Teacher Management

Module 4

Teacher allocation and utilisation

Teacher's College, Zambia. Credit: GPE/Alexandra Humme

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List of abbreviations

AWH	Average working hours
EFA	Education for all
EMIS	Education management information system
GMR	Global monitoring report
HRM	Human resources management
PTR	Pupil-teacher ratio
PTTR	Pupil-trained teacher ratio
SSA	Sub-Saharan Africa
UIS	UNESCO Institute for Statistics
UR	Utilisation rate
UUR	Under-utilisation rate
WEI	World Education Indicators

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Module 4. Teacher allocation and utilisation

This module aims to address teacher management from the angle of the allocation/assignment and optimal utilisation of teaching staff.

The module will begin by clarifying the concepts of teacher "allocation", "deployment" and "assignment", as well as that of "utilisation". It will then look at the analytical framework and some of the tools commonly used for the diagnosis of effective teacher allocation and utilisation. Common indicators such as pupil-teacher ratio (PTR), degree of coherence and utilisation rates will also be clarified.

The sections devoted to the diagnosis of problems of allocation and of utilisation will be followed respectively by a discussion of the major factors, especially those to do with management (organisation, rules and procedures, management tools and behaviour), contributing to these problems.

Part 1 presents the issue or, more precisely, the context, of the quest for optimisation in teacher management.

Part 2 explains the concepts related to teacher allocation and presents the key diagnostic indicators. Special attention will be paid to inter and intraregional disparities. **Part 3** identifies the factors that can contribute to allocation problems, particularly those linked to the management system already in place.

Part 4 explains the issue linked to the question of statutory working hours in a comparative perspective and presents the main indicators used to carry out a diagnosis of teacher utilisation. Factors that can contribute to poor teacher utilisation are covered in **Part 5**.

Part 6 presents some conclusions and proposals for possible ways of improving teacher allocation and utilisation.

Objective of the module:

The main aim of Module 4 is to assist decision makers and those managing the education sector to better assess, and be more effective in, human resources management (HRM); it does so more particularly by providing tools to measure the coherence of teacher allocation and utilisation. It also looks at some of the factors influencing teacher allocation and utilisation, and which are to be taken into account when addressing the challenges faced today in the crucial field of management.

Content of the module:

The module covers the following points:

- Context, observations, definitions and current challenges related to an equitable and effective distribution of teachers;

- Diagnostic tools to take stock of the phenomenon of teacher allocation;

- Diagnostic tools to take stock of the phenomenon of teacher utilisation;

- Main factors contributing to teacher allocation and utilisation issues;

- Examples of levers for effective deployment and of options selected in relation to the diverse political and financial contexts.

Expected learning outcomes:

By the end of Module 4, participants should be able to:

- Define the notions of teacher allocation, deployment and utilisation;

- Calculate the pupil-teacher ratio, and the degree of randomness and utilisation rates of teachers;

- Diagnose disparities in teacher distribution and utilisation with the aid of the indicators mentioned above;

Analyse the main factors liable to be conducive to suboptimal teacher allocation and/or utilisation and explore some possible improvement strategies.

Questions for consideration:

During Module 4, you will be invited to participate in an online debate related to possible solutions to allocation and utilisation problems, complete the self-assessment test and participate in the group work.

Reading (optional):

In addition to the present document related to Module 4, we strongly recommend that you read the following documents. They are available on the course's electronic learning platform.

- Améléwonou, K, 2004. *Le problème de l'allocation du personnel enseignant au sein des écoles sénégalaises*. Pôle de Dakar.

- Mingat, A. 2003. *Questions de gestion de l'éducation dans les pays d'Afrique sub-saharienne. Diagnostic et perspectives d'amélioration dans le contexte de l'initiative accélérée pour la scolarisation primaire universelle*. PSAST/AFTHD, World Bank: Washington.

- Mingat, A. 2004. *Note pour l'amélioration de l'allocation des personnels aux écoles au niveau de l'enseignement primaire*. World Bank, PSAST/AFTHD. Washington.

- UNESCO. 2010. *Methodological guide for the analysis of teacher issues. Teacher Training Initiative for Teachers in Sub-Saharan Africa (TTISSA). Teacher policy development guide.* Paris, UNESCO. Chapter 4.

Part 1. The issue

1.1 Introduction

This module sets out to look at rational teacher management firstly from the angle of adequate teacher distribution among the territory's schools. Indeed, after recruiting and training teachers (Module 3), the acute question of their allocation to the schools arises. More particularly in a context of teacher shortage, effective teacher *allocation* can limit the need for recruiting new teachers and, hence, control expenditure.

Secondly, in order to address the growing demand for teachers (which is a direct consequence of demographic growth and of enrolment policies or trends since the 1990's), while at the same time curbing expenditure, it is also important to look at the issue of optimal teacher *utilisation*.

1.2 Introduction to the principal challenges of teacher allocation and utilisation

As will be explained in this sub-section, suboptimal utilisation and allocation of teaching staff contributes both to a waste of resources and to greater inequalities in the education services provided.

1.2.1 Quantitative Imbalances

Upon analysis, the distribution of teachers throughout the territory often shows significant inter-regional and intra-regional disparities, which are very often linked to the **urban/rural divide**.

Remote regions tend to be deserted by teachers, obliging communities to recruit teachers locally. Most of the time, these teachers are unqualified. The table and figure below present the quantitative imbalances observed in the inter-regional distribution of primary school teachers in 11 sub-Saharan African countries using the pupil-teacher ratio (PTR) as an indicator, i.e. the average number of pupils per teacher. In the same way, the table highlights the differences between countries. The reference to international standards, which generally fix a PTR limit of 40/1 (UNESCO, 2010), also helps in appreciating the scale of the quantitative imbalances in terms of teacher allocation within each country and between countries.

Table 1.1: Variation in pupil-teacher ratios at provincial level for some sub-Saharan African countries

Country	Pupil-teacher ratio			
	Lowest	Highest	Average	Gap
Benin (2005-2006) without community teachers	55	92	74	37
Benin (2005-2006) with community teachers	/	/	47	/
Burkina Faso (2005-2006)	45	56	50	11
The Gambia (2005-2006) lower secondary	36	49	41	13
Eritrea	30	53	48	23
Lesotho (2005)	38	47	42	9
Malawi (2006)	36	120	80	84
Uganda (2006)	32	93	48	61
CAR (2006) without community teachers	109	575	199	466
CAR (2006) with community teachers	78	109	92	31
Tanzania (2006)	40	69	52	29
Zambia (2006)	46	79	64	33
Zanzibar (2006)	23	54	33	31

Except when indicated, data do not distinguish between civil servant teachers and community teachers, or between public and private sector teachers. Benin data exclude community teachers. CAR data include community teachers. Countries sorted by average pupil/teacher ratio.

Source: Pôle de Dakar, 2009

Graph 1.1: National averages can hide large differences in pupil/teacher ratios
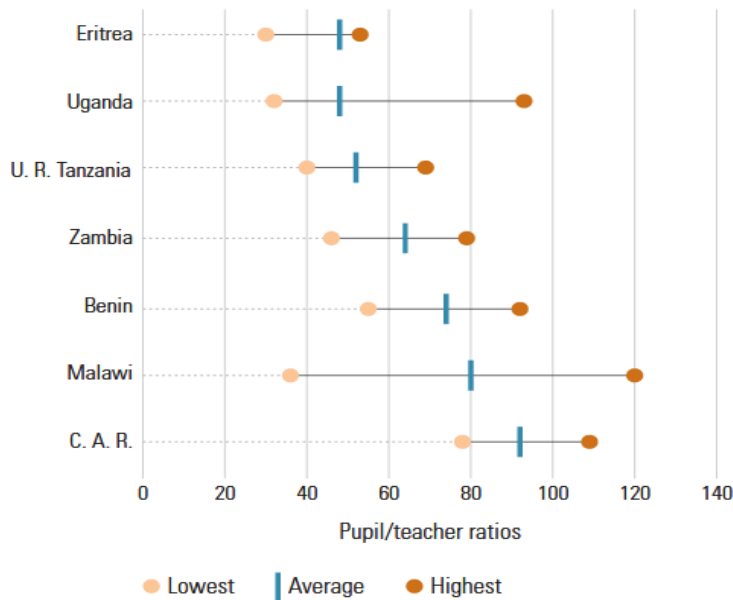
Provincial disparities in primary education pupil/teacher ratios, selected sub-Saharan African countries circa 2005/2006

Note: Except where indicated, data do not distinguish between civil servant teachers and community teachers, or between public and private sector teachers. Benin data exclude community teachers. C. A. R. data include community teachers. Countries sorted by average pupil/teacher ratio.

Source: UNESCO, 2010

1.2.2 Qualitative aspects of imbalances in teacher distribution

In some countries, the imbalance observed is not to do with the absolute shortage of teachers but with inequalities in teacher distribution of a qualitative nature.

As indicated in the example below, in some countries, such as Madagascar, Mozambique, Sierra Leone and Togo, the pupil-trained teacher ratio (PTTR) exceeds 80/1 (graph 1.2 below). In 15 of the 40 countries for which data are available, the proportion of trained teachers has deteriorated since 1999. In Togo, the proportion has fallen from 31 to 15% with a move toward hiring contract teachers (UNESCO, 2010).

Graph 1.2: Trained teachers are sometimes in short supply

Ratios of pupils to teachers and pupils to trained teachers in primary education, selected countries, 2007
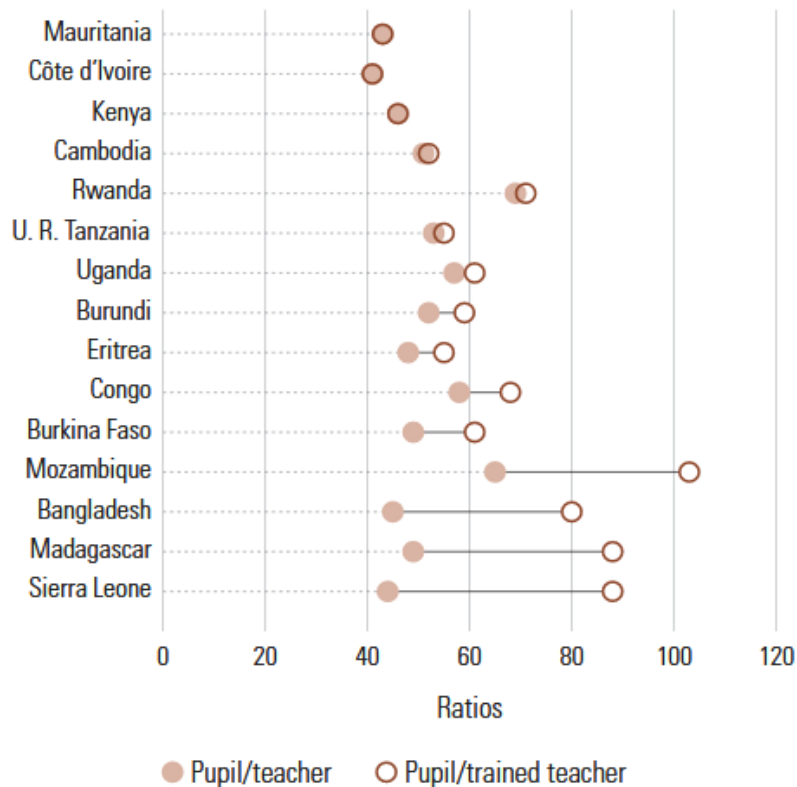
Note: Among countries with available data, only those with pupil/teacher ratios at or above 40:1 are included. Countries sorted by the gap between the pupil/teacher and the pupil/trained teacher ratios.

Source: UNESCO, 2014 (drawn from UIS database)

There is a very large difference between PTR and PTTR in some countries, indicating the scale of the challenges faced by those countries in terms of teaching qualifications. While globally pupil-teacher ratios tend to be higher in urban areas than in rural areas, trained teachers are often concentrated in urban areas. As an example, in Kampala, the capital of Uganda, 60% of teachers are trained, whereas this is the case for only 11% of teachers in rural districts (UNESCO, 2014).

Mastering measurement tools aimed at assessing the coherence of teacher allocation will enable the analysis of teacher distribution throughout the territory and an estimation of the degree of effectiveness and equity of existing allocation systems. Some of these measurement tools are presented in Part 2.

1.2.3 The question of « optimal » teacher utilisation

In order to provide an educational service in line with set objectives while curbing expenditure, it is important not only to allocate teaching staff equitably and rationally but also to ensure optimal teacher utilisation.

The 'optima' utilisation of teaching staff raises a number of major questions and, more particularly:

Is the workload demanded of teachers 'optimal'?

When looking to define the 'optimal' working hours to be demanded of each teacher, the initial observation is that teachers' statutory working hours vary considerably from country to country.

A study by the UNESCO Institute for Statistics (UIS) (UNESCO-UIS 2006) shows that regulations in most countries in Europe and Asia stipulate between 1600 and 1800 working hours per annum for teachers, whilst those in force in sub-Saharan Africa generally provide for between 800 and 1300 hours per year.

As shown in graph 1.3 below concerning primary education, the differences are lower when taking into account teaching time alone (and not the working hours to be put in aside from actual teaching).

Graph 1.3: Statutory teaching hours per year in primary education
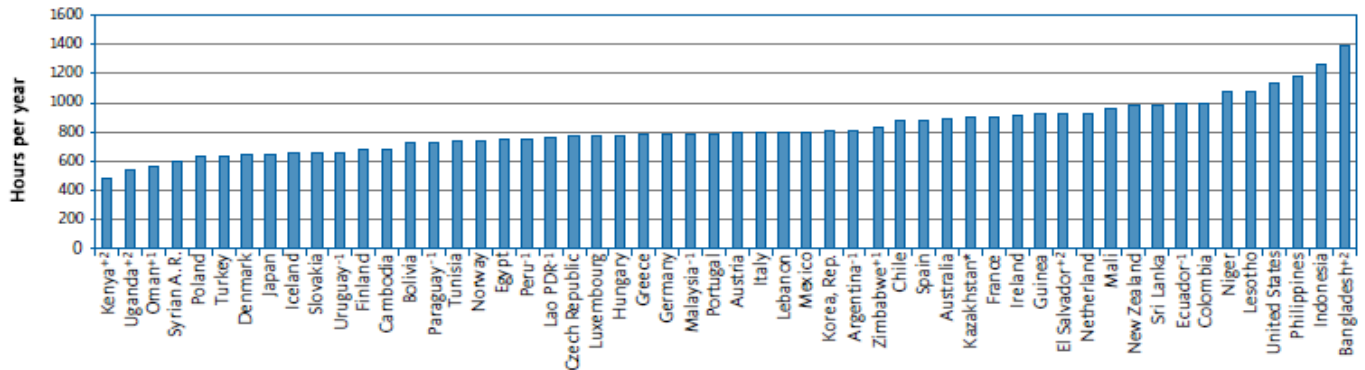
Source: UIS, 2006

In fact, in most countries, the statutory teaching hours of teachers are lower than the statutory working hours of other professions; however, it must be admitted that teachers also spend (or should spend) a considerable amount of time on teaching-related activities: lesson preparation, correction, extra-curricular activities, etc. In the European and Asian countries as mentioned, an attempt has been made to take this fact into account by including time for necessary teaching-related activities, generally required of teachers by the school, in the statutory working hours.

However, the variations emerging from international comparisons should attract the attention of decision makers and managers and prompt them to (re)position the question of 'adequate working hours' and the different angles of its appreciation in the context of a social dialogue.

Do the working hours of teachers in posts correspond to statutory working hours?

It is important to address another core issue, both from the perspective of the rational utilisation of resources and that of the provision of equitable quality education; that is the 'full' utilisation of teaching staff in all schools. In other words, are there sufficient, insufficient or surplus teachers in the schools in order to deliver the assigned volume of hours (the volume of hours assigned to each school depending on the school curricula and specialization streams/options and specific school projects when applicable)?

'Full utilisation' of existing staff does not only depend on effective timetable management at school level but also on other factors, particularly the size and structure of the schools, how versatile the teachers are, their employment flexibility (e.g. possibility of assignments in several schools), etc.

Parts 4 and 5 will deal respectively with the common indicators for assessing teacher utilisation and the factors involved in the quest for optimisation.

To what extent do teachers actually deliver the scheduled teaching time in the classroom?

Finally, in order to calculate if all pupils actually receive the volume of hours due to them in line with the official school curricula, it is essential to know whether teachers actually deliver their teaching time in the classroom.

Teacher absenteeism is a major problem for many countries. In fact it is estimated that absenteeism is the cause of a significant loss of instructional time: between 12 and 43 days (out of 170 days of class per annum on average at primary school level) according to recent research conducted in different parts of the developing world (UNESCO, 2008). As such, absenteeism denies pupils 8 to 25% of instructional time per annum.

This issue should however be approached with great care and precision. There is no denying that, in many countries, data available on teacher absenteeism are neither complete nor reliable and are often difficult to access for human resources managers at supra-school levels.

In addition, it is important to clearly distinguish the different possible causes of absenteeism: this can in some cases be explained by health problems (connected to HIV/AIDS for example), in other cases by management problems such as late payment of salaries in remote areas (leading teachers to be absent for travel purposes); in yet other cases, the only explanation for absence is the teacher preferring to use his/her time differently (another paid or unpaid activity).

It is clear that the possibilities and ways of reducing teacher absenteeism are not the same for these different situations.

Due to the time limit on this Module, the present material focuses on the first two questions related to teacher utilisation, while recognising the importance of monitoring and reducing as much as possible teacher absenteeism.

☰ Highlights

- The challenge of the rational management of teacher assignments is therefore twofold:

  - Firstly, it implies covering the needs of the education system by the best possible deployment of teachers in order to guarantee equal access to all children throughout the same territory.

  - In addition, it is important to ensure a balanced assignment of personnel in terms of quality (qualifications, status, etc.), the first imperative being generally to attract and maintain qualified teachers in rural areas.

- Teachers must be allocated equitably and rationally; however, special care must be taken to ensure optimal utilisation in order to respect the set objectives while controlling expenditure.

Part 2. Diagnosing teacher allocation

2.1 Defining the concepts

Teacher allocation, also known as **deployment**, refers to the distribution of teachers throughout the territory and to their assignment to schools.

"The analysis of coherence in teacher allocation throughout the territory is based on the simple principle of considering that the number of teachers in a school should be connected to the number of pupils. The more pupils in a school, the more teachers there should be and, consequently, schools with the same number of pupils should have roughly the same number of teachers. We need therefore to look at the relationship between the number of pupils and the number of teachers in a school"[1].

The analysis of allocation coherence leads to examining teacher allocation in **primary** school education, where the teacher is in charge of a class, and in **secondary** and **tertiary** education, where the teacher is involved with several classes and where each class has several teachers.

In secondary education, the analysis of allocation leads both to exploring the question of teacher **utilisation** and to checking if the number of working hours actually served in the schools corresponds to their due statutory working hours.

Several indicators enable the evaluation of teacher allocation and utilisation and the diagnosis of the geographical distribution of teachers both quantitatively and qualitatively.

2.2 Diagnosing allocation (questions, indicators, calculations)

This is about determining whether the transfer of resources (teachers) from central level to local level (schools) is coherent, i.e. globally proportional to the number of pupils enrolled. Indeed, some differences can be explained by a more or less difficult context: it may be justified to allocate more resources to schools operating in a more difficult context. In the same way, one can expect schools faced with the same difficulties to benefit from an equal allocation of resources.

Allocation coherence thus enables identification of under- or over-allocated schools and offers, by extension, a prospective vision of the direction that the education service should be taking in order to be both effective and equitable. Indeed, the diagnosis of unequal allocation will enable the identification of future needs or of the adjustments to be made to meet those needs.

2.2.1 Indicators

Several indicators are used to measure coherence in teacher deployment.

- The **pupil-teacher ratio (PTR),** i.e. the average number of pupils per teacher, and the **functioning classroom-teacher ratio.** These are calculated at national, regional or local (per school) level.

- The **determination coefficient** (R^2) or **degree of coherence**, a statistical tool for appreciating the quality of the relationship between the number of pupils and the number of teachers.

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[1] Universal primary education in Africa: the teacher challenge, Pôle de Dakar, 2009

Its value ranges from 0 to 1 (1 demonstrating a perfect adequation between the number of pupils and the number of teachers).

- **The indicator (1- R²)** representing the share of the phenomenon of teacher distribution linked to factors other than the number of pupils in the schools. Expressed as a percentage, it corresponds to what is known as the **degree of randomness**. Unlike the determination coefficient (R^2), a high indicator ($1- R^2$) will indicate a high degree of randomness in the distribution of teachers throughout the territory.

PTR

The first commonly used technique to diagnose a disparate allocation of teachers consists in calculating the pupil-teacher ratio (PTR). The PTR relates the number of enrolled pupils to the number of teachers available at national level and enables the comparison of the degree of coherence in teacher allocation nationally. The same operation can be carried out at regional or at local (i.e. school) level. It enables the comparison, at national level, of the different PTR ratios between the *regions*, *départements* and other geographical subdivisions. This provides a very interesting focus, which is of direct use in the management of the education system since it pinpoints any imbalances.

Starting from school statistics, followed by the calculation of the PTR, countries can then measure the gap between the norm initially selected by the country and what has actually been achieved in the field. As such, the PTR is of i) diagnostic and ii) prospective value in that it can at the same time:

i)   Point out imbalances through a review of the situation;

ii)   Seek the cause of these imbalances (malfunctioning); and

iii)   Determine the adjustments required in order to reach the norms set at central level.

The PTR can be associated with another variable, i.e. the number of trained teachers. The pupil-trained teacher ratio (PTTR) thus obtained enables a more precise view of the distribution of trained teachers throughout the territory and the detection of any unequal concentration of trained teachers.

In the same way, the PTR can be calculated in order to compare the allocation of teachers according to their assignment area: urban or rural, given that a marked imbalance has generally been noticed between the two in favour of urban areas. Moreover, this calculation can be made by adding another variable (X) to enable a finer representation of the distribution of teachers throughout the territory between urban and rural areas, with the X variable reflecting the teacher's "training", "experience", "gender", "academic level", etc.

Functioning classrooms-teacher ratio

Insofar as primary school teachers are generally allocated according to the number of functioning classes (one teacher per classroom), the relationship between the number of teachers and the number of classrooms can also be evaluated. The ratio enables to measure the quality of the relationship between the number of teachers and the allocation key variable, here the number of functioning classrooms.

Even so, the most commonly used indicator to determine the degree of coherence in teacher allocation is still the PTR. This is indeed the indicator that is commonly used to establish international comparisons regarding teacher allocation in different countries or to apprehend its evolution over time for a specific country.

<u>Degree of randomness and determination coefficient (R²)</u>

The second technique used to appreciate the quality of the relationship between the number of pupils and the number of teachers consists in calculating the **degree of randomness** in the allocation of teachers:

While the pupil-teacher ratio enables to determine, at national and regional level, whether a country has the necessary number of teachers given the number of pupils enrolled, it tends to conceal disparities between schools. The degree of randomness (or inversely the **degree of** coherence) is thus a relevant indicator for measuring the coherence of the relationship between the number of teachers and the number of enrolments per school and enables international comparisons to be made.

A statistical tool is used to analyse the degree of coherence: **the determination coefficient** or **R^2**. This indicator has a value of between 0 and 1:

- <u>The closer R^2 is to 1,</u> then the stronger the relationship, or in other words the more coherent the allocation of teachers, i.e. in relationship with the number of pupils. If the value of R^2 is 1, it means that the number of teachers is, in all schools, exactly as anticipated on the basis of the average relationship.

- <u>The closer R^2 is to 0</u>, the more pronounced the problems of coherence in teacher allocation, indicating that the distribution of teaching staff is linked to other factors than the number of pupils.

Figure 2.1: Interpretation of the coefficient of coherence
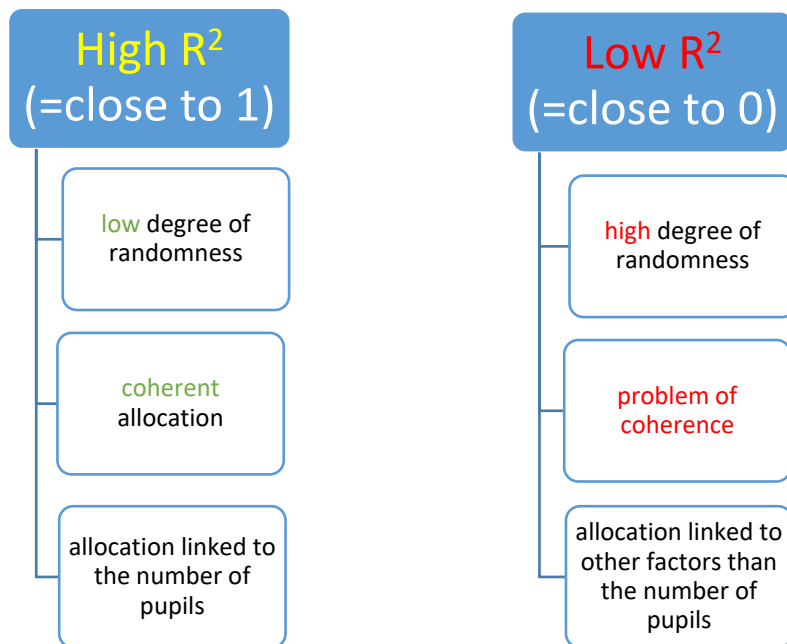
That comes down to saying that the inverse of R^2, that is $(1-R^2)$, is interpreted as the randomness in teacher allocation. It represents the share of teacher assignments to primary schools linked to other factors than the number of pupils enrolled in the schools. A high $(1-R^2)$ value will thus demonstrate a pronounced coherence problem in teacher deployment.

Table 2.1: Example of application of the coefficient of coherence

		Example		Interpretation
Determination coefficient (or degree of coherence)	R^2	= 0.3		Two-thirds of deployment is linked to factors other than the number of pupils = problem of coherence
Degree of randomness	$[1- R^2]$	= [1-0.3] = 0.7	Rate of randomness = $[1- R^2]$ x 100 = 70%	

The determination coefficient R^2 provides a measure of the degree of coherence in teacher allocation. It measures the share of inter-school variance in the number of teachers explained by the variance in the number of pupils. In other words, **the indicator (1- R²)** corresponds to what is known as **randomness in the allocation of** teachers, i.e. a measure of the proportion of allocations not made on the criteria of the number of pupils present in the schools.

While the degree of randomness indicator (1- R²) provides a measure of the scale of 'poor allocation', it does not say as such how many (what share of) schools are under-allocated in teachers. In other words, a high degree of randomness registered for a country or a region can conceal a substantial share of schools with too many teachers or, on the contrary, a high proportion of schools with too few teachers (compared to the norm or the average) or, yet again, the coexistence of the two phenomena. The graphic representation, explained in the question for consideration, enables a visualisation and a better appreciation of the respective share of schools below or above the norm.

In addition to comparisons within a specific country (the determination coefficient is calculated at regional level), the determination coefficient R^2 enables international comparisons as shown in Table 2.2 below. The latter shows differences between countries and also a serious problem of random distribution of teachers in the vast majority of countries.

Countries are ranked by ascending order of degree of randomness. Half of the 24 countries represented have a degree of randomness of over 25%, the average for the sample studied. While the degree of randomness indicated for **São Tome and Principe** or for **Guinea**, 3% and 9% respectively, demonstrates coherent teacher allocation to schools, the degree of randomness for Cameroon (45%) indicates that in almost one in every two schools the number of teachers is dependent on factors other than that of the number of pupils.

International comparisons, especially across countries characterised by similar levels of enrolment and of economic development, can enable decision makers and managers to appreciate to what extent teacher allocation is 'alarming' in their respective countries. However, it is essential to make a detailed analysis of the situation in each country, its topographical characteristics, its policy of schooling provision in remote areas, etc. in order to gain a good understanding of the factors really

contributing to the disparities observed in teacher allocation throughout the territory and across schools[2].

Table 2.2: Randomness in teacher allocation to public primary schools, 2004 or closest year

Pays	Degré d'aléa [1-R2]	Pays	Degré d'aléa [1-R2]
Sao Tomé et Principe	3	Gabon	26
Guinée	9	Mali	27
Mozambique	15	Burkina Faso	28
Namibie	15	Madagascar	28
Guinée Bissau	16	Ethiopie	29
Niger	19	Côte d'Ivoire	33
Sénégal	19	Malawi	34
Mauritanie	20	Ouganda	34
Zambie	20	**Togo**	**37**
Tchad	20	Bénin	39
Rwanda	21	Congo	40
Rep. Centrafricaine	22	Cameroun	45
		moyenne des 24 pays	25

Source: Brossard et al., 2006.

Qualitative analysis

Use of the above indicators can also support a qualitative analysis of educational provision and particularly of teacher deployment throughout the territory.

More precisely, the pupil-teacher ratio (PTR) can be calculated taking into account:

- teachers' academic level (Up to what level did they go to school? Have they secondary school or Baccalaureate level? Have they attended higher/tertiary education?);

- professional qualifications (Have they had vocational training? Have they passed an examination/a competitive examination certifying their ability to teach?);

- experience (How long have they been teaching? Have they a specific profile: teacher of primary/secondary/tertiary or specialised/vocational education...);

- subject matter taught;

- gender (male/female);

- status (civil servants, contract teachers, community teachers...);

- age.

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[2] Whether at country level or in an international comparison, when conducting an analysis of the randomness characterising teacher allocation, it is interesting to take into account teaching staff recruited and employed locally ('community', 'supply' and/or 'contract' teachers according to the terminology used). As a general rule, the local recruitment of teachers enables, at least in the short term, the reduction of under-allocation of teachers to schools in 'difficult' or remote areas, and so to reduce the degree of randomness.

It does not necessarily make sense to take all these factors into account in the PTR. The choice of variables will depend on what seems most relevant to the most serious problems on hand. It is however important in a diagnosis not to rely upon a single indicator. In order to have a complete picture, information provided by the PTR and the R^2 should be compared with other indicators. For example, the variables suggested above can be calculated in the form of a ratio (% qualified teachers, % experienced teachers, % female teachers, etc. and per region or urban/rural area). Moreover, when data are available, it is important to measure the evolution over time in order to identify trends.

The specificity of secondary education

In secondary education, the challenge of 'proper allocation' lies in the capacity to offer all schools a total number of hours corresponding to the required number of hours. In other words, for each school in the country, teaching time (as delivered by the teachers) must be the equivalent of instructional time (i.e. the total number of hours of instruction that pupils are meant to receive).

A discrepancy between the two variables could therefore mean: either problems of **teacher deficit and/or utilisation** (this is the case when teaching time is lower than instructional time for example) or problems of **teacher allocation** (when teaching time is higher than instructional time).

On this basis, the example below examines firstly the coherence in secondary teacher allocation in **Benin**.

Box 2.1: Coherence of teacher allocation in secondary education in Benin (2008-9)

Graph 2.1 links teaching time to instructional time for all 497 public general secondary schools in the country. In view of the educational programmes for the different pedagogical groups in the school, we know that a given global number of hours would be necessary: this is the **theoretical instructional time**. In view of the different teacher categories in the school and the hours they are each meant to work, we also know that a given number of hours could be delivered: this is the **theoretical teaching time**.

The graphic representation on the left shows the coherence between the two when supply teachers are included in the analysis while the one on the right shows the situation without supply teachers. In general, a growing relationship is indeed observed, illustrating that, on average, the theoretical number of hours delivered by teachers increases with the theoretical number of hours needed; however, there is also seen to be some dispersion around the average relationship demonstrated by an R^2 of 91.6%, i.e. a randomness of 8,4% in teacher allocation. So, for schools needing a total of 1500 hours each, some will theoretically be able to deliver 500 hours and others 2 to 3 times more. The randomness in teacher allocation would incidentally have been four times higher if it were not for supply teachers (cf. graph on the right, R^2 = 75.5% so randomness = 24.5%). Finally, it should be noted that practically all schools are under the line of perfect equality between theoretical teaching time and theoretical instructional time. Contrary to the situation observed in primary education, **no secondary school demonstrates surplus offer compared to the required number of hours**. Randomness arises here primarily from a lack of teachers in posts in secondary schools.

Graph 2.1: Relationship between teaching time and instructional time in public general secondary schools (Benin)

Relationship between theoretical instructional time and theoretical teaching time (with supply teachers)

y = 0,796x + 15,36
R² = 0,916

Relationship between theoretical instructional time and theoretical teaching time (without supply teachers)

y = 0,499x - 36,64
R² = 0,755
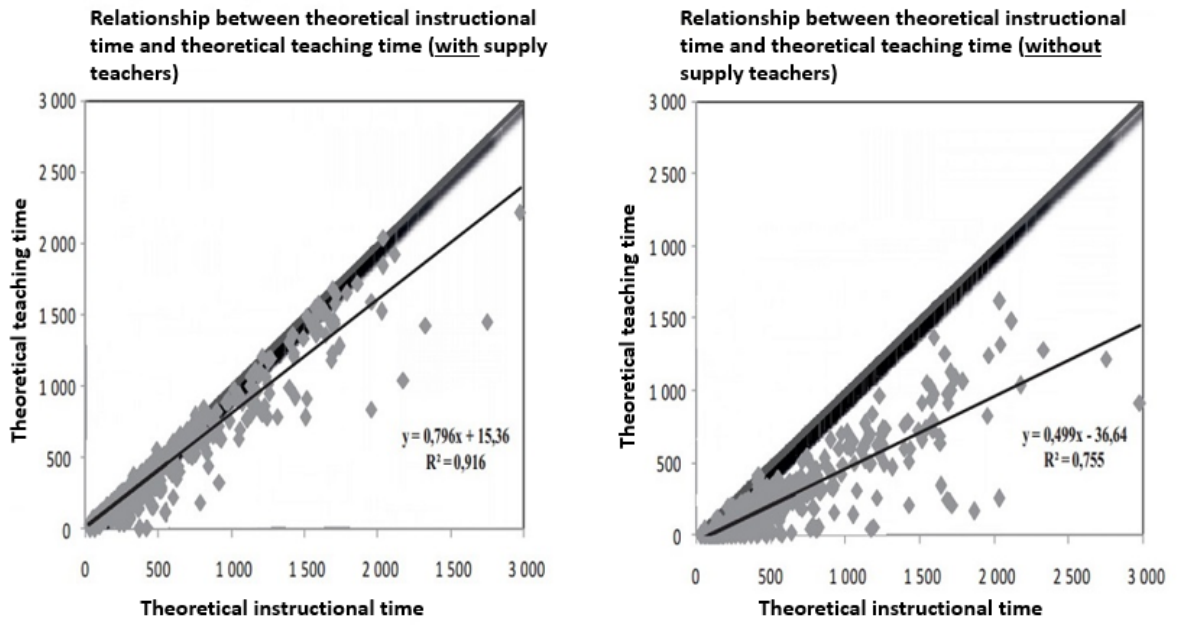
Graph based on DPP-MESFTP database, 2008/09
Source: UNESCO-Pôle de Dakar-IIPE, 2011

Questions for individual consideration

It is important for you to have fully understood the determination coefficient (R^2) since you will have to calculate it in the group exercise. To be sure you understand this indicator properly, practise with the question for consideration below. If you have any doubts, please do not hesitate to ask for clarifications via the learning platform.

To do so:

1. Begin by reading some explanations on the visual representation of this indicator. They will help you to apprehend it better.
2. Then, answer the questions regarding the case of Togo.

Visual representation of the determination coefficient (R^2)

Alain Mingat suggests a visual representation of the selected indicator in order to measure the different levels of randomness in teacher allocation and to get a more concrete idea of its scale (graphs 2.2 and 2.3). Indeed, the visual representation through a cloud of dots is the easiest way to apprehend this indicator, which can be difficult to understand.

In graphs 2.2 and 2.3 below, each letter (or dot) represents a school. It is positioned on the horizontal axis (x) according to the number of pupils in the school and on the vertical axis (y) according to the number of teachers in the school. As such, these graphs relate school size to teacher allocation.

If we were to draw a straight line to represent the general trend observed in the schools in São Tome and Principe, we would notice that most of the dots on the graph would be close to that line. In statistical terms, that straight line is called the linear regression line. However, the same exercise for graph 2.3 would show a pattern of much more scattered dots, above and below the straight line. The further the dots are from the straight line, the greater the incoherence in the relationship between school size and teacher allocation. Indeed, the straight line indicates the expected relationship between the number of pupils and the number of teachers. It identifies the number of schools deviating from the latter as well as the amplitude of deviation.

Graph 2.2: Number of pupils and teachers in primary schools in São Tome and Principe

Percentage of randomness: 3 %

Number of teachers

```
16                                                        A   A
15
14                                        A           AA
13                                        A A       AA
12                              A    B     A
11                           A      A       A
10
 9                 A   A      A
 8            A     A    AAB
 7            A   A    A
 6          A AA
 5      A        AA
 4    AB  CBAA  A
 3    A AAAB
 2  AAB  B
 1  A BBA  A
   └──────────────────────────────────────────────────────
   0      100      200      300      400      500      600
```
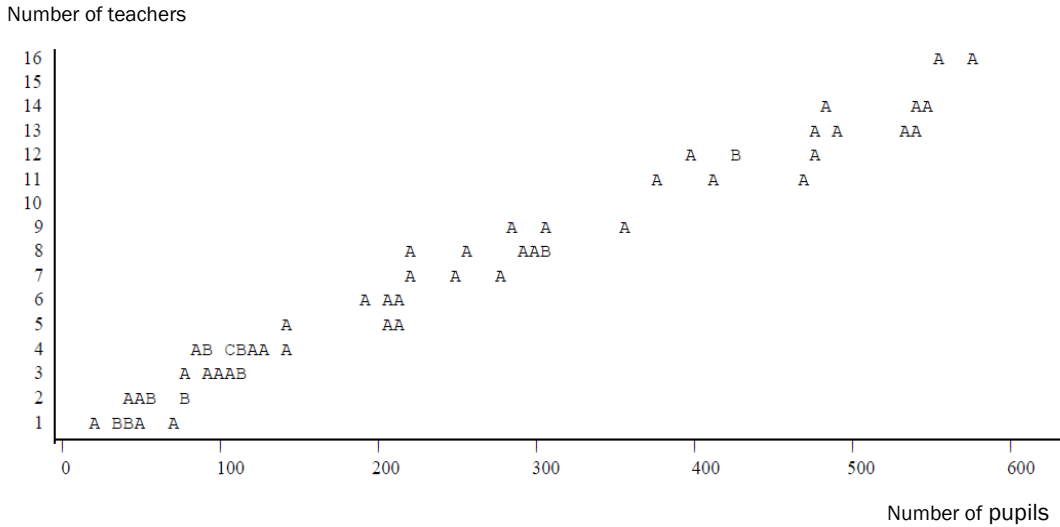
Number of pupils

Graph 2.3: Number of pupils and teachers in primary schools in Benin

Percentage of randomness: 39 %

Number of teachers

```
12                                        A
11                   A     A         A
10            A   B A BABA BA  AC  AA
 9            AA    BBDD BADB  A AAA AAAA   A B      A              A
 8         A BABBEBBDFCDBCEBECAEBB C DCBC C BBA    ABA    A          A
 7     A   BB BGFEGDEFJNRSPPQNJRNOIJCJFHKFFBADEDDBBBA BAA   A  AA      A
 6     A   AA EEFKLLNMQZZZZZZZZZZZZZZZZRQQKHJIODHGDDA A   AA A
 5       AAB BGKEGIILGOVORWTYUKTUQJQJORMHFGEDDDAECAA A       A
 4    AA ADDDDOKJXLWSKPSSJIHIJGFCHDHECJBFACDDAAABA  A
 3    ADDRWZZZZZZZZZSZTVIOPDJEDDDAB AAAAB      A      A
 2    IITXZZZZZZZZZYZOIGFCHABBCBA       B   A
 1  BAFRZZZZZXSLRKGBAABCEBAA
   └──────────────────────────────────────────────────────────
   0    100   200   300   400   500   600   700   800
```

Number of pupils

Note: In graphs 2.2 and 2.3, each letter (A, B, C...) represents a number of schools: A is for 1 school, B for 2 schools...Z for 26 schools

Source: Mingat, 2003

The case of Togo

The case of Togo presented in the graph hereunder illustrates a situation found in many African countries (Brossard et al., 2006). The graph below presents teacher allocation in public primary schools.

- On the whole do you note a positive relationship between the number of pupils and the number of teachers assigned to the schools?
- Do you note that schools with the same number of pupils have a highly variable number of teachers (e.g. among medium-sized schools of around 300 pupils)? What does this situation mean to you?
- The data on the graph informs us that the coefficient R^2 registers at only 0.63 for the country as a whole. What does that mean?
- Based on the R^2, can you determine the degree of randomness in teacher allocation? What does that degree of randomness signify?:

Graph 2.4: Teacher allocation to public primary schools in Togo in 2003/2004

$$y = 0{,}0154x + 1{,}9467$$
$$R^2 = 0{,}6256$$
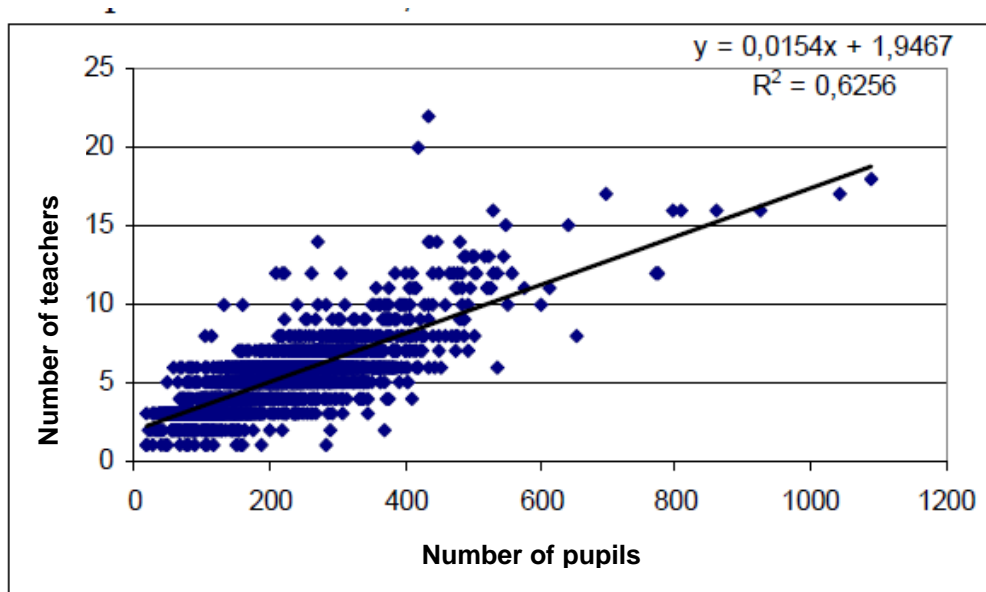
Source: Brossard et al, 2006.

Highlights

- The PTR and the R^2 enable an appreciation of the situation in terms of allocation but do not provide information on the causes. Following the statistical interpretation, complementary surveys or studies will be needed in order to understand what the obstacles are.

- The indicator R^2 is to be used with care. In absolute terms, its national (or regional) average value does not indicate to what extent the country's, or the region's, schools are characterised by an over-allocation or rather an under-allocation of teachers. It is necessary to analyse the graphs showing the dispersions per school in both directions. The cloud of dots enables easy identification of the schools where the problem is more critical (those that are seriously understaffed or, on the contrary, those that have far too many teachers compared to the number of pupils). It will then be possible to recommend the redeployment or reallocation of teachers between schools.

- Several indicators are needed to carry out a relevant diagnosis. It is not enough to analyse only those indicators that measure teacher deployment numerically (i.e. according to the number of teachers). It is imperative to take qualitative factors into account (seniority, qualifications, gender, etc.). The PTR and the R^2 can then be developed or be interpreted in relationship to other indicators (% qualified teachers, % female teachers, etc.).

- Moreover, the actual possibilities of reducing the degree of randomness can only be appreciated by taking into account the characteristics of the specific context (the country's topography, which may require a high proportion of small schools and so under-average PTRs, for example) and of the existing policy (schooling policy in rural areas; servicing of remote areas, etc.).

Part 3. Principal factors contributing to problems of allocation

After detecting dysfunctions in staff deployment, with the aid of indicators such as the PTR and the degree of coherence, the causes of the problem have to be identified in order to address the different issues adequately. While identifying imbalances in deployment appeared to be fairly simple, analysing the causes proves to be more delicate since the analysis must be **multifactorial**. The reading grid below will enable you to explore the different factors that can have a negative influence on the equitable and effective distribution of teachers throughout the territory. These factors may be combined differently depending on the country and consequently lead to a specific response adapted to the situation of each country. Possible responses are to be found in the last part of the module (« Strategies »).

The factors at the root of the dysfunctions observed can be grouped as follows:

- **Institutional and organisational factors:** existence or absence of adapted allocation rules and procedures and of institutions and functional management tools ensuring their application, etc.

- **Individual and environment-related factors (socio-cultural, political ...):** teachers' individual preferences and the interests of some politicians and administrators involved in the allocation process; social customs or norms coming up against allocation criteria, etc.

3.1 Reflection on institutional and organisational factors

Among the major institutional or organisational factors (tackled in more detail in modules 5 and 7) influencing allocation, the following are of particular note:

- o the *legal and regulatory framework*: allocation behaviour that deviates from the rules is encouraged by an obscure or incoherent regulatory framework and by a nonfunctional individual recourse device in case of failure to respect the rules; complex allocation procedures or ones that do not point out clear decisional responsibilities also leave some leeway for political interventions and behaviour departing from the rules ; finally, an appropriate legal framework is only effective if there is also a functional device to ensure its application.

- o *management tools*: a staff file and an information system for management of the education sector providing comprehensive reliable information on teachers and their allocation create the necessary transparency for rational allocation decisions and tend to limit off-track allocation behaviour (by both teachers and managers). This contributes to rationalising the management of human resources in general, and their allocation in particular.

- o A functional system of *social dialogue*: in the field of allocations as in other fields of teacher management, a functional and representative device for dialogue and negotiation between the government and teacher representatives fosters the implementation of a duly respected regulatory framework and limits the objections to management decisions.

o *management personnel trained in human resources management* and guided by a *Code of conduct*: Yet too often, the personnel in charge of teacher management has not been trained for the job entailing errors and inefficiency. Beyond training and the imposed regulatory framework, management behaviour can also be influenced by the Code of conduct that the profession (here, the teachers and/or their managers) has drawn up and is responsible for self-managing.

3.2 Reflection on individual and environment-related factors

Among the factors influencing teacher allocation and which do not fall directly under the institutional and management framework, the following are particularly significant:

o Individual preference, for staying in an urban area for example : Teachers will more likely choose a post in an urban area, especially when their level of salary is fairly modest comparatively speaking, because there are more possibilities of having a complementary activity and income (private tuition, etc.) in these areas. There are also better possibilities of career progression (information on/access to information on training; more frequent inspections, ...).

Moreover, as the payment of salaries is often delayed in remote areas, it is sometimes difficult for teachers assigned there to make a decent living from their teaching job.

Box 3.1: Example of the impact of late payment of salaries in rural areas

> Going to get one's salary in the district offices in rural areas in **Zambia** can cost half the salary in transport and accommodation costs every month (Bennell and Akyeampong, 2007).

o Social environment: Female teachers are often more reticent to accept posts in rural areas. Not only individual interest but also social customs and norms are generally obstacles to the assignment of a woman to a place far from her husband or her family. In addition, the risks of insecurity and isolation in an unfamiliar environment tend to be greater in the case of female teachers.

These factors are not easy to change or to compensate for and must therefore be taken into account when devising strategies to be implemented in order to make up for the lack of female teachers in rural areas, particularly in view of the negative impact this has on the enrolment of girls in these areas.

o 'Political' intervention: Clientelism by political decision makers (at national or local level) can support and foster allocation decisions or off-track behaviour that goes against rational teacher allocation. This is a virtually universal phenomenon ; however, the scale of it varies considerably from one country to another. It is very limited where the information that management decisions are based on is transparent and easy to access and where control and individual recourse procedures are functional in case of failure to respect the rules.

o Cultural factors: Depending on the educational policy and strategies adopted, teacher allocation can aim to take into account a number of cultural factors such as local languages for example, ethnicity and/or the pupils'/populations' and the teachers'

religion. Nevertheless, in practice, these factors have proved to considerably complicate the (already demanding) task of rational and equitable teacher allocation.

Box 3.2: Examples of the challenge of optimal teacher assignment

In **Uganda** and **Zambia**, the share of female teachers in urban primary schools is around 60%, while it varies from 15 to 35% in rural areas (Mulkeen, 2009).

A study on female teachers in 10 regions in **Ruanda** shows that only 10% of primary school teachers are female in the region of Burera, compared to 67% in the region of Gisagara (Bennell and Ntagaramba, 2008).

In **Sudan**, it is rare to find suitable accommodation in rural areas, and married female teachers must be deployed where their husband lives. As 67% of primary school teachers are women, this reduces the pool of available teachers for rural areas (World Bank, 2012b).

In **Malawi**, a female teacher can ask to be sent to another district in order to follow her husband and that cannot be refused her, wherever he might live (World Bank, 2010a).

Source: UNESCO, 2014

Highlights

Over and above school size and structure, diverse factors can promote or contribute to sub-optimal teacher allocation, particularly :

- factors related to the institutional and regulatory framework and to HR organisation ; and
- factors related to individuals (teachers) and to the (socio-cultural…) environment playing a role in the functioning of the education system.

In order to rectify poor teacher allocation, it is useful to analyse the relationship between the situation diagnosed and those factors, and their interaction.

Part 4. Diagnosing teacher utilisation

Optimal utilisation of the pool of teachers constitutes a key objective of HRM in the education sector, especially in contexts where the rapid expansion in the number of teachers causes budgetary or other problems. Indeed, ineffective teacher utilisation leads to recruiting new teachers, which entails additional costs.

As presented above, teacher utilisation will be approached here more specifically from two angles:

- The statutory working hours demanded of teachers, and
- The correspondence between statutory working hours of teachers and teaching time to be delivered to pupils in the schools.

4.1 Statutory working hours

The number of teachers required in order to offer basic education to all, and consequently teacher salary costs, also depend on the way that existing teachers are 'used'. What are the possibilities of savings through a more rational 'utilisation' of teaching staff in sub-Saharan African countries for example where the needs are greatest in the coming years? In this respect, it is interesting to cast a comparative glance at the norms governing **working hours** and teacher allocation in different countries throughout the world, and also at the realities of allocation and utilisation.

The Fast Track Initiative has set a **pupil-teacher ratio** of 40/1 for those countries still to reach Education for All (EFA) and aspiring to accelerate progress towards achieving that goal by 2015. Well, this ratio, considered by many teachers as very high and a challenge to teacher effectiveness, is in reality much higher in most sub-Saharan African countries. In those countries, the average primary school pupil-teacher ratio was 43 in 2011 and even over 50 in many countries, such as Chad, Mozambique, Ethiopia, Malawi and Zambia (UNESCO, 2011). In this part of the world, it does not seem possible therefore to save on expenditure by raising even further the average number of pupils per teacher.

A comparison of the options adopted by different countries in terms of the total number of **working hours** demanded of teachers seems to offer a more promising possibility. Data collected by the UNESCO Institute for Statistics (UIS) show a clear difference in this respect between industrialised and low-income countries, especially African countries. Moreover, there are huge disparities in official working hours between the different African countries. This reflects political choices impacting *de facto* the education budget. Countries where the number of official working hours is low will have to recruit more teachers than countries where it is higher, in order to ensure an equivalent number of classes (with comparable class size and subjects taught). The fact that teachers in secondary education generally have fewer working hours than in primary education (to leave them enough time for lesson preparation) and that they teach smaller classes (optional subjects) results in considerable variation between countries. Research conducted in sub-Saharan Africa (SSA) reveals official working hours in lower secondary education ranging from 13.3 hours per week in Uganda to 30 hours in Malawi. In upper secondary education, they vary from 12 hours

in Uganda to 20 hours in Lesotho. Thus, lower secondary teachers have about 20 working hours per week[3] in SSA and upper secondary teachers have less.

While regulations in most European, North American and Asian countries require their teachers to work between 1600 and 1800 hours per annum, those in force in sub-Saharan Africa generally provide for between 800 and 1350 hours per annum, in other words distinctly less. The differences are less striking when referring to what is, strictly speaking, statutory instructional time (contact hours in the classroom) (see UNESCO-UIS, 2006, graph 4.1 below).

Considerable variations can be observed between countries within Africa as far as statutory primary school teaching time is concerned: while a teacher in Uganda is only meant to teach 541 hours per annum, his colleagues in Mali have to deliver 930 hours, and even 1080 hours in Senegal.

The time that teachers are supposed to spend teaching also varies considerably in other parts of the world. In **India, Indonesia** and the **Philippines**, primary school teachers teach over 1000 hours per annum, compared to 656 hours in the **Russian Federation**. Teaching time also varies in these countries according to the level of education. On average, primary school teachers in World Education Indicators (WEI) countries teach longer (868 hours) than their counterparts in lower and upper secondary education (848 and 860 hours respectively).

It is true to say that these variations in official working hours partially conceal variations in instructional time that pupils should receive (according to the official programme) in a year. Graphs 4.1 and 4.2 below reflect the variations in instructional time in secondary education between a number of countries.

Graph 4.1: Statutory teaching hours at lower secondary, 2003
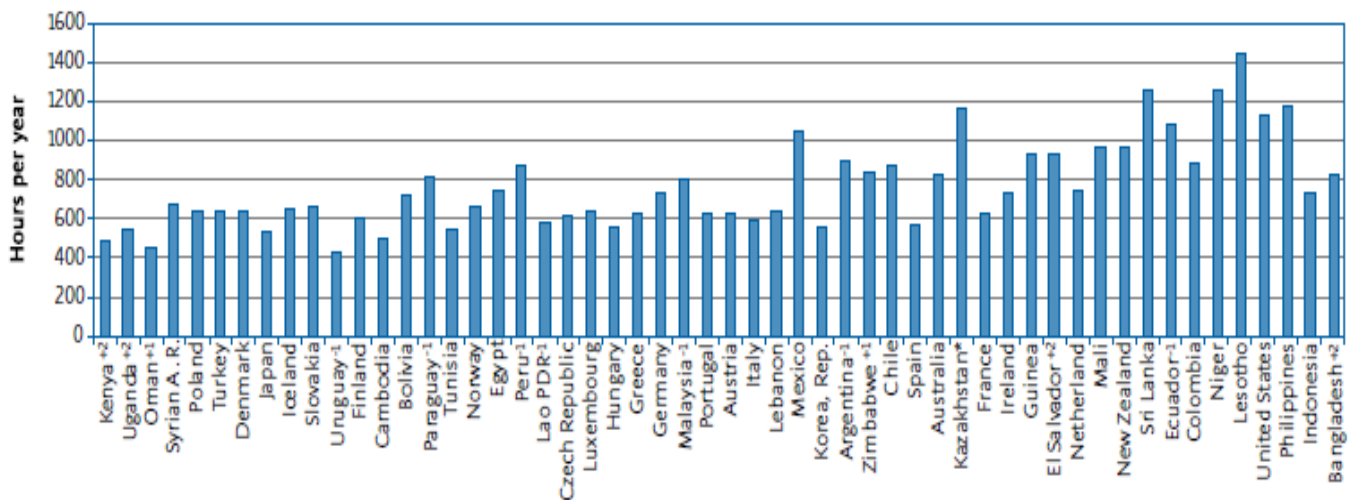
Source: UIS, 2006

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[3] Teachers' working hours correspond both to the time spent teaching in class and to the time spent on preparing lessons, correcting pupils' work and completing administrative tasks connected to their functions. As lesson preparation time is difficult to measure since it varies depending on the teachers, weekly working hours generally refer to teaching time actually delivered to pupils in class.

Graph 4.2: Statutory teaching hours at upper secondary, 2003
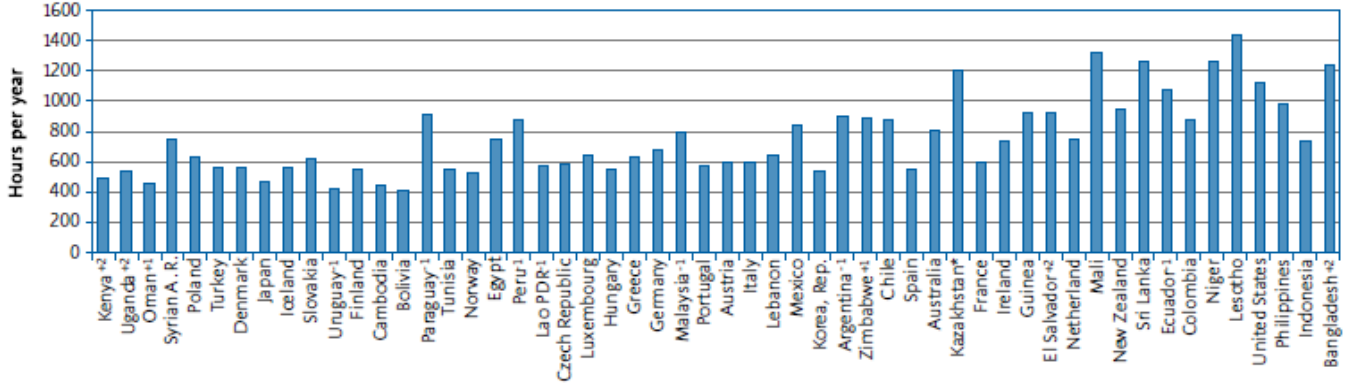
Source: UIS, 2006

Some countries could envisage limiting the recruitment of additional teachers by increasing statutory working hours. Such a measure does not however constitute a panacea. It seems hardly appropriate in a context where teachers' salaries are so low that they cannot make a livelihood and are obliged to find a second source of income, naturally an occupation other than teaching.

Even so, official instructional time is often far from reflecting the actual hours of lessons received by pupils in reality. In this case, increasing the official hours of work could limit the growth in personnel and related expenses but, unless there are changes in behaviour, the problem of actual time and quality of instruction risk deteriorating.

Increasing the weekly working hours of teachers is a way, for the countries wanting to do so, of increasing the annual instructional time for each pupil. However, if accompanying measures (slight salary increases or other compensations; assistance for certain tasks, etc.) are not taken into account, there is a risk that teachers will spend less time preparing lessons, correcting pupils' work, working with other teachers or fulfilling any other administrative or professional activity.

Graph 4.3: Cumulative intended annual instruction time (in hours) for pupils aged 9-14 in public schools, 2005
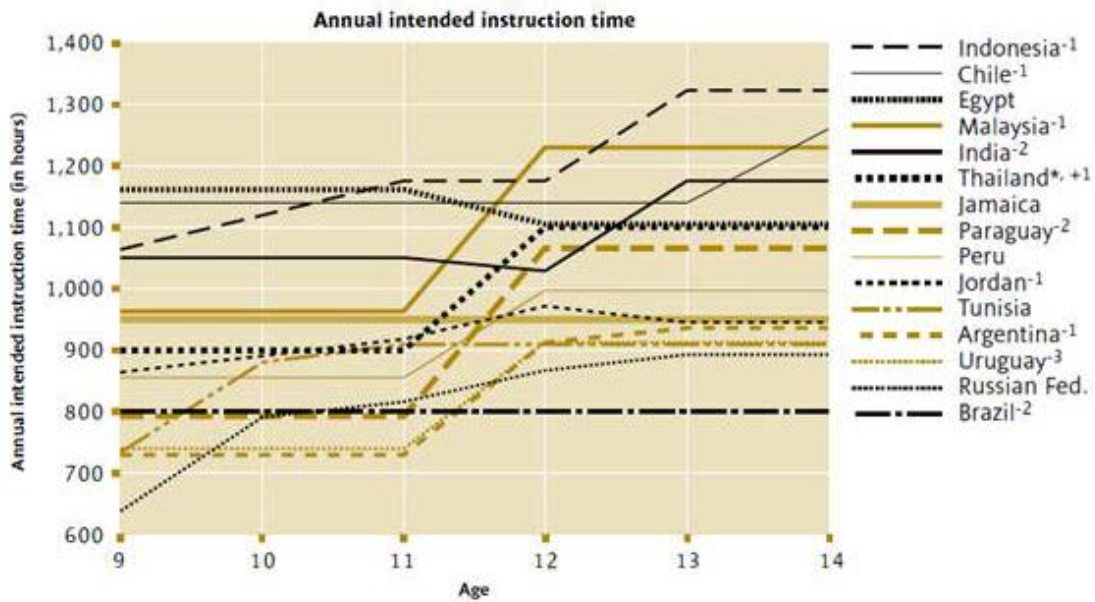
Source: UNESCO-UIS, 2007

4.2 Analysis of the relationship between theoretical working hours of teachers and the number of necessary hours

4.2.1 Theoretical coverage rate

The theoretical coverage rate of the mass of hours required (per geographical sector or per subject taught, for example) is a common indicator for assessing teacher utilisation. This enables the detection of imbalances (regional or per subject matter) and their location, in order to guide decision makers in taking possible corrective measures. The theoretical coverage rate is obtained by simply relating the number of hours theoretically delivered to the number of hours theoretically necessary. Graphs 4.3 and 4.4 provide a visual summary of the theoretical coverage rate of the mass of hours required in secondary education per subject matter and per *département* in Benin[4].

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[4] Taken from: La question enseignante au Bénin : un diagnostic holistique pour la construction d'une politique enseignante consensuelle, soutenable et durable, UNESCO-Pôle de Dakar-IIEP, 2011

Graph 4.4: Theoretical coverage rate of the mass of hours required per subject matter in public general secondary schools (Benin, 2008/09)
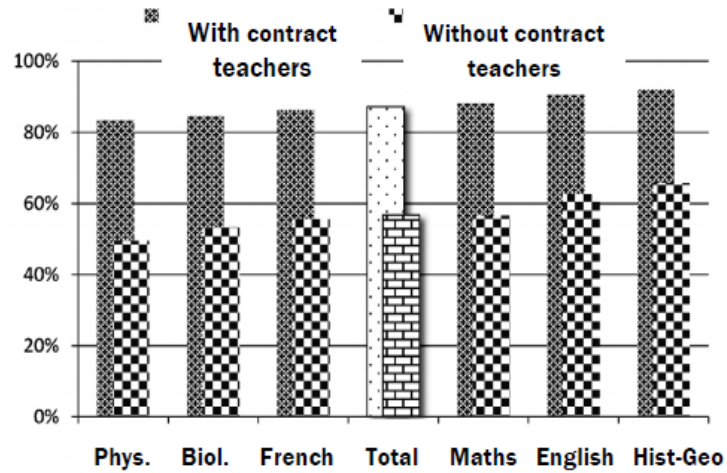
Graph 4.5: Theoretical coverage rate of the mass of hours required per district in public general secondary schools (Benin, 2008/09)
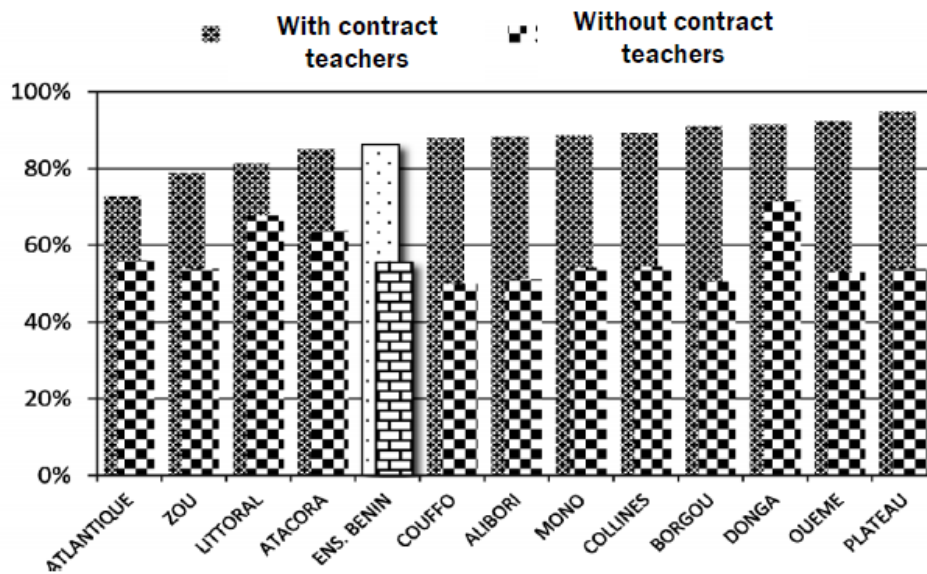
Source for graphs 4.4 and 4.2: UNESCO-Pôle de Dakar-IIPE, 2011

The coverage rate is seen to be around 87% at national level, meaning that 13% of the theoretical mass of hours is not delivered. The latter figure is a « low » estimation of the scale of the shortfall in hours, since it supposes optimal teacher utilisation. This is very often not the case, particularly in upper general secondary education. The accumulation of such a shortfall is detrimental to learning and is therefore undesirable.

4.2.2 Teacher utilisation rate and average working hours

Finally, after determining the theoretical coverage rate of the required mass of hours in secondary education per region and per subject, it is then useful to look at teacher utilisation rate (UR). This indicator measures whether teachers are used optimally. For example, a teacher who receives a timetable of 9 hours per week while the norm stipulates that he/she should deliver 18 hours per week, only delivers half of what is owed. The utilisation rate of this teacher is 50%, thus revealing sub-optimal management.

The UR of teachers as a whole is calculated as follows :

$$UR = \text{given number of hours} / \text{due number of hours}$$

The given number of hours is the acccumulation of the timetables assigned to teachers.
The due number of hours is the accumulation of their working hours if all teachers were to receive the maximum number of working hours according to the norm.

Considering that a rate of 100% corresponds to optimal utilisation, then this translates into a perfect adequation between the number of hours due by teachers (official working hours) and the number of hours actually allocated to them. On the contrary, when teachers do not carry out the official workload, it results in problems of cost effectiveness for the system. The UR can be calculated at national or at school level.

Depending on the country, it can happen that weekly working hours are differentiated according to teacher category. For example, lower secondary teachers have higher working hours than upper secondary teachers (22 hours compared to 18 hours). It is not unusual to find these two teacher categories in the teaching staff of a same school. What weekly hours should be used to calculate the number of hours due ? This dificulty can be overcome by calculating the average number of hours according to teacher categories in order to obtain the average number of hours due by a teacher (i.e. 22h + 18h = 20h).

Another indicator is that of Average Working Hours (AWH). The average working hours (AWH) of a teacher are defined as being the relationship between the weekly number of hours actually allocated to teachers and the number of teachers. The AWH varies from one school to another according to the number of classes, and within schools and across subjects.

$$AWH = \text{number of hours per week actually delivered} / \text{number of teachers}$$

The example below illustrates the question of teachers' UR and AWH overall and per subject matter.

Box 4.1: Assessment of average working hours (AWH) and utilisation rate (UR) in Morocco

The study conducted by Tazi (2005) looks at the AWH for six subject matters: generalised subjects with a high number of hours (Arabic, French and mathematics) as well as history-geography (H-G), Islamic education and physical education and sport (PES). There were 41 121 teachers for these six subjects, i.e. 76.13% of the total number of teachers.

In the example, the AWH per teacher, all subjects combined, are 20.92 hours. However, this average conceals some disparities. In fact, 61.39% of teachers actually work 24 hours, while 1.04% of them have no classes (potential reserves). The remaining 37.57% have AWH of 16 and a half hours per week.

The study thus revealed that in 2002-2003, 559 secondary school teachers (1%) had not been assigned timetables, and 20 293 (37.6%) had teaching hours of 16.5 hours per week, instead of the expected official 24 hours. Only 61.4% (33 160) of teachers had been assigned teaching hours of 24 hours corresponding to official working hours. That represents an effective loss of 6 900 teachers for the secondary education system.

- Teacher utilisation rate (UR)

The number of hours to be delivered by the 54 012 teachers according to official working hours (24 hours per week) is 1 296 288 hours. Related to the number of hours delivered, that corresponds to a utilisation rate of 87.16%. This is equivalent to a total loss of 156 322 hours.

Table 4.1: Average working hours, teacher utilisation rate in secondary education (Morocco)

	Maths	Arabic	French	H-G	Islamic education	PES	Total 6 subjects	Total all subjects
Number of hours delivered	197 952	197 952	197 952	98 976	65 984	65 984	824 800	1 129 909*
Number of teachers	9 379	9 203	9 227	4 832	3 166	5 314	41 121	54012
Average working hours	21.11h	21.51h	21.45h	20.48h	20.84h	12.42h	19.635	20.92h
Utilisation rate	87.9%	89.6%	89.4%	85.35%	86.84%	51.7%	83.6%	87.16%

(*) : The workload actually carried out at national level is taken from the annual survey conducted by the DSEP/MEN in 2002/2003.

In other words, an under-utilisation rate (UUR) of 12.84% is registered for secondary school teachers, since :

UUR = 100% -UR

Moreover, the teacher UR is the highest for subjects with a high number of hours (Arabic, French, mathematics). In this respect, teachers of Arabic are used the most since their UUR is only 10.4%.

Few studies have examined actual teacher UUR in secondary education per subject and by geographical area. The study by Tazi (2005, p. 73) reveals a much greater under-utilisation in urban areas as opposed to rural areas, probably due to over-supply. On the basis of five subjects, he calculated under-utilisation at 11.36% in urban areas compared to 2.10% in rural areas. This

shows that teachers in urban areas do not have a full workload, probably due to over-supply and low turnover (post stability). Whereas, the situation in rural areas is probably a matter of staff shortage, with teachers teaching over the norm, frequent turnover and requests for transfer.

Source: (Tazi, 2005: p 73)

☰ Highlights

- In primary school education, teacher utilisation is generally calculated approximately using the teacher-class ratio, supposing that a teacher has a class and teaches all subjects to that class. If reality is far removed from this model (if specific subjects are taught by specialised teachers; taking into account the head teacher's partial release from teaching, etc.), it may be relevant to consider the analysis indicated for secondary education.

- In order to carry out a diagnosis of teacher utilisation in secondary education, it is appropriate to establish the relationship between the official working hours demanded of teachers (sometimes depending on a number of criteria such as the level of education – lower or upper secondary, for example, support functions that the teachers fulfil aside from teaching, etc.) on the one hand, and the working hours required of the teachers in their school (utilisation rate) on the other hand. Teacher absenteeism is not part of the calculation of teacher utilisation.

- It is interesting to calculate and analyse the utilisation rate per geographical entity (region*;* urban or rural areas, ...) and per subject matter taught, and possibly per type of school (private or public, for example) in order to have a finer view of the under-utilisation and over-utilisation phenomena of teaching staff, and enable an appropriate improvement strategy to be drawn up.

- Beyond establishing a better balance in teacher utilisation across the country's schools, those in charge of educational policy may also wish to evaluate whether the workload demanded of the country's teachers is appropriate. In that case, it may be useful to make a detailed analysis of their working hours, broken down into teaching time and time spent on other activities, as well as a comparison of teachers' working hours with those of other professions in the same country, and/or with those of teachers in other countries.

Part 5. Main factors contributing to utilisation problems

Regarding the factors contributing to sub-optimal teacher utilisation, the analysis of eight countries conducted by Mulkeen (2010) reveals that the recruitment of additional staff paid by the community could exacerbate the phenomenon of surplus teaching staff in some schools, just like the pedagogical organisation of schools, teacher specialisation and the regulations on teachers' official working hours.

"Actual utilisation was often lower, particularly in schools with excess staff, either as a result of failures of deployment systems or because of recruitment of additional staff paid by the community. Teacher utilisation was generally poorly regulated, and in some countries the expected working hours were not well known.» (Mulkeen, 2010, p. 61).

5.1 Phenomenon of 'out of classroom' teachers

Pursuing the optimisation of qualified teacher utilisation also involves exploring the phenomenon of teachers who occupy non-teaching jobs. So, in an attempt to rectify disparities in teacher supply and to use available qualified staff more effectively, some countries have diagnosed the number and characteristics of the teachers in administrative posts, with a view to their redeployment to classrooms, i.e. teachers in the Ministries or decentralised departments or those « doubling up » (i.e. sharing a single class of pupils with another colleague – a phenomenon observed in urban areas).

In a context where qualified, experienced teachers are in scarce supply, it is common to find them in management positions within schools, such as head teacher, assistant or head of department. When occupying these positions, they are not called upon to teach as much as their less-qualified colleagues. Nevertheless, in most education systems in developing countries, where school management personnel are not even involved in nominating staff, drawing up the curriculum or controlling the budget, their administrative function provides them with few challenges and consists mainly in routine tasks such as chasing up overdue tuition fees, which could be handled, as appropriate, by less qualified staff. Relieving management positions of these administrative tasks, which would be entrusted to administrative assistants, would free up teaching time for these experienced teachers, at least for small schools that are often less well endowed in teachers (Thompson, 1995, p. 21).

However, this cannot be envisaged as an overall solution but rather as an *ad hoc* response to a shortage of qualified teachers, in rural schools for example. Indeed, studies have shown that effective teacher utilisation, at school level, depends a lot on the head teachers' managerial and supervisory capacities and, consequently, on having received adequate training in terms of personnel management and implementation of norms and procedures. In other words, teacher utilisation could be optimised by improving the professional skills of personnel running each school. It would thus be more appropriate to create posts for experienced teachers to provide support to beginning teachers, and reserve management positions for personnel specifically trained for the job.

5.2 Pedagogical organisation of schools

It is worth recalling that teacher utilisation partly depends on the school's pedagogical structure. Indeed, the pedagogical structure of a portion of schools does not always allow for rational teacher utilisation in all subjects. In other words, some teachers are not fully 'used' due to the fact that school size or structure (incomplete level; provision of a variety of specialised sections/options, etc.) does not enable each teacher to be assigned the official 24 hours per week. This situation leads to under-utilisation or what is also defined as **structural under-utilisation** (Tazi, 2005).

5.3 Management behaviour and regulations

There are also schools where teacher under-utilisation cannot be explained by structural factors. Logically, the phenomenon therefore results from erroneous (intentional or through lack of competence) management behaviour (assignment, transfer). A situation of surplus staff, where redeployment would not disrupt school operation, creates under-utilisation (called **actual under-utilisation**).

Box 5.1: Examples of mismanagement resulting in teacher under-utilisation

In **Malawi**, poor deployment practices had resulted in overstaffing in some urban and periurban schools, leading to a practice of « shared teaching » or the assignment of more than one teacher to a primary school class. Pupils in a single class had one teacher in the morning and another in the afternoon for example, which amounted to using teachers for only 50% of their official working hours. In some cases, this was driven by a shortage of classrooms but, in other cases, teachers had amalgamated classes in order to reduce their workload.

In **Lesotho**, teachers were assigned according to the procedure in force but there were schools where a shortage of classrooms resulted in very large classes, with two teachers assigned to some classes. As in Malawi, that resulted in shorter teaching hours, as the workload was shared between the two teachers. Teacher workloads were also reduced by the presence of additional teachers paid from school funds.

In **Uganda**, secondary schools charged fees and used part of these funds to hire additional « off-payroll » teachers. While these were intended to supplement the teaching staff, they also allowed some teachers to have reduced workloads.

Source: Mulkeen, 2010, 64.

Aside from « irrational » management behaviour, the regulatory framework governing teacher employement and assignment can also contribute to sub-optimal teacher utilisation.

In Morocco (as in many other countries), full utilisation of a teacher's official working hours is hampered by another rule stipulating that *a teacher cannot be requested to complete his/her teaching load in another nearby school where there is a shortage in that subject, even if he/she is under-utilised in the school where he/she has been assigned.*

5.4 Specialisation

Subject specialisation, usually a characteristic of secondary teachers, presents a particular challenge for optimal utilisation of teaching staff. It is no longer a case of managing the shortage of teachers as a whole but for each subject matter. Indeed, while a primary school teacher is versatile and has to teach all subjects on the programme for the same class, secondary teachers have a more or less pronounced subject specialisation. Research conducted on this topic in sub-

Saharan African countries indicate that teachers have to specialise in two subjects; nevertheless, in some cases, they are only specialised in one.

Single-subject specialisation can have its advantages, especially in highly populated areas. The teacher has to focus on a single subject, which may enhance his/her effectiveness and so be conducive to pupil learning. However, managers may see single-subject specialisation as a source of waste of teaching resources, especially in the case of low-enrolment schools in remote rural areas (K. Segniagbeto, 2011). In other words, in small schools, teacher specialisation may represent an obstacle to optimal teacher utilisation for want of a sufficient number of classes to enable the teacher fulfil his/her official working hours. This is particularly true for teachers of unpopular optional subjects.

In **Morocco**, for example, the principle of secondary teachers specialising in a single subject is a significant obstacle for the effective utilisation of resources. As such, managers and school heads cannot oblige a teacher to complete his/her teaching load by giving lessons in a subject similar to their specialist subject.

One study (Tazi 2005) brought to light that in Morocco, over one out of three lower secondary teachers are under-utilised. At the same time, in some schools some subjects cannot be taught to all pupils. Although requiring considerable pre-service and continuing training, greater teacher versatility would facilitate optimal utilisation of available teacher supply, especially in small secondary schools in rural areas.

In contrast, due to the shortage of teachers, teachers of core subjects and of subjects in high demand often find themselves with heavier workloads than the other teachers. Research conducted in Uganda, Lesotho and Malawi revealed that mathematics and science teachers had more hours of lessons than other teachers, and sometimes more than official requirements. In Ghana, 20 percent of teachers were overextended teaching 25 to 30 periods per week, while 40 percent taught less than 18 periods (Mulkeen 2010, p. 66).

5.5 Erosion of actual working time due to strikes and other events

Actual teaching hours are sometimes shorter than the official figures. Teaching hours can be eroded by strikes or other unrecorded events such as late starts to term or unscheduled school closures. This aspect of imperfect teacher utilisation is not looked at in depth here (nor is the phenomenon of teacher absenteeism).

☰ Highlights

Sub-optimal teacher utilisation is facilitated by a number of factors that should be taken into account in order to introduce appropriate improvements, particularly:

. Assigning teachers to non-teaching posts: when this phenomenon reaches a significant level, the teaching force is eroded regularly, which is contrary to optimal utilisation.

- Regulations preventing flexibility in teacher utilisation: if the regulatory framework prohibits the employment of a teacher in two or several schools to reach full-time employment, this necessarily results in sub-optimal teacher utilisation in all contexts involving small schools.

- Teachers specialised in a single subject: narrow specialisation constitutes an additional source of restriction to optimal teacher utilisation.

- Some forms of management behaviour ('exceptional' transfers or assignments; unequal distribution of responsibilities within the school, errors in determining the needs for teachers in the school based on 'erroneous' data, etc.) can also contribute to sub-optimal teacher utilisation. These forms of behaviour raise the question of the training and tools received by managers in order to do their job, but also that of the regulatory framework and other mechanisms that could encourage them to do their job correctly (or at least dissuade them from doing a poor job).

Part 6. Some management measures with a view to improvement

The previous parts of this document have demonstrated the complexity of the issue of effective teacher allocation and utilisation. Multiple factors interact to generate the quantitative and qualitative imbalances observed in a given context.

The improvement strategies presented below are also cumulative and should vary according to the specific situation of each country. Nevertheless, they all aim to reduce the gap between those areas and schools that are over-endowed in teachers and those that are under-endowed.

They are broken down into two categories here: strategies aimed at *quantitative* rebalancing and those aimed at *qualitative* rebalancing. Before discussing these strategies, let us look briefly at the different (more or less centralised) regulation models that can govern education sector management, and which must be taken into account when choosing strategies for better teacher allocation and utilisation.

6.1 Impact of the management model on teacher allocation

There are three main management models, which tend to have somewhat different consequeces on teacher allocation :

- The centralised model

This generally corresponds to a tiered assignment system: from national to regional and/or *département* level, followed by deployment to schools. It is usually effective when supported by a reliable information system or a post-based management system, that is to say when schools have a number of posts defined either in relationship to the number of classes or to the pupil-teacher ratio.

Conversely, it can be ineffective in the absence of an adequate information system, which automatically limits control and reactivity.

- The devolved or decentralised model

This model enables decentralised or local administration to hire teaching staff in line with specific needs. More particularly, local recruitment enables targeting of applicants according to their capacity to teach in the local language, which is often lacking when recruitment takes place at national level. While having the advantage of accelerating the recruitment process and better addressing local needs, it can be revealed ineffective when decentralised and/or local administration does not have the qualified personnel to implement deployment and when there are no safeguards in place to avoid abuse.

The proximity of local political leaders may also foster the phenomenon of clientelism or even political interference in recruitment and assignment/transfer decisions and thus contribute to sub-optimal utilisation, for example.

- The market system

With this model, teachers apply for vacant positions advertised and filled by the school but on government financing. It has the advantage of enabling the recruitment of teachers wishing to teach

in a given school and who, as a result, are not going to abandon their post afterwards. Moreover, it does not involve heavy management procedures (that tend to exist in the central model).

Even so, as in the case of local or decentralised/devolved recruitment, the hiring process can be hampered by influential local personalities putting pressure on the school's recruitment committee, which leads to the latter not always choosing the most qualified teachers. In addition, this model tends to foster growing qualitative disparities in teacher distribution, with some schools consolidating and strengthening their attractivity to the detriment of others.

Thus, for it to be effective, any system must set up transparent recruitment procedures and offer incentives or compensation to enable 'less well-off' schools attract and retain quality applicants and subsequently keep them in their posts.

6.2 Strategy for creating a better quantitative balance

- Offering incentives to attract and retain the best teachers

One way to ensure teacher deployment to disadvantaged (usually rural) areas is to offer incentives. These may take the form of **official accommodation**, appropriate **sanitation** in school, **financial incentives** (bonus, child allowance, mobility allowance), faster promotion or else covering of training expenses as is the case in Afghanistan. Some incentives specifically target women who, as mentioned previously, are often more reticent to go to difficult areas, reducing all the more the positive impact on the enrolment of girls in these areas. Others are targeted towards certain deficit subjects in order to encourage scientific vocations, such as in Liberia which hopes in this way to offer more teaching of science in order then to distribute science teachers more equitably throughout the territory.

Box 6.1: Example of quantitative rebalancing strategies - housing

Nigeria offers those teachers deployed to disadvantaged areas a promotion.

Afghanistan has adopted housing measures for female teachers, as well as training programmes intended for female teachers in remote areas where qualifications are lacking.

Table 6.1 sets out existing incentive measures, per type of reason, in the perspective of an international comparison without actually breaking down the data according to professional status[5]. However, it is well known that incentive measures do not usually concern contract and community teachers.

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[5] Methodological guide for the analysis of teacher issues (TTISSA), UNESCO, January 2010

Table 6.1: Bonuses and benefits for primary teachers – international comparaison

Country	Management responsibilities	Teaching more classes or hours than required by a full-time contract	Location allowances (e.g., isolation pay, housing allowance, or provision of housing)	Age (independent of years of teaching experience)	Outstanding performance in teaching	Outstanding performance of students
Burkina Faso	M	N	M	N	N	O
Chad	N	N	N	N	N	N
Guinea	M	N	M	N	r	r
Kenya	M	N	M	r	r	r
Lesotho	N	N	M	N	N	N
Mali	M	N	M	N	N	N
Niger	M	N	M	N	N	N
Senegal	M	M	M	N	N	N
Uganda	...	...	...	...	...	...
Zimbabwe	N	N	M	N	N	N

M: most of the time; O: occasionally; r: rarely; N: never; ...: missing data

Source: UNESCO, 2010 (UIS database)

Financial measures must be substantial To have a real impact on teacher motivation for working in disadvantaged areas, in order to compensate for the difficulties of living in remote areas.

Box 6.2: Examples of quantitative rebalancing strategies – financial incentives

In **Cambodia,** a teacher pay increase of 12.5 to 15 US dollars per month, i.e. approximately 16% more, had only limited success given the low basic wage and the few opportunities of finding supplementary sources of income in remote areas (Steiner-Lhamsi and Kunje, 2011).

Gambia adopted a more promising policy with qualified teachers receiving a very high hardship allowance, representing 30% to 40% of the basic wage for posts in some remote areas, in schools more than 3km from a main road. The measure was significant enough to modify teachers' attitudes: in 2007, 24% of teachers in the regions where this incentive had been introduced had requested a transfer to hardship schools (Mulkeen, 2010).

So, for them to be effective, incentive measures should represent a substantial share of the teacher's total income and target the most difficult areas; or else, have an effect upon the teacher's career and progression (offer rapid promotion in return for working in remote areas).

- Recruiting locally

Local recruitment offers the advantage of not uprooting new teachers. Even so, this is not a universal remedy in that some candidates wish, above all else, to get away from their original community. This phenomenon can be handled in two ways:

i)   By extending recruitment to district level, and not just to the candidate's village, in an attempt to reduce the social constraints dictated by the community;

ii)   By not imposing recruitment on, but by letting it stem from, the teacher.

In other words, when it is up to the teacher to apply directly to schools with vacancies, then only the candidates who are motivated to work in these schools actually apply, thus eliminating the problem of subsequent refusals by teachers for these posts. In this case, the hiring process is entrusted to the schools' management committee. The literature on this subject also demonstrates that, with this system, most posts are filled and there is relatively little difference between pupil-teacher ratios in rural and urban areas.

Local recruitment can also compensate for the lack of teachers deployed by national structures. This concerns more particularly the recruitment of community teachers paid by the parents. Where these teachers have been supported by way of in-service training devices and been offered career prospects, the results have been positive.

- Decentralising pre-service training

As mentioned earlier in the case of Afghanistan, training centres set up at regional level can attract local candidates to the teaching profession, who will be more motivated to stay in the region once they have completed their training. This also enables targeting of candidates liable to teach in the local language.

- Decentralising and limiting teacher transfers

- Managing transfers locally can also contribute to improving teacher deployment in that it can adapt to the actual needs of each district or region. Moreover, a momentary limitation on inter or intra-regional transfers can be envisaged when imbalances are observed.

- Post-based assignment

The implementation of 'post-based management'» systems has proved to be relatively effective in some countries. The principle consists of proceeding with teacher deployment based on posts allocated to each school. When the posts are defined correctly at the level of each school, especially in accordance with enrolments and their growth, this system enables a reduction in the disparities that can stem from a traditional centralised system. Indeed, if, for example, a school is allocated five posts and one of them is vacant, only one teacher can be assigned to that school, significantly limiting inconsistent assignments. The implementation of a system of connection between a post and an assigned teacher has proved to be an effective option in Swaziland.

Box 6.3: Example of adjustments to teacher numbers

The problem encountered in **Swaziland** arose from a gap between teaching staff required according to allocation norms and the staff paid as included in the Treasury's payroll file.

The main causes of the problem were the following:

- Poorly controlled determination of needs at school level;

- Inadequate circulation of information between different administrative levels, on the imbalances existing in teacher assignment and utilisation;

- A multitude of databases on teachers and a lack of harmonisation between them;

- A lack of skills for personnel in charge of teacher management;

The main responses to these problems were the following:

- System of '1 post linked to the school – 1 teacher with the profile for the post';

- Integrated or harmonised education management information system;

- Improved information/transparency in terms of recruitment/assignment through

   * an improved EMIS

    * management audits;

 - Training for personnel in charge of teacher management;

Less global yet effective organisational measures:

- Simplification of data collection forms;

- Assistance in calculating teacher needs and posts;

- Improvement in monitoring capacities, in database management and data analysis at decentralised level;

- Better communication and information-sharing across administrative levels;

By definition, contract and community teachers are not concerned by this type of management. However, some countries such as Madagascar have adopted measures to avoid non-civil servant teachers being recruited without close monitoring and so avoid an increase in existing imbalances.

Box 6.4: Example of non-civil servant teacher management

In **Madagascar**, with the massive recruitment of non-civil servant teachers, rules have been developed to determine, school by school, the number of subsidised non-civil servant teaching posts : these are based on considerations related to pupil-teacher ratio and the number of existing classrooms (EFA, 2008).

- Scholarships

As an incentive for teachers to go to disadvantaged areas, some countries have opted for scholarships in return for the commitment from students to come back and teach in their region of origin, as is the case in **China**. Aside from the fact that they will not have to adapt to a new environment, they also have the advantage of mastering the local languages and are therefore conducive to early schooling of children in the region.

Box 6.5: Example of scholarship implementation

In **China**, the government set up the 'Free Teacher Education' programme in 2007, to encourage students achieving good results in the best universities, to teach in rural schools. Apart from the fact that they are exempt from tuition fees, by teaching in their region of origin, graduates enjoy job security for a period of 10 years. In 2007, 90 % of participants were from central and western regions which are, in most cases, the least developed and stable economically. Even when graduates find a post in an urban area, they must first of all teach for two years in a rural area (Wang and Gao, 2013).

Cambodia, **Ghana**, **Liberia** and **Papua New Guinea** offer scholarships to trainees from disadvantaged areas, who often have specific language skills.

Cambodia has made a special effort to improve teacher supply targeted on certain population groups and disadvantaged regions. The aim is to have 1 500 new trainees (of the 5 000 recruited every year) coming from disadvantaged regions who, once their training is complete, will be assigned to work in their region of origin. Overall, every year, around 95% of new graduates from the teacher training schools should be assigned to understaffed schools in remote and disadvantaged regions.

Source: UNESCO, 2014

- Boarding schools to ensure provision of education to pupils from rural areas

The strategy implemented in Botswana in 1994 in an attempt to group children from very isolated areas in boarding schools can be considered as limiting the problem of teacher shortages in these areas. This circumvention strategy has the advantage of addressing the problem of the access of minorities (semi-nomad communities in this case) to education while limiting deployment efforts in areas which are not very popular with teachers. As opposed to the strategies mentioned previously concerning teachers, this measure is an incentive for pupils from isolated areas to go to more populated areas, which are consequently more attractive for teachers, circumventing *de facto* the problem of teacher deployment in the most remote areas (at least for countries where the inclusion of minorities is a priority).

- Pedagogical reorganisation

In remote regions, where the number of pupils is often limited, teachers may be called upon to teach several age groups simultaneously in order to limit the loss of productivity linked to a low pupil-teacher ratio (PTR), which can be interpreted as teacher under-utilisation. In this respect, **organising multigrade classes** can compensate for teacher shortages. In that case, it is important to provide pedagogical support to enable teachers become familiar with multigrade class management and avoid their rapid demotivation. Strengthening the teachers' capacities to apply the targeted programmes is a priority, as is the development of relevant materials for the programme. In addition, it may also prove necessary to envisage specific support for pupils who have difficulty following.

Box 6.6: Example of multigrade class organisation

Cambodia, **Kenya** and **Papua New Guinea** plan to offer multigrade teacher training. The Cambodian education sector strategic plan aims at developing multigrade teaching methodology training for teachers in schools in remote areas, with priority given to those already teaching in multigrade classes. It also aims at drawing up an annual action plan for multigrade teaching in remote regions and in regions populated with minority ethnic groups.

Source: UNESCO, 2014

In highly-populated urban areas, the problem of teacher shortages will generally be handled differently, more particularly by **double shifts** for teachers: in most cases, teachers teach two distinct groups of pupils (one in the morning and one in the afternoon). There will be a salary compensation to make up for the extra work caused by this measure.

- Redeployment

In a context of teacher shortages, their redeployment can be a solution in providing a more balanced distribution of staff throughout the territory. This can concern both teachers in posts when they are in surplus in a given area, and teachers who are no longer teaching and are in administrative jobs.

Any redeployment policy must go hand in hand with a *plan* stating certain rules and logical steps to be followed, such as those listed below :

- ✓ Determination of needs (in quantitative and qualitative terms) in personnel (per level, area, etc.)
- ✓ Assessment of surpluses and deficits (per area, subject matter, etc.)
- ✓ Identification of staff to be redeployed
- ✓ Knowledge of their characteristics and actual utilisation (Tables 6.2 to 6.4 below)
- ✓ Definition of the criteria, rules and procedures governing redeployment
- ✓ Assessment of the charges/costs of implementation of the redeployment plan

Before engaging on large-scale redeployment, which is a costly and difficult operation, it is crucial to assess how many 'out of classroom' teachers can be effectively reassigned to a teaching position, which will moreover generally be in another location to the one where they are working at present.

Box 6.7: Examples of teacher redeployment

In **Mali**, an extensive teacher redeployment plan was drawn up in 1994/95; in **Senegal**, an operation to redeploy teachers in administrative positions to the classrooms was also prepared in the mid 1990's – at the request of the teacher unions who hoped in that way to avoid recruiting « volunteer » teachers; in **Benin**, at the same date, the government also planned on redeploying teachers in administrative posts to the classrooms; finally, without actually embarking on a vast operation of that type, **Burkina** Faso took steps that are supposed to make administrative posts less attractive to teachers by doing away with the special allowances connected to administrative positions to then.

However, redeployment turned out to be a difficult strategy to implement. Serious obstacles were observed for the implementation of the redeployment plans in **Mali** and **Senegal**: in **Mali**, the planned operation was hindered above all by insufficient information on the actual situation of teachers and the lack of accompanying measures (training for 'returning' to teaching; measures to encourage taking up the assigned post, etc.); in **Senegal**, the teacher unions were against implementation of the redeployment plan once they realised that this operation did not do away with the recruitment of « volunteer » teachers.

Questions for individual consideration

Analyse the three tables below concerning 'out of classroom' teachers in the country « X » and explain (approximately half a page) what the difficulties encountered could be when trying to reassign them to a teaching post in another region than the one where they are working at the time of the count.

Hereunder, three tables indicate the number and profile of 'out of classroom' teachers in the country « X ».

Table 6.2: Teachers in positions other than teaching – country « X »

Position occupied at present	Total 'out of classroom' teachers	Of which women
Posts in school administration	1197	20
Pedagogical advisors	340	16
Primary teachers with no indication of the post occupied	84	28
Secondary teachers with no indication of the post occupied	423	90
Documentation and archiving	124	55
Accountants	65	1
Secretaries	290	157
Other (with no indication of geographical location)	255	174
Total	2778	531

Table 6.3: Profile of teachers not teaching – country « X »

AGE	Region A	Region B	Region C	Region D	Region E	Region F	Region G	Region H	Country X
<25	-	1	-	-	-	-	-	-	1
25-30	1	-	-	2	-	1	-	10	14
30-35	24	4	2	3	2	2	1	44	82
35-40	36	29	37	28	9	4	16	231	390
40-45	61	62	64	58	43	23	24	348	683
45<	158	144	188	176	69	58	46	612	1451
N.I	7	8	4	6	3	9	5	115	157
TOTAL	287	248	295	273	126	97	92	1360	2778

N.I. : Not indicated

Table 6.4: Teacher redeployment – Who can be redeployed?
(Distribution by region and family status ; case of country « X »)

Family status	A	B	C	D	E	F	G	H	Overall Country X
NI	12	6	8	15	4	5	5	144	199
Single	15	5	7	6	4	4	4	105	150
Married, no children	7							88	169
Married 1-3 children	64							412	705
Married 4+ children	189	167	205	178	88	67	50	611	1555
TOTAL	287	248	295	273	126	97	92	1360	2778

NI: Not indicated

6.3 Strategy for creating a better qualitative balance

In most parts of the world, the level of qualifications required to become a teacher has risen over the last decades. In other words, 'new' teachers tend to have more qualifications than their older colleagues. Sending newly trained and recruited teachers to regions and areas where there is a lack of qualified teachers seems therefore to be one way of creating a better balance in teacher allocation throughout the territory from a qualitative point of view. This strategy has in fact been adopted with some variations in a number of countries.

- Sending new teachers to remote areas

In order to ensure a good balance in teacher deployment throughout the country, some governments have set up devices obliging teachers, especially beginning teachers, to work in remote disadvantaged regions. This type of planned deployment gives results when the government has control over teacher assignment in the schools. In this case, there are no, or fewer, vacant qualified teaching posts in remote areas (e.g. Oman, Ghana, ...).

Box 6.8: Example of 'newly qualified' teacher deployment to remote areas

In **Oman**, newly recruited teachers cannot choose a school but are assigned to a school by the Ministry of Education. However, teachers can request a transfer after one year: in 2009, 5.8% of all teachers were transferred, primarily away from remote regions, which have a high proportion of inexperienced teachers. In Al-Wusta in 2009, 59% of teachers had under 5 years experience compared to 26% at national level (Ministry of Education of Oman and World Bank, 2012).

In **Eritrea**, young teachers, who start their career in the framework of their national service, are sent to the most difficult schools in the 6 regions making up the country. In 2004/05, there was a strong link between the teacher and the number of pupils in the six regions.

Nevertheless, this measure does have its limits as there is the risk of teachers assigned to difficult areas not reporting to their post. It can be a source of teacher demotivation and high turnover.

It should therefore be adapted. This is the case in Korea where teachers accepting difficult posts are offered some kind of compensation, as explained in the box below.

- Teacher rotation for a better qualitative balance

Furthermore, **South Korea** applies a 5-year rotation system for qualified teachers as a solution to the problem of qualified teachers abandoning disadvantaged areas. This measure goes hand in hand with incentive measure (see below) for qualified teachers accepting to work in more difficult conditions.

Box 6.9: Example of teacher rotation

In the **Republic of Korea**, the teacher rotation system has contributed to both good and equitable school achievements. Decisions to take on teachers are taken at province or town level. The practice of rotating teachers every five years in a different school within the town or the province demonstrates the commitment to an equitable distribution of teachers. In addition, incentive measures are offered to teachers working in disadvantaged schools such as, for example, additional compensation, smaller classes, fewer teaching hours, the possibility of choosing their next school after teaching in a difficult region and more opportunities for promotion. This allows disadvantaged populations to benefit from highly qualified teachers with a good knowledge of the subject matter. Almost 70% of teachers in posts in villages have at least a university degree, compared to 32% in the large towns [Luschei et al., 2013 (Kang and Hong, 2008)].

Source: UNESCO, 2014

- 10 years of basic interdisciplinary education

One way of addressing the problem of the lack of and the utilisation of trained secondary teachers could be to extend primary education for 3 or 4 years in order to offer 10 years of basic education without disciplinary distinction, i.e. where teachers teach all subjects.

This option has both the benefit of reducing teacher under-utilisation in certain subjects and consequently the high costs related to subject specialisation, and, if applied as a general rule in the country, of limiting the inequalities in qualified teacher distribution (especially teachers of particularly popular subjects) across the different schools throughout the territory. It has however frequently encountered resistance from parents who tended to consider that doing away with specialisation at post-primary level corresponded to 'third-rate' lower secondary education and (for those who could do so) to desert these schools for private schools that have maintained subject specialisation at this level.

- Organisational improvements and capacity building

Over and above the measures intended to motivate individuals to go to disadvantaged areas and schools, we have underlined in this document the importance of an effective management system to optimise teacher allocation and utilisation.

'Management audits' can reveal factors liable to hamper, and others likely to foster, the proper functioning (including 'good behaviour') of teacher management.

Proper functioning supposes a functional definition of responsibilities as well as rules, procedures and management instruments that guide the actors in the transparent, effective and just management of teachers.

☰ Highlights

- Specific strategies enabling better teacher assignment and utilisation must take into account the *particular context* of the country concerned: labour market; financial resources available; norms and values of the population; positions of teachers and of teacher unions towards proposed reforms.

- To create a better balance in teacher allocation from a *quantitative point of view*, different types of measures can be envisaged and combined :

    - *Incentive* measures (allocations, accelerated promotion and other) aimed at encouraging teachers *individually* to come, or to stay, and teach in areas where teachers tend to be lacking;

    - *Service obligation* for newly recruited teachers in areas/schools with a shortfall;

    - Recruitment by the *school* or by the *district*, supposing that there are plenty of candidates, coupled with *decentralised* teacher *training*;

    - Rationalisation of the supply *structure* (grouping of schools, boarding schools; double-shift schools) to guarantee a better utilisation of available human resources;

    - Rationalisation of the *pedagogical organisation*: multigrade classes in areas with largely dispersed populations.

- To create a better balance in teacher allocation from a *qualitative point of view*

    - The above measures can also contribute to reducing inequalities qualitatively, especially in the distribution of qualified teachers;

    - Strategies that combine strong encouragement for rotation with advantages for the teachers, like in South Korea, seem promising in order to arrive at more equitable teacher assignment throughout the territory.

- To *optimise* teacher *utilisation*

    - Appropriate school size and structure for efficient utilisation;

    - Versatile multi-subject teachers;

    - Flexibility of teacher employment/allocation conditions;

    - Teachers' official working hours comparable to those in neighbouring countries,

are all enabling factors.

- Management system and behaviour

The improvement to teacher assignment and utilisation can only be made with competent and honest management behaviour on a daily basis. It therefore requires suitably trained management personnel and a set of rules, instruments and corrective measures to guide and facilitate fair and effective management operations.

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