Certain types of direct or indirect financial aid to students or their families are not included in the accounts of expenditures on higher education. Some are tax-related, such as tax credits for tuition fees or other education-related expenses (for example, for families with students under a certain age), and some are directly linked to the status of being a student (for example, social housing allowances and other student aid). International comparison of government aid to students is a sensitive topic, since higher education expenditures on the part of students and their families vary considerably from one country to another.

The main indicators in measuring the activities of higher education institutions are the following:

- entry rate into higher education, distinguishing between 5A and 5B;
- breakdown of new entrants into higher education by age;
- gross enrolment rate in higher education;
- graduation rate for the PhD level;
- graduation rates for 5A qualifications;
- graduation rates for 5B qualifications;
- graduation rates for science qualifications;
- education expectancy in higher education;
- proportion of higher education graduates in the 25–34 age group;
- comparison of proportions of higher education graduates in the 25–34, 25–64, and 55–64 age groups.

Despite the considerable progress made in the methodology of international comparisons in the past decade, some major problems remain to be solved in order to obtain totally accurate comparisons:

- entry rate into higher education (covered in *Chapter 5*);
- success rate (inappropriately called the 'survival rate') in higher education. To talk about success in higher education, we need to know how many students who began their studies (new entrants) subsequently graduated with a qualification. It is not very important whether the qualification they obtained came after a change of discipline or programme, because they still graduated and did not fail in or drop out of the initial programme, but rather left it for another.

What is important, then, is that they will not be counted as having failed or dropped out. Up to the time of writing, the data provided measured only 5A programmes. However, many students change from a 5A to a 5B programme while pursuing their education, and obtain their qualification in the latter type of programme. Therefore, it is incorrect to record this as a failure. To shed light on this phenomenon, follow-up surveys have been conducted, and the magnitude of such changes and their effect on success rates has been observed (see *Table 8.1*). We must now put this knowledge into practice to improve the comparability of this indicator;

- graduation rate for a first qualification in higher education. The issue here is clearly to identify the first degree or diploma and not to count it twice. For example, a student switching from a 5B to a 5A programme can be easily counted twice. Work is under way to improve this indicator.

Table 8.1 Success (survival) rates in higher education in France based on individual student data (2004)

Entrants in:	Total	Tertiary graduates Type A	Tertiary graduates Type B	All tertiary graduates	Leavers without a tertiary degree
Tertiary type A	100	64.3	14.5	78.8	21.2
Tertiary type B	100	1.6	77.6	79.2	20.8
All higher education	100	38.5	40.5	79.0	21.0

Explanation of Table 8.1: Out of 100 students who began university studies (5A), 64 obtained a degree at least equivalent to a Bachelor's (*licence*), 15 changed to a 5B programme (IUT, STS, and so forth) and obtained a diploma, and 21 left without obtaining a higher education degree or diploma.

Discussions on changes to ISCED 1997 also include improving the comparability of these indicators. It is important to remember that not all comparability problems have been resolved and that considerable work remains to be done to arrive at truly valid comparisons.

The proportion of foreign students in higher education (or inbound mobility rate) is the main indicator that **measures the attractiveness of a higher education system.** The main problem is distinguishing resident foreign students from those who have come just to pursue their studies. The criterion used is where the secondary school diploma allowing entry into higher education was obtained. If it was obtained in the country where the student is in higher education, then the student is considered a resident of that country; if not, then the student came specifically to that country to pursue studies in higher education and will likely return to his or her country of origin (and is therefore a *bona fide* foreign student). It is not yet possible to make this distinction for all countries, so work is under way in this regard as well.

The main indicators used to measure **external efficiency** are:

- the employment rate of higher education graduates;
- the unemployment rate of higher education graduates;
- the proportion of higher education graduates holding a job as a percentage of people 25–64 years of age;
- wages and salaries of higher education graduates;
- relative earnings from employment of higher education graduates.

Problems with these indicators are related to their sources, which are government labour force surveys or tracer studies on higher education graduates or leavers. The recommendation here is that labour force surveys should include questions that reveal information on the labour force by educational attainment, age, and date of leaving the higher education institution. Another possibility is to conduct systematic surveys of all higher education leavers. These could be conducted very quickly following their departure from higher education, or three, five, or seven years later, as is done by CEREQ in France and HESA in the UK.

8.2 Country rankings

Rankings have existed for some time, but in the past their geographic coverage was often limited to the country level.

The Carnegie Classification of Institutions of Higher Education appeared for the first time in 1973. It covered colleges and universities in the United States. Other US rankings followed, notably the ranking of universities published in 1983 by *U.S. News & World Report* and annually since then.

Daily, weekly, and monthly publications in France and other countries have regularly published rankings of certain categories of higher education institutions since 1990 – *grand écoles*, business and management schools, and so on – using a wide variety of criteria and methods.

In the UK, the *Times* and *Guardian* regularly publish rankings of higher education institutions. Australia, with *The Good Universities Guide*, and Canada, with *Maclean's* magazine's rankings of universities, have also published rankings of their respective countries' higher education institutions for many years.

More than 20 national, transnational, and international rankings exist worldwide. Examples cited here (*Table 8.2*) are from Germany, Australia, Canada, the USA, Poland, and the UK. According to Van Dyke (2005), the goal is certainly to salute excellence, but these rankings are most often used to help secondary school graduates choose where to study and provide a rationale for their choice.

Table 8.2 Selected examples of rankings of higher education institutions (2002)

Publisher	Title	Country/region	Goal
Asiaweek	Asia's Best Universities	Asia	Honour excellence
The Centre for Measuring University Performance	The Top American Research Universities	USA	List the best universities for research
CHE/Stern	CHE/Stern University Ranking	Germany	Help secondary school graduates choose where to study
Good Universities Guide	The Good Universities Guide	Australia	Help secondary school graduates choose where to study
The Guardian	University Guide	UK	Help secondary school graduates choose where to study
Maclean's	Annual University Rankings	Canada	Help secondary school graduates choose where to study
Melbourne Institute	Index of the International Standing of Australian Public Universities	Australia	International ranking of Australian universities
Perspektyw	University Rankings	Poland	Help secondary school graduates choose where to study
The Times	Times Good University Guide	UK	Help secondary school graduates choose where to study (focus on teaching quality rather than research)
U.S. News and World Report	Best Colleges	USA	Help secondary school graduates choose where to study

The example of Côte d'Ivoire

In Côte d'Ivoire, the ranking of institutions has been an initiative of the Ministry of Higher Education and Scientific Research. The goal is to make available to students and their parents a list of credible private institutions, which account for a large share of higher education in the country. Indeed, the government allocates 25 million CFA francs to students in private institutions.

According to the Ministry of Higher Education and Scientific Research, the essential goal of the ranking is to instil new energy and healthy competition among private higher education institutions.

The ranking covers such criteria as infrastructure and environment, equipment, education management, internal and external performance, social assistance costs, and tax burden. The jury

is composed of representatives from the *Union générale des entreprises de Côte d'Ivoire* and the *Confédération générale des entreprises de Côte d'Ivoire* (national business associations), founders' associations, officials from public and private universities, and so on.

Exercise 16

Are there national rankings of universities in your country? If not, do you think it would be productive to establish one? If yes, who should do it? Who would use it?

8.3 International rankings

The first world ranking of universities was developed in 2003 by Shanghai Jiao Tong University. The first international meeting on the theme of ranking higher education institutions was held in 2002 in Warsaw. The first edition of the 'Shanghai Ranking' in 2003 was greeted by scepticism and condescendence on the part of the university community. A year later, however, the *Times Higher Education Supplement* produced a similar ranking, based on certain quantifiable criteria.

Almost immediately, objections were made to these rankings. Some focused on the methodology, and in particular the reductionist effect of world rankings based on quantitative indicators aimed at discerning the quality of institutions that are in reality highly complex. Other objections related to the purpose of the rankings: immediate use for potential students and their choices, or establishing distinctions among institutions (which in turn reflect different education systems around the world). Still others questioned the accuracy and reliability of rankings. Indeed, the changes in the rankings from one year to the next are surprising, since the quality of a university cannot deteriorate or improve substantially in such a short period of time.

Since the early 2000s, these rankings have become tools for discussion and evaluation that cannot be ignored. It is clear that despite the obstacles, they are here to stay, regardless of whether they are approved of by universities and other organizations.

Whatever one may think and feel about these rankings, they play an increasingly important role today in the image of a university and hence its attractiveness, credibility, and capacity to obtain funding from governments as well as multinational and international organizations.

The goal today is to improve methodologies by respecting a number of 'good practice' rules. The Shanghai Ranking has evolved because its designers have taken into account the criticisms levelled at it. Therefore, for the first time since 2007 and from now on, their method will focus on five major areas.

The multiplicity of methodological problems posed by rankings spurred UNESCO's European Centre for Higher Education (CEPES) and the Institute for Higher Education Policy (IHEP) in Washington to create the International Ranking Expert Group (IREG) in 2004. The IREG produced a number of principles on quality and best practices, known as the Berlin Principles on Ranking of Higher Education Institutions. These principles were adopted in May 2006 and articulate 16 standards (see *Appendix 6*).

These 16 principles on rankings can be summarized in four main recommendations:

- Recognize the diversity of institutions and take into account their different missions and goals.
- Use a clear and transparent methodology.
- Measure outputs and outcomes in preference to inputs, and use audited, verifiable, and comparable statistical data.
- Provide 'consumers' with a clear understanding of all the factors used to develop a ranking, and offer them a choice in how rankings are displayed.

Observation of these principles should go hand in hand with the accuracy of the data used in the ranking process.

Methods for defining quality – criteria and indicators used

Approaches to ranking are very different in terms of the methods used to choose the institutions and then to rank them, and in terms of the **measurement methods** and the **format used to present the results.**

The **first step** in all ranking systems consists in choosing what type of unit will be ranked: universities, other institutions, faculties, departments, groupings of disciplines in the same location, and so on. There is a wide range to

choose from, but this choice is important because it will affect all the rest of the work.

The **second step** consists in establishing the list of higher education institutions to which the ranking criteria will be applied. This stage is very important, because it determines the list of units that will appear in the final rankings.

The *Times Higher Education Supplement*, for example, established its list for the 2007 ranking by asking each of 5,101 experts, whose email addresses were listed in the Quacquarelli Symonds (QS) database,[11] to designate 30 institutions other than their own that they considered to be excellent in their fields.

The Centre for Science and Technology Studies (CWTS) at Leiden University has developed a ranking system based solely on bibliometric indicators. It is applied to European universities covered by these indicators.

It should also be noted that a project for Africa is in its development phase. The project, which seems quite robust, is entitled the African Higher Education Quality Rating System. It was established at the request of the Conference of Ministers of Education of the African Union (COMEDAF) and should be fully implemented by 2011 (African Union, 2007).

Reacting to the growing importance ascribed to some of the aforementioned rankings, various institutions have produced their own rankings. However, these are often based on a very small number of criteria so as indicate the institution's high ranking within this framework of few criteria. They obviously are not in conformity with the good practices recommended in the IREG's Berlin Principles in 2006 (*Appendix 6*).

The **third step** is the choice of criteria directly related to the objectives of the project, followed by the actual process of ranking.

The Shanghai Ranking mainly focuses on criteria related to research. Indicators include the number of Nobel Prize and Fields Medal winners, the percentage of most frequently cited researchers, and the percentage of papers indexed in the Science Citation Index Expanded (SCIE) and the Social Science Citation Index (SSCI). Two new indicators have been introduced: the percentage of papers published in the best professional journals (20% for each subject area) and the budget allotted for research.

In Germany, the CHE Excellence Ranking is more complex. It uses much more data, some to rank institutions, others to inform students. Only biology, mathematics, chemistry, and physics are covered in this ranking system.

The Webometrics Ranking of World Universities[12] analyses approximately 17,000 higher education institutions and ranks the top 6,000. It uses four main indicators: size of the website (number of pages), visibility (number of unique external links received using Yahoo Search), the number of 'rich files' (files in certain designated formats) online, and the number of papers and citations for each academic domain (using Google Scholar). This system provides a ranking of all universities worldwide by the image they present on the web. We can therefore find rankings of African universities, for example.

Although the authors of the Webometrics Ranking claim they adhere to the Berlin Principles, caution must be exercised in analysing these rankings, because their coverage is limited to how universities appear on the Internet.

For more details on the criteria used in these rankings, two documents that analyse them can be consulted (Dalsheimer and Despreaux, 2008; Dalsheimer and Sauvageot, 2008).

Conclusions about international classifications and rankings

In the span of a few years, rankings of higher education institutions have developed at lightning speed, indisputable proof that they are responding to a need, namely providing market transparency and measuring the quality of higher education and research.

Given the expectations related to this need, it seems important to understand the foundations of such rankings. First of all, it is fundamental to indicate that there are many kinds of excellence that can be attributed to a higher education institution. Not all institutions have the same goals and provide the same functions within the broad

11. Quacquarelli Symonds is a company that specializes in information on higher education and opportunities to study abroad. QS has offices in London, Paris, Beijing, Singapore, Sydney, Tokyo, and Washington. It builds databases on professors and researchers in research universities worldwide.

12. www.webometrics.info/index.html

range of responsibilities that constitutes higher education as a whole.

A higher education institution may very well have a goal of regional development based on short-term programmes and intend to be excellent in this field. Another may target world-class excellence in mathematics or biology research. There is no point in ranking these two institutions on the same scale and in the same list.

Therefore, both ranking and evaluation should be based on a typology of higher education. The difficulty lies in constructing such a typology and obtaining minimal agreement among the institutions concerned.

It is also imperative to develop an all-encompassing project that covers all higher education institutions by taking into account the diversity of their goals and functions. In view of the complexity of this process, it is probable that such a typology will not be partitioned in the mathematical sense of the term and that an institution can belong to many groups.

The typology must be accompanied by a set of descriptive variables offering a great deal of flexibility in terms of the various rankings that can be deduced from them and making the typology useable by many types of 'consumers' – students, counselling staff, evaluators – through a variety of approaches. This is absolutely necessary for the credibility of the project, just as it is necessary to follow the Berlin Principles in constructing the ranking. This will limit the confusion and controversy that often reign today, as for example when a ranking in research is used to rank teaching.

We can observe that current rankings have met a recognized need to improve the cohesion of the teaching and research offered by institutions. This has resulted in mergers of certain universities. In France, Strasbourg's three universities have recently merged into one. There are other examples of this emerging trend, such as Zurich, London, Salford, and Manchester. The complexity of the merger of institutions and the energy needed to integrate their administration are also being measured.

Moreover, there is no reason for rankings to apply solely to a university as a whole. The entity to be ranked can, for example, be a particular location with a variety of offerings in a given field, regardless of which institutions teach this field. Thus, a number of chemistry or physics departments dispersed in various institutions such as universities and schools but located in the same city could be grouped together and comprise one entity or unit to be evaluated. This may require significant scouting and researching of the locations, as well as the willingness of these departments to be grouped together, but overall this seems to be a promising approach.

It is therefore necessary to take advantage of the current momentum in ranking to build a quality assessment tool for higher education. Giving some thought to the nature of ranking can be a strong lever in improving quality.

With regard to countries in Africa, it would be very productive to develop a ranking system that takes into account the specific characteristics of their institutions, helps to ensure quality in higher education, and responds to African countries' strategy of harmonization of higher education. As previously indicated, a project is well under way to establishing such a rating system, led by the African Union. Its implementation throughout Africa should be accomplished by 2011.

Exercise 17

What do you think of international classifications and rankings of institutions of higher education? Do they apply to the context of your country? If not, what can be done to adapt them to this context?

Conclusion

Faced with an ever-increasing student population, higher education is undergoing radical transition in many countries. Significant reforms have been implemented to address new challenges, including the management of the sector. In exchange for greater autonomy, governments are demanding strategic planning and *a posteriori* demonstrations of performance. In this context, indicator systems on higher education and its institutions have become indispensable management tools.

However, we must reiterate a concern previously expressed here: it is not possible to construct a worthwhile indicator system without accurate and regular data on higher education, and the situation in this respect is worrisome in many countries. It is also impossible to develop an indicator system without conducting significant preparatory work on and in higher education information systems.

The shortage of regular statistics on higher education in many countries is a major obstacle to progress in this rapidly changing sector. If higher education systems want to develop and to play a role in the globalization process, it is imperative that they improve their management practices, operations, and performance. To do so, they need to have indicator systems and a means of comparison with other systems. This is therefore a vital issue for the development of higher education systems and institutions, both of which should have all the tools needed to meet this challenge.

Indicator systems are also very important tools for informing strategic reflection on higher education. The development of the higher education sector is an essential component in a country's development because it produces the human resources and knowledge that allow the country to join the new world order that has emerged as the result of globalization. Regular production of high-quality indicator systems with accurate data is therefore of the utmost importance.

This guide has attempted to present a complete panorama of the components making up an indicator system and to illustrate the valuable contribution an indicator system can make to this education sector, which is so crucial to the future of developing countries.

References

African Union. 2007. 'Developing an African higher education quality rating system'. Report submitted to the Meeting of the Bureau of COMEDAF II+, May. Addis Ababa. Available at: www.africa-union.org

Cave, M.; Hanney, S.; Kogan, M. 1997. *The use of performance indicators in higher education*. 3rd edition. Higher Education Policy Series 3. London and Bristol: Jessica Kingsley Publishers.

Conlon, M. 2004. 'Performance indicators: Accountable to whom?' In: *Higher Education Management and Policy, 16*(1), 41–48.

Dalsheimer, N.; Despreaux, D. 2008. 'Les classements internationaux des établissements d'enseignement supérieur.' In: *Éducation & Formation*, No. 78 (November), pp. 151–173. DEPP, ministère de l'Éducation nationale and ministère de l'Enseignement supérieur et de la Recherche, France.

Dalsheimer, N.; Sauvageot, C. 2008. *Les classements internationaux des établissements d'enseignement supérieur*. Internal memorandum. DEPP, ministère de l'Éducation nationale and ministère de l'Enseignement supérieur et de la Recherche, France. March.

Dias da Graça, P.; Sauvageot, C. 2005. *Using indicators in planning education for rural people in Africa: A practical guide*. Paris: IIEP-UNESCO.

European Commission. 2007. *A coherent framework of indicators and benchmarks for monitoring progress towards the Lisbon objectives*. Brussels: European Commission. http://eur-lex.europa.eu/LexUriServ/site/en/com/2007/com2007_0061en01.pdf

European Union (EU). 2005, 2006 and 2007. *Lisbon Strategy: Annual progress reports*.

Eurydice. 2007. *Key data on higher education in Europe 2007*. Brussels: Eurydice.

Fielden, J.; Abercromby, K. 2001. *Accountability and international co-operation in the renewal of higher education*. UNESCO Higher Education Indicators Study.

France. Ministry of Education. 2007. *The state of higher education and research in France: 29 indicators*. No. 1 (November). Paris: Ministry of Education, Evaluation, Forecasting, and Performance Directorate (English version).

HEFCE (Higher Education Funding Council for England). 1999. *Performance indicators in higher education in the UK*. London: HEFCE Report 99/66.

IREG (International Ranking Expert Group). 2006. www.ireg-observatory.org

Johnstone, J.N. 1981. *Indicators of education systems*. London: Kogan Page and UNESCO.

Kaplan, R.S.; Norton, D.P. 1992. 'The balanced scorecard: Measures that drive performance'. In: *Harvard Business Review*, January-February, 71–79.

———. 1996. *The balanced scorecard: Translating strategy into action*, Cambridge, Mass.: Harvard Business School Press.

Levin, H.M. 1983. *Cost-effectiveness: A primer*. Beverly Hills: Sage Publications.

Martin, M.; Stella, A. 2007. *External quality assurance in higher education: Making choices*. Fundamentals of educational planning, No. 85. Paris: IIEP-UNESCO.

Mauritius, Tertiary Education Commission. 2007. *Strategic plan 2007–2011*. Port Louis: TEC.

Organisation for Economic Co-operation and Development (OECD). 2006. *Education at a glance: OECD indicators 2006*. Paris: OECD.

———. 2006. *Education policy analysis: Focus on higher education 2005–2006*. Paris: OECD.

Sachs-Israel, M.; Connal, C.; Sauvageot, C. 2007. *NFE-MIS handbook: Developing a sub-national non-formal education management information system*. Paris: UNESCO.

Sanyal, B.C.; Martin, M. 2007. 'Financing higher education: International perspectives'. In: *Financing higher education in the world*. GUNI Series on the Social Commitment of Universities, No. 1, pp. 3–19. New York: Palgrave.

———. 1995. *Innovations in university management*. Paris: IIEP-UNESCO.

Sauvageot, C. 2003. *Indicators for educational planning: A practical guide*. 2nd edition. Paris: IIEP-UNESCO.

———. 2007. *Manuel de développement d'indicateurs sur l'enseignement technique et la formation professionnelle. Notes méthodologiques*. Turin: Fondation européenne pour la formation.

South Africa, Department of Education. 1997. *Education white paper 3: A programme for the transformation of higher education*. Government of South Africa, July.

South Africa, Ministry of Education. 2001. *National plan for higher education in South Africa*. February.

UIS (UNESCO Institute for Statistics). 2009. *Global education digest 2009: Comparing education statistics across the world*. Montreal: UNESCO Institute for Statistics.

UK Department for Education and Skills. 2003. *The future of higher education*. Presented to Parliament by the Secretary of State for Education and Skills by Command of Her Majesty. January.

UNESCO. 1997. *International Standard Classification of Education (ISCED) 1997*. Paris: UNESCO.

Van Dyke, N. 2005. 'Twenty years of university report cards'. In: *Higher Education in Europe 30*(2), 103–125.

Windham, D.M. 1988. *Improving the efficiency of educational systems: Indicators of educational effectiveness and efficiency*. Tallahassee: Florida State University.

Websites:

Berlin Principles
www.che.de/downloads/Berlin_Principles_IREG_534.pdf

European Union. Education and Training policy
http://ec.europa.eu/education/

University of Edinburgh. Government and Strategic Planning
www.planning.ed.ac.uk/Strategic_Planning/BSC/Overview.htm

Universiti Teknologi Malaysia. Strategic Planning
www.utm.my/aboututm/

UK Higher Education Statistics Agency. Performance indicators in higher education
www.hesa.ac.uk/index.php/content/category/2/32/141

Webometrics. Ranking of World Universities
www.webometrics.info/

Appendix 1

ISCED – Levels 5A and 5B (excerpt from ISCED 1997, UNESCO)*

LEVEL 5 – FIRST STAGE OF TERTIARY EDUCATION (NOT LEADING DIRECTLY TO AN ADVANCED RESEARCH QUALIFICATION)

Principal characteristics

80. This level consists of tertiary programmes having an educational content more advanced than those offered at levels 3 and 4. Entry to these programmes normally requires the successful completion of ISCED level 3A or 3B or a similar qualification at ISCED level 4A.

81. All degrees and qualifications are cross-classified by type of programmes, position in national degree or qualification structures (see below) and cumulative duration at tertiary.

Classification criteria

82. For the definition of this level, the following criteria are relevant:

- Normally the minimum entrance requirement to this level is the successful completion of ISCED level 3A or 3B or ISCED level 4A.
- Level 5 programmes do not lead directly to the award of an advanced research qualification (level 6).
- These programmes must have a cumulative theoretical duration of at least 2 years from the beginning of level 5.

Complementary dimensions

83. Three complementary dimensions are needed to subdivide this level:

- the type of programmes dividing programmes into theoretically based/research preparatory/ giving access to professions with high skills requirements programmes on the one hand, practical/technical/occupationally specific programmes on the other hand;
- the cumulative theoretical duration in full-time equivalence;
- the position in the national degree or qualification structure (first, second or further degree, research).

Combining these three independent dimensions is the only way to capture the broad variety in the provision of tertiary education. The choice of the combination depends on the problems to analyse.

Type of programmes

84. The first dimension to be considered is the distinction between the programmes which are theoretically based/research preparatory (history, philosophy, mathematics, etc.) or giving access to professions with high skills requirements (e.g. medicine, dentistry, architecture, etc.), and those programmes which are practical/technical/occupationally specific. To facilitate the presentation, the first type will be called 5A, the second, 5B.

85. With the increasing demand for tertiary education in many countries, the distinction between long streams and short streams is very important. The long stream programmes are more theoretical and can lead to advanced research programmes or a profession with high skills requirements. The short streams are more practically oriented.

86. As the organizational structure of tertiary education programmes varies greatly across countries, no single criterion can be used to define boundaries between ISCED 5A and ISCED 5B. The following criteria are the

* *Source:* UNESCO, 1997.

minimum requirements for classifying a programme as ISCED 5A, although programmes not satisfying a single criterion should not be automatically excluded. If a programme is similar in content to other programmes meeting each of these criteria, it should be classified at level 5A.

87. ISCED level 5A programmes are tertiary programmes that are largely theoretically based and are intended to provide sufficient qualifications for gaining entry into advanced research programmes and professions with high skills requirements. They must satisfy a sufficient number of the following criteria:

- They have a minimum cumulative theoretical duration (at tertiary) of three years' full-time equivalent, although typically they are of 4 or more years. If a degree has 3 years' full-time equivalent duration, it is usually preceded by at least 13 years of previous schooling (see paragraph 35). For systems in which degrees are awarded by credit accumulation, a comparable amount of time and intensity would be required.
- They typically require that the faculty have advanced research credentials.
- They may involve completion of a research project or thesis.
- They provide the level of education required for entry into a profession with high skills requirements (see paragraph 84) or an advanced research programme.

88. Qualifications in category 5B are typically shorter than those in 5A and focus on occupationally specific skills geared for entry into the labour market, although some theoretical foundations may be covered in the respective programme.

89. The content of ISCED level 5B programmes is practically oriented/occupationally specific and is mainly designed for participants to acquire the practical skills, and know-how needed for employment in a particular occupation or trade or class of occupations or trades – the successful completion of which usually provides the participants with a labour-market relevant qualification.

90. A programme should be considered as belonging to level 5B if it meets the following criteria:

- It is more practically oriented and occupationally specific than programmes at ISCED 5A, and does not provide direct access to advanced research programmes.
- It has a minimum of two years' full-time equivalent duration but generally is of 2 or 3 years. For systems in which qualifications are awarded by credit accumulation, a comparable amount of time and intensity would be required.
- The entry requirement may require the mastery of specific subject areas at ISCED 3B or 4A.
- It provides access to an occupation.

Cumulative theoretical duration

91. For initial programmes at tertiary, the cumulative theoretical duration is simply the theoretical full-time equivalent duration of those programmes from the beginning of level 5.

92. For programmes that require completion of other tertiary programmes prior to admission (see national degree and qualification structure below), cumulative duration is calculated by adding the minimum entrance requirements of the programme (i.e. full-time equivalent years of tertiary education prerequisites) to the full-time equivalent duration of the programme. For degrees or qualifications where the full-time equivalent years of schooling is unknown (i.e. courses of study designed explicitly for flexible or part-time study), cumulative duration is calculated based on the duration of more traditional degree or qualification programmes with a similar level of educational content.

93. The categories to be considered would be:

- 2 and less than 3 years (particularly for ISCED level 5B),
- 3 and less than 4 years,
- 4 and less than 5 years,
- 5 and less than 6 years,
- 6 years and more.

National degree and qualification structure

94. This dimension cross-classifies both ISCED 5A and 5B qualifications by their position in the national qualification structure for tertiary education within an individual country.

95. The main reason the national degree and qualification structure is included as a separate dimension is that the timing of these awards mark important educational and labour market transition points within countries. For example, in country A a student who completes a three year Bachelor's degree programme will have access to a wide range of occupations and opportunities for further education, whereas the same student studying in country B (which does not distinguish between a first and second university degree) will only obtain a labour market relevant qualification after the completion of a full four- or five-year degree programme, even though the content may be similar to that of a second (Master's) degree programme in country A.

96. The 'position' of a degree or qualification structure is assigned (first, second or further, research) based on the internal hierarchy of awards within national education systems. For example, a first theoretically based degree or qualification (cross-classifying 'theoretically based' type of programme 5A with 'first' in the national degree and qualifications structure) would necessarily meet all of the criteria listed above for a theoretically based programme and lead to the first important educational or labour market qualification within this type of programme. The research degree is intended for the countries which have a non-doctoral research degree such as the Master of Philosophy in some countries and want to have it clearly distinguished in international statistics.

97. When 'theoretically based' programmes are organized and provide sequential qualifications, usually only the last qualification gives direct access to level 6, but all these programmes are allocated to level 5A.

98. Bachelor's degrees in many English-speaking countries, the *Diplom* in many German-speaking countries, and the *Licence* in many French-speaking countries meet the content criteria for the first theoretically based programmes. Second and higher theoretically based programmes (e.g. Master's degree in English-speaking countries and *Maîtrise* in French-speaking countries) would be classified separately from advanced research qualifications, which would have their own position in ISCED 6 (see below).

99. Degrees or qualifications with a different numerical ranking in two countries may be equivalent in educational content. For instance, programmes leading to a 'graduate' or second degree in many English-speaking countries have to be classified at level 5 as is the case for long first degrees in many German-speaking countries. It is only by combining national degree structures with other tertiary dimensions, such as cumulative theoretical duration and programme orientation, that enough information is available to group degrees and qualifications of similar education content.

Table A1. How the three complementary dimensions work at level 5 of the ISCED

Theoretical cumulative duration at tertiary level	LEVEL 5				
	5A Programmes			5B Programmes	
	First degree	Second and further degree	Research	First qualification	Second qualification
2 and < 3 years					
3 and < 4 years					
4 and < 5 years					
5 and < 6 years					
6 years and +					

Includes also:

100. This level includes all the research programmes which are not part of a doctorate, such as any type of Master's degree.

101. In some countries, students beginning tertiary education enrol directly for an advanced research qualification. In this case, the part of the programme concentrating on advanced research should be classified as level 6 and the initial years as level 5.

102. Adult education programmes equivalent in content with some ISCED 5 programmes could be included at this level.

LEVEL 6 – SECOND STAGE OF TERTIARY EDUCATION (LEADING TO AN ADVANCED RESEARCH QUALIFICATION)

Principal characteristics

103. This level is reserved for tertiary programmes which lead to the award of an advanced research qualification. The programmes are therefore devoted to advanced study and original research and are not based on course work only.

Classification criteria

104. For the definition of this level, the following criteria are relevant:

Main criterion

It typically requires the submission of a thesis or dissertation of publishable quality which is the product of original research and represents a significant contribution to knowledge.

Subsidiary criterion

It prepares graduates for faculty posts in institutions offering ISCED 5A programmes, as well as research posts in government, industry, etc.

Complementary dimensions

105. As the scope of this level is very restricted, no complementary dimension is needed.

Includes also:

106. The part concentrating on advanced research in those countries where students beginning tertiary education enrol directly for an advanced research programme (see paragraph 101).

Appendix 2

List of the 29 indicators established by the European Union in 2004*

Improve the quality of teachers and trainers:

1. Age of teachers (% of teachers aged over 50 by primary, secondary)
2. Number of young people (proportion of people under 20 years of age in the total population)
3. Ratio of pupils to teaching staff

Develop skills for the knowledge society:

4. Completion of upper secondary education
5. Percentage of students with low reading literacy proficiency (PISA) (by sex)
6. Performance in reading of 15-year-olds (PISA) (by sex)
7. Performance in mathematics of 15-year-olds (PISA) (by sex)
8. Performance in science of 15-year-olds (PISA) (by sex)
9. Participation in education and training of initially low-qualified people

Increase recruitment in science and technical studies:

10. Students enrolled in MST as a proportion of all students
11. Graduates in MST as a percentage of all graduates
12. Total number of tertiary MST graduates (growth)
13. Number of graduates in MST per 1,000 inhabitants

Make better use of resources:

14. Public expenditure on education
15. Private expenditure on educational institutions
16. Enterprise expenditure on continuing vocational training
17. Total expenditure on educational institutions per pupil
18. Total expenditure on educational institutions per pupil, compared to GDP per capita

Develop an open environment for lifelong learning:

19. Participation in lifelong learning, population 25–64 years of age, all, and those with a low level of education (by sex)

Make education and training attractive:

20. Participation in continuing vocational training, all enterprises
21. Participation in continuing vocational training, training enterprises
22. Participation rates in education in the population 15–24 years of age
23. Share of early school leavers in the population 18–24 years of age

Improve education in languages:

24. Distribution of pupils by number of foreign languages learned
25. Average number of foreign languages learned per pupil

Develop student mobility and international cooperation:

26. Inward/outward mobility of teachers and trainers, Erasmus + Leonardo
27. Inward/outward mobility of Erasmus students and Leonardo trainees
28. Foreign tertiary students as a percentage of all students enrolled, by nationality
29. Percentage of students of the country of origin enrolled abroad

---

* *Source:* European Commission, 2007.

Appendix 3

Example of a two-page presentation of a higher education indicator system – France

(A) Excerpt from *The State of Higher Education and Research in France*, No. 1 (2007 edition)*

08

79% of graduates enrol into higher education immediately. General baccalauréat graduates enrol less often in general university courses, while technological and vocational baccalauréat graduates enrol mostly in STS (Advanced Technical Courses). In total, 55% of the young people of a generation have access to higher education.

Of the 524,100 young people who were awarded a general, technological or vocational baccalauréat in 2006 in mainland France and overseas departments, 78.7% enrolled the following year in higher education (see methodology), i.e. 1.2 points less than in 2005. While almost all those with a general baccalauréat enter higher education immediately, this is not the case for holders of a technological baccalauréat, whose entry rate of 75.9% in 2006 is decreasing sharply (-2.7 points) compared with the previous academic year. The proportion of vocational baccalauréat holders enrolling immediately into higher education amounts to 22.6%. These rates do not take into account enrolments in STS within the framework of apprenticeship, or continued studies under qualification contract, or continued studies in other countries.

University remains the favourite destination of general baccalauréat holders but a little less so each year: only 58.8% enrolled in university (excluding IUTs) in 2006, compared with 66.7% in 1997 (Figure 01). The exceptional increase in the number of candidates who passed the 2006 session of the general baccalauréat (mostly S section baccalauréat graduates) had no equivalent effect on the number of new general baccalauréat holders enrolling in university (excluding IUT). 31.4% of general baccalauréat holders opted for a selective course (CPGE – Preparatory Class for Grandes Écoles, IUT, STS) at the beginning of the 2006 academic year, a proportion similar to 2005.

The orientation of general baccalauréat graduates varies significantly depending on the baccalauréat section. Scientific baccalauréat graduates (S section) distinguish themselves by the variety of their orientation, strongly oriented towards preparatory classes. Of all the S-section baccalauréat graduates of the 2002 session who continued in higher education immediately after their baccalauréat, 19% enrolled in CPGE, 44% in university (excluding IUT) and 15% in IUT. Baccalauréat graduates from the L (arts) and ES (economic and social) sections are considerably more attracted to university (excluding IUT): 69% of L baccalauréat graduates and 57% of ES baccalauréat graduates continue in a licence course (Figure 02).

Technological baccalauréat graduates mostly enrol in short technological courses, in particular STS: 63% of STI and 49% of STT baccalauréat graduates.

In total, 55% of the young people of a generation have access to higher education the year following their baccalauréat graduation or, for some, one year later. This rate exceeds 80% for the children of teachers and senior managers and is below 50% for the children of craftsmen, shopkeepers, white-collar and blue-collar workers (diagram 03).

As one student can enrol in more than one course, basic entry rates per course do not add up. However, assuming that multiple enrolments are marginal for technological baccalauréat holders, an entry rate can be calculated for them: 75.9% in 2006. Based on a 100% entry rate for general baccalauréat holders, the overall entry rate of general and technological baccalauréat holders is estimated at 92.0% in 2006 (92.7% in 2005). A similar calculation including vocational baccalauréat holders gives a 78.7% estimated entry rate to higher education for all 2006 baccalauréat graduates, compared with 79.9% in 2005.

Other courses correspond with new baccalauréat holders enrolled in non-university engineering schools, higher education institutions not attached to universities (business, management, sales, accountancy, notary studies, architecture, various specializations), art and cultural schools, private faculties, paramedical (2005–2006 figures) and social science schools (2004–2005 figures).

The years appearing in the figures represent entry dates, 2006 means the start of the 2006 academic year or academic year 2006–2007.

* *Source:* Adapted from France, Ministry of Education, 2007.

(B) Excerpt from *The State of Higher Education and Research in France* – Tables and figures

Access to higher education 08

01 Immediate registration rate of baccalauréat holders in various types of higher education

Mainland France and OT

	1997	2001	2002	2003	2004	2005	2006	2007
General Baccalauréat								
University (excl. IUTs)	66.7	61.8	61.5	62.4	62.8	62.1	61.3	58.8
IUT	9.8	11.2	11.5	11.4	10.7	10.7	10.4	10.4
CPGE	13.0	12.6	13.1	13.6	13	13.6	13.3	13.2
STS	9	9	8.9	8.4	8	7.8	7.7	7.8
Other	7.7	9.1	9.6	9.7	9.7	10.8	11.1	10.8
Technical Baccalauréat								
University (excl. IUTs)	22	19.1	18.2	17.8	18.1	18.1	18.1	17.4
IUT	10.2	9.1	9.3	9.5	10	10.2	10.4	9.9
CPGE	0.9	1	1	1.1	1	1.1	1.1	1.1
STS	46.1	44.5	44.7	45.8	45.1	44.1	44	42.5
Other	3	3.9	3.9	4.2	4.2	4.7	5	5
General and Technical Combined								
University (excl. IUTs)	51.7	46.4	45.7	46.6	47.3	46.5	46.5	45
IUT	9.9	10.5	10.7	10.7	10.4	10.5	10.4	10.3
CPGE	8.9	8.4	8.7	9.1	8.9	9.2	9.1	9.2
STS	21.5	21.8	21.9	21.7	20.9	20.6	20.1	19.3
Other	6.1	7.2	7.5	7.7	7.8	8.6	9	8.9
Vocational Baccalauréat								
University (excl. IUTs)	6.8	6.4	5.8	6	6.3	6.4	5.9	5.8
IUT	0.8	0.5	0.6	0.6	0.7	0.7	0.8	0.7
CPGE	0	0	0	0	0	0	0	0
STS	8.9	9.7	10.9	12.8	14.4	15.2	15.7	15.5
Other	0.8	0.5	0.6	0.6	0.6	0.6	0.6	0.6
All Baccalauréats Combined (General, Technical, Vocational)								
University (excl. IUTs)	44.5	39.2	38.3	38.9	39.8	38.9	39.1	37.5
IUT	8.5	8.7	8.8	8.8	8.7	8.7	8.7	8.4
CPGE	7.5	6.9	7.1	7.4	7.3	7.4	7.4	7.4
STS	19.5	19.6	19.9	20	19.7	19.6	19.3	18.6
Other	5.3	6	6.2	6.4	6.5	7.1	7.5	7.3

Sources: MEN-MESR-DEPP.

02 Type of higher education 2002 baccalauréat graduates were pursuing as of 31 October 2002, by their baccalauréat series

Mainland France, in %

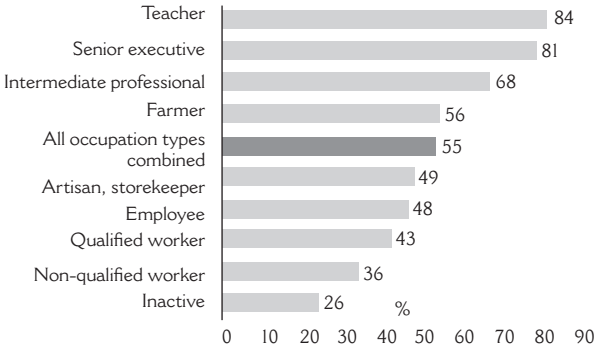
	ES	L	S	STI	STT
CPGE	6	8	19	2	0
University:	57	69	44	7	21
Law – economics – AES[1]	26	10	4	-	8
Letters – languages – humanities and social sciences	26	57	6	2	11
Sciences, STAPS[2], health	5	2	34	5	2
UIT	13	1	15	16	10
STS	9	6	6	63	49
Other	12	11	15	5	6
Total in higher education	**96**	**95**	**99**	**93**	**86**

Sources: MEN-MESR-DEPP (2002 cohort).

1. Administration, economics, and social sciences.
2. Sciences and techniques of physical activities and sports.

03 Entry rate into higher education of a generation, by a parent's occupation

Mainland France



Sources: MEN-MESR-DEPP (1989 panel).

Appendix 4

20 core indicators for monitoring progress towards the Lisbon objectives in education and training (European Union)*

1) Participation in pre-school education
2) Special needs education
3) Early school leavers
4) Literacy in reading, mathematics and science
5) Language skills
6) ICT skills
7) Civic skills
8) Learning to learn skills
9) Upper secondary completion rates of young people
10) School management
11) Schools as multi-purpose local learning centres
12) Professional development of teachers and trainers
13) Stratification of education and training systems
14) Higher education graduates
15) Cross-national mobility of students in higher education
16) Participation of adults in lifelong learning
17) Adults' skills
18) Educational attainment of the population
19) Investment in education and training
20) Returns to education and training

Some of these indicators – for example, civic skills, language skills, and professional development of teachers and trainers – have not yet been clearly defined in terms of concrete objectives. The above list can therefore be considered an intermediate stage before the precise definition of objectives. When this work has been completed, these 20 core indicators are to replace the 29 indicators from 2004 (*Appendix 2*).

* *Source:* European Commission, 2007.

Appendix 5

Main indicators used internationally and how they are calculated

- Expenditure on higher education as a percentage of GDP: the ratio of all domestic expenditure on higher education, from whatever source, to the GDP of a given country.
- Public expenditure on higher education as a percentage of all public expenditures: the ratio of expenditure on higher education to total public expenditure.
- Average expenditure per student in higher education: the ratio of total expenditure on higher education to the total number of students in higher education.
- Cumulative expenditure per student for the average duration of higher education: expenditure per student (as described above) multiplied by the average duration of studies in higher education.
- Public versus private expenditure on higher education: proportion of public or private expenditure on higher education compared to total expenditure on higher education.
- Entry rate into higher education distinguishing between levels 5A and 5B: the number of new entrants into higher education divided by the population x years of age (reference age).
- Gross enrolment rate in higher education: total student population in higher education divided by the population x years of age (reference age group, usually 18–24 years).
- Doctorate graduation rate: the number of holders of doctoral degrees in a given year divided by a reference population.
- Graduation rate for 5A: the number of level 5A graduates (see definition of 5A in *Appendix 1*) in a given year divided by a reference population.
- Graduation rate for 5B: the number of level 5B graduates (see definition of 5B in *Appendix 1*) in a given year divided by a reference population.
- Graduation rate in the sciences: the number of graduates in the sciences in a given year divided by a reference population.
- Expected years in higher education (education expectancy).
- Proportion of higher education graduates in the 25–34 age group: the number of higher education graduates 25–34 years of age divided by the total population 25–34 years of age.
- Comparison of the proportion of higher education graduates 25–34 years of age with those 25–64 or 55–64 years of age: the ratio between the proportions of graduates in these age groups.
- Proportion of foreign students in higher education: the number of foreign students divided by the total number of students.
- Employment rate of higher education graduates: the number of employed graduates divided by the total number of graduates (in a given age group or cohort of graduates).
- Unemployment rate of higher education graduates: the number of unemployed graduates divided by the total number of graduates able to work (in a given age group or cohort of graduates).
- Proportion of employed higher education graduates as a percentage of people 25–64 years of age: the proportion of graduates 25–64 years of age with a job among all employed people in the population 25–64 years of age.
- Relative earnings from employment of higher education graduates: the ratio between the mean salary or wage of higher education graduates and the mean salary or wage of people having completed upper secondary school.
- Salary or wages of higher education graduates: the mean salary or wage of graduates in a given age group or cohort of graduates.
- Success or survival rate: ratio of the number of students who graduated from an initial degree during the reference year to the number of new entrants into this degree n years before, with *n* being the number of years of full-time study required to complete the degree.

Appendix 6

The Berlin Principles on Ranking of Higher Education Institutions*

Formally adopted in May 2006 by the International Ranking Expert Group (IREG), these principles comprise 16 recommendations divided into categories, as follows.

Rankings and league tables should:

A) Purposes and Goals of Rankings

1. *Be one of a number of diverse approaches to the assessment of higher education inputs, processes, and outputs.* Rankings can provide comparative information and improved understanding of higher education, but should not be the main method for assessing what higher education is and does. Rankings provide a market-based perspective that can complement the work of government, accrediting authorities, and independent review agencies.
2. *Be clear about their purpose and their target groups.* Rankings have to be designed with due regard to their purpose. Indicators designed to meet a particular objective or to inform one target group may not be adequate for different purposes or target groups.
3. *Recognize the diversity of institutions and take the different missions and goals of institutions into account*. Quality measures for research-oriented institutions, for example, are quite different from those that are appropriate for institutions that provide broad access to underserved communities. Institutions that are being ranked and the experts that inform the ranking process should be consulted often.
4. *Provide clarity about the range of information sources for rankings and the messages each source generates*. The relevance of ranking results depends on the audiences receiving the information and the sources of that information (such as databases, students, professors, employers). Good practice would be to combine the different perspectives provided by those sources in order to get a more complete view of each higher education institution included in the ranking.
5. *Specify the linguistic, cultural, economic, and historical contexts of the educational systems being ranked*. International rankings in particular should be aware of possible biases and be precise about their objective. Not all nations or systems share the same values and beliefs about what constitutes 'quality' in tertiary institutions, and ranking systems should not be devised to force such comparisons.

B) Design and Weighting of Indicators

6. *Be transparent regarding the methodology used for creating the rankings*. The choice of methods used to prepare rankings should be clear and unambiguous. This transparency should include the calculation of indicators as well as the origin of data.
7. *Choose indicators according to their relevance and validity.* The choice of data should be grounded in recognition of the ability of each measure to represent quality and academic and institutional strengths, and not availability of data. Be clear about why measures were included and what they are meant to represent.
8. *Measure outcomes in preference to inputs whenever possible*. Data on inputs are relevant as they reflect the general condition of a given establishment and are more frequently available. Measures of outcomes provide a more accurate assessment of the standing and/or quality of a given institution or programme, and compilers of rankings should ensure that an appropriate balance is achieved.

* *Source:* IREG, 2006.

9. *Make the weights assigned to different indicators (if used) prominent and limit changes to them*. Changes in weights make it difficult for consumers to discern whether an institution's or programme's status changed in the rankings due to an inherent difference or due to a methodological change.

C) Collection and Processing of Data

10. *Pay due attention to ethical standards and the good practice recommendations articulated in these Principles*. In order to assure the credibility of each ranking, those responsible for collecting and using data and undertaking on-site visits should be as objective and impartial as possible.
11. *Use audited and verifiable data whenever possible*. Such data have several advantages, including the fact that they have been accepted by institutions and that they are comparable and compatible across institutions.
12. *Include data that are collected with proper procedures for scientific data collection*. Data collected from an unrepresentative or skewed subset of students, faculty, or other parties may not accurately represent an institution or programme and should be excluded.
13. *Apply measures of quality assurance to ranking processes themselves*. These processes should take note of the expertise that is being applied to evaluate institutions and use this knowledge to evaluate the ranking itself. Rankings should be learning systems continuously utilizing this expertise to develop methodology.
14. *Apply organizational measures that enhance the credibility of rankings*. These measures could include advisory or even supervisory bodies, preferably with some international participation.

D) Presentation of Ranking Results

15. *Provide consumers with a clear understanding of all of the factors used to develop a ranking, and offer them a choice in how rankings are displayed*. This way, the users of rankings would have a better understanding of the indicators that are used to rank institutions or programs. In addition, they should have some opportunity to make their own decisions about how these indicators should be weighted.
16. *Be compiled in a way that eliminates or reduces errors in original data, and be organized and published in a way that errors and faults can be corrected*. Institutions and the public should be informed about errors that have occurred.

These 16 principles can be synthesized into four major recommendations:

- Take into account the diversity of institutions and their missions and specific purposes.
- Use a clear and transparent methodology.
- Preferably use indicators of outputs and performance, based on accurate and comparable data.
- Clearly communicate to 'consumers' all the methods used and provide a choice in how the rankings are displayed.

IIEP publications and documents

More than 1,500 titles on all aspects of educational planning have been published by the International Institute for Educational Planning. A comprehensive catalogue is available in the following subject categories:

Educational planning and global issues

General studies – global/developmental issues

Administration and management of education

Decentralization – participation – distance education – school mapping – teachers

Economics of education

Costs and financing – employment – international cooperation

Quality of education

Evaluation – innovation – supervision

Different levels of formal education

Primary to higher education

Alternative strategies for education

Lifelong education – non-formal education – disadvantaged groups – gender education

Copies of the Catalogue may be obtained on request from:
IIEP, Publications and Communications Unit
info@iiep.unesco.org
Titles of new publications and abstracts may be consulted online:
www.iiep.unesco.org

The International Institute for Educational Planning

The International Institute for Educational Planning (IIEP) is an international centre for advanced training and research in the field of educational planning. It was established by UNESCO in 1963 and is financed by UNESCO and by voluntary contributions from Member States. In recent years the following Member States have provided voluntary contributions to the Institute: Australia, Denmark, India, Ireland, Netherlands, Norway, Spain, Sweden, and Switzerland.

The Institute's aim is to contribute to the development of education throughout the world, by expanding both knowledge and the supply of competent professionals in the field of educational planning. In this endeavour the Institute cooperates with training and research organizations in Member States. The IIEP Governing Board, which approves the Institute's programme and budget, consists of a maximum of eight elected members and four members designated by the United Nations Organization and certain of its specialized agencies and institutes.

Inquiries about the Institute should be addressed to:
The Office of the Director, International Institute for Educational Planning,
7–9 rue Eugène Delacroix, 75116 Paris, France

The publication

In order to respond to growing demand, higher education systems are diversifying and reforming themselves. Their expansion involves a rapid transformation of institutional frameworks, educational offers, and teaching practices, but also modes of governance. In particular, in exchange for more autonomy granted to higher education institutions, public authorities are requesting these institutions to develop their own policies and engage in strategic planning, and to demonstrate the results achieved.

Higher education institutions are therefore obliged to strengthen their management capacity, as well as their information systems and monitoring tools. Within this context, an indicator system is becoming an indispensable management and communication tool.

What is the best way of developing an indicator system for higher education? This publication represents a useful methodological guide to help education planners realize an indicator project. It shows how to proceed by methodological steps, by establishing a clear link between the context in which an indicator system is based and its objectives.

The authors

Michaela Martin is a Programme Specialist at IIEP. She specializes in policy analysis, planning, and management of higher education, where she is in charge of a research programme and training on external quality assurance in higher education. She has authored many publications and books on various subjects in this field.

Claude Sauvageot is Special Adviser to the Director of the Department of Evaluation, Forecasting and Performance (DEPP), Ministry of National Education and Ministry of Higher Education and Research, France. He is also on the teaching staff at the University of Sorbonne (Paris V), Faculty of Social and Human Sciences, and chairperson of the working group on Indicators of Education Systems (INES) for the OECD. He is the author of several articles and publications, notably on education indicators.

United Nations
Educational, Scientific and
Cultural Organization

International Institute
for Educational Planning

United Nations
Educational, Scientific and
Cultural Organization

UNESCO
INSTITUTE
for
STATISTICS

ISBN: 978-92-803-1329-1
International Institute for Educational Planning www.iiep.unesco.org