

# Increasing teacher effectiveness

Second edition

Lorin W. Anderson

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## Fundamentals of educational planning

The booklets in this series are written primarily for two types of clientele: those engaged in educational planning and administration, in developing as well as developed countries; and others, less specialized, such as senior government officials and policy-makers who seek a more general understanding of educational planning and of how it is related to overall national development. They are intended to be of use either for private study or in formal training programmes.

Since this series was launched in 1967, practices and concepts of educational planning have undergone substantial change. Many of the assumptions which underlay earlier attempts to rationalize the process of educational development have been criticized or abandoned. Even if rigid mandatory centralized planning has now clearly proven to be inappropriate, this does not mean that all forms of planning have been dispensed with. On the contrary, the need for collecting data, evaluating the efficiency of existing programmes, undertaking a wide range of studies, exploring the future and fostering broad debate on these bases to guide educational policy and decision-making has become even more acute than before. One cannot make sensible policy choices without assessing the present situation, specifying the goals to be reached, marshalling the means to attain them and monitoring what has been accomplished. Hence planning is also a way to organize learning: by mapping, targeting, acting and correcting.

The scope of educational planning has been broadened. In addition to the formal system of education, it is now applied to all other important educational efforts in non-formal settings. Attention to the growth and expansion of education systems is being complemented and sometimes even replaced by a growing concern for the quality of the entire educational process and for the control of its results. Finally, planners and administrators have become more and more aware of the importance of implementation strategies and of the role of different regulatory mechanisms in this respect: the choice of financing methods,

the examination and certification procedures or various other regulation and incentive structures. The concern of planners is twofold: to reach a better understanding of the validity of education in its own empirically observed specific dimensions and to help in defining appropriate strategies for change.

The purpose of these booklets includes monitoring the evolution and change in educational policies and their effect upon educational planning requirements; highlighting current issues of educational planning and analyzing them in the context of their historical and societal setting; and disseminating methodologies of planning which can be applied in the context of both the developed and the developing countries.

For policy-making and planning, vicarious experience is a potent source of learning: the problems others face, the objectives they seek, the routes they try, the results they arrive at and the unintended results they produce are worth analysis.

In order to help the Institute identify the real up-to-date issues in educational planning and policy-making in different parts of the world, an Editorial Board has been appointed, composed of two general editors and associate editors from different regions, all professionals of high repute in their own field. At the first meeting of this new Editorial Board in January 1990, its members identified key topics to be covered in the coming issues under the following headings:

1. Education and development.
2. Equity considerations.
3. Quality of education.
4. Structure, administration and management of education.
5. Curriculum.
6. Cost and financing of education.
7. Planning techniques and approaches.
8. Information systems, monitoring and evaluation.

Each heading is covered by one or two associate editors.

The series has been carefully planned but no attempt has been made to avoid differences or even contradictions in the views expressed by the authors. The Institute itself does not wish to impose any official doctrine. Thus, while the views are the responsibility of the authors and may not always be shared by UNESCO or the IIEP, they warrant attention in the international forum of ideas. Indeed, one of the purposes of this series is to reflect a diversity of experience and opinions by giving different authors from a wide range of backgrounds and disciplines the opportunity of expressing their views on changing theories and practices in educational planning.

Since the early 1980s, societies have become increasingly concerned with the rapid progress of technology and the prospects it holds for the future in facilitating all aspects of life: work, leisure and education.

The integration of computers and technology into schools is an expensive and sometimes complex process. It requires all the necessary equipment, competent staff to get it up and running, technical support, and teaching of others to use it correctly and effectively. However, its advantages are evident, and the benefits that it can bring to schools and their pupils are significant enough to make the introduction of technology into the classroom one of the priorities of educational planners in both developed and developing countries, although the challenges and obstacles that may need to be overcome in both of these settings can be quite different.

Aware of the concern of many planners and policy-makers all over the world for a better quality of education, as well as of the central, if not unique, role of teachers in the transmission of knowledge, the Editorial Board asked Lorin Anderson of the University of South Carolina to prepare this booklet, *Increasing teacher effectiveness*. In this updated version, the author synthesizes a mass of recent research results on teacher effectiveness and teaching, and suggests how this knowledge could be used to increase effectiveness. This booklet is thus a valuable source of information for all those planners,

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researchers and teachers who are concerned with increasing the quality of education.

The Institute would like to thank Professor T. Neville Postlethwaite, Co-General Editor and Special Editor of this publication, for the active role he played in its preparation.

Gudmund Hernes  
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## Preface

In 1991, the International Institute for Educational Planning published the first edition of *Increasing teacher effectiveness* by Lorin Anderson in its 'Fundamentals of Educational Planning' series. This booklet was used primarily by researchers in ministries of education and elsewhere who had to undertake research on various aspects of teachers and teaching, but it was also used by international agencies having to develop teacher questionnaires for their studies. Even in 2003, the Organization for Economic Development (OECD) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) were looking at several of the measures in the appendices of the 1991 Anderson booklet for insights for their World Education Indicators programme.

In early 2003, the Board of the 'Fundamentals of education planning' series decided that the time was ripe to invite Professor Anderson to update his 1991 booklet. Not only did he agree to do this, but the revision he has undertaken is extensive. There has been an accumulation of knowledge in the 12 years since the publication of the first edition, and this has all been included in this second edition. It has brought up to date what is known about increasing teacher effectiveness.

Teacher salaries still account for 70 to 90 per cent of the education budget in most countries. It is through teachers and teaching that, to a great extent, the learning process is organized. A great deal of money has been expended in research trying to discover the characteristics and activities of a 'good' or 'effective' teacher. Teachers, though, work within schools with certain structures and curricula. The teacher plans the environment of the classroom, organizes and manages the class, determines the detailed curriculum that will be presented to the students, as well as its sequencing and pacing, the overall structure of the lessons (how much and what kinds of student listening and activities), the homework which is to be

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set, the feedback mechanisms to know how each pupil is 'getting on' and the correctives to be taken. It is the teacher who determines the ambience of the classroom and, together with other members of staff, the ambience and expectations of the school. Some teachers plan and execute these elements more effectively than others. But what is it, in particular, that makes an effective teacher?

In planning education, planners have to look after the infrastructure of the school, the equipment and supplies of the school, the material resources in the classrooms and schools, the curricula to be used, the supply of textbooks and, above all, the quality of the human resources put into each and every school. One issue of great importance when planning human resources in schools is that of equity. Do schools have the same quality of staff? What indicators should planners use in a database about teachers so that they (the planners) can be reasonably sure about equity of supply? There are, of course, other inputs to schooling that affect learning outcomes, as Anderson has pointed out in the introductory chapter to this booklet. But by considering those aspects of teachers and teaching that impinge on learning, the reader will become more aware of what he or she should be doing when planning the inputs of human resources to schools. There are also implications in this booklet for those responsible for the pre- and in-service training of teachers. There are implications for those responsible for inspections of schools and teachers, for school advisers and for those running educational resource centres.

The author has provided an appendix of many types of instruments used to measure different aspects of classroom teaching. This includes more instruments than the first edition, and in some cases new or expanded versions of what appeared in the first edition.

Professor Lorin Anderson of the University of South Carolina in the United States of America has been deeply involved in research on teaching in his own country and in many other countries. The Board of the Fundamentals of Educational Planning was delighted when Professor Anderson agreed to revise his booklet. Not only does he know the field well, but he presents the facts in a lucid and elegant way.

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Planning education has moved its emphasis away from ensuring that all pupils go to school to ensuring that they learn when they are in school – in other words, from planning the quantity of education to planning the quality of education. The role of the teacher has become even more important in the planning process. All readers of this booklet will benefit from this excellent summary of the current state of knowledge concerning teacher effectiveness. I have no doubt that this edition will be equally as popular, if not more so, than the first edition.

T. Neville Postlethwaite  
Co-General Editor



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## I. Understanding teacher effectiveness

Investment in education is essential for both personal growth and economic development. The World Declaration on Education for All, Article 5, states that primary education must be universal to ensure that the basic needs of all children are met. Basic learning needs are defined in terms of the essential learning tools and the basic learning content that people require in order to survive, to live and work with dignity, to improve the quality of their lives, to make informed decisions, and to continue learning (UNESCO, 1996). Economically, the developing countries that have gained the most from integrating the world economy have shown impressive gains in primary education (World Bank, 2002).

Because of the demand created by expanded primary schooling and the need for an ever better educated workforce, investment in secondary education has become extremely important in developing countries. At present, however, more than 40 countries have a gross secondary enrolment rate of less than 40 per cent. There are countries whose labour force contains fewer than 20 per cent of workers who have successfully completed secondary education (Lewin and Caillods, 2001). In developing countries, secondary education produces the graduates who become primary school teachers. Secondary education also contributes to establishing equity within these societies.

Increased access to primary and secondary education places great demands on the quality of the teaching force. During the 1990s, the increase in the school-age population outpaced the growth in the number of teachers worldwide. Even in industrialized nations, deteriorating working conditions and low salaries are discouraging people from entering the teaching profession. In many of the least developed countries, the majority of primary school teachers have, at most, a lower secondary qualification, and frequently no professional training at all (UNESCO, 2002). As Hallak (2000: 1) pointed out, “enrolment rates are ... up in most regions, but the quality of education

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has been suffering. Education for all is all very well, but good quality education for all is another story”.

For many years, educators and researchers have debated over which variables influence student achievement. A growing body of evidence suggests that schools can make a great difference in terms of student achievement, and a substantial portion of that difference is attributable to teachers. Specifically, differential teacher effectiveness is a strong determinant of differences in student learning, far outweighing the effects of differences in class size and class heterogeneity (Darling-Hammond, 2000). Students who are assigned to one ineffective teacher after another have significantly lower achievement and learning (that is, gains in achievement) than those who are assigned to a sequence of several highly effective teachers (Sanders and Rivers, 1996). Thus the impact of teacher effectiveness (or ineffectiveness) seems to be additive and cumulative.

Which factors contribute to teacher effectiveness? Fortunately, there has been a convergence of the available research data pertaining to this question over the past 15 years (Brophy, 2001; Creemers, 1999; Hay McBer, 2000; Scheerens, 2003). Some of these factors fall under the general heading of ‘teacher characteristics’. Teacher characteristics are relatively stable traits that are related to, and influence, the way teachers practise their profession. *Table 1* contains a set of 12 teacher characteristics identified by Hay McBer (2000) based on a large-scale study conducted in the United Kingdom. These characteristics are organized into four ‘clusters’: professionalism, thinking/reasoning, expectations and leadership.

**Table 1. Summary of characteristics associated with more effective teachers**

Cluster	Characteristic	Description
Professionalism	Commitment	Commitment to doing everything possible for each student and enabling all students to be successful
	Confidence	Belief in one's ability to be effective and to take on challenges
	Trustworthiness	Being consistent and fair; keeping one's word
	Respect	Belief that all individuals matter and deserve respect
Thinking/reasoning	Analytical thinking	Ability to think logically, break things down, and recognize cause and effect
	Conceptual thinking	Ability to identify patterns and connections, even when a great deal of detail is present
Expectations	Drive for improvement	Relentless energy for setting and meeting challenging targets, for students and the school
	Information seeking	Drive to find out more and get to the heart of things; intellectual curiosity
	Initiative	Drive to act now to anticipate and pre-empt events
Leadership	Flexibility	Ability and willingness to adapt to the needs of a situation and change tactics
	Accountability	Drive and ability to set clear expectations and parameters and hold others accountable for performance
	Passion for learning	Drive and ability to support students in their learning, and to help them become confident and independent learners

Source: Adapted from Hay McBer, 2000.

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Several of these characteristics have also been identified by other researchers. 'Commitment' and 'drive for improvement', for example, combine to form what Slavin *et al.* (1995) referred to as 'relentlessness', and what Anderson and Pellicer (1998) termed 'zero tolerance for failure'. Also 'confidence' is similar to what Ashton and Webb (1986) have termed 'self-efficacy'. Despite differences in nomenclature, then, the teacher characteristics included in *Table 1* have been found to be related to teacher effectiveness in a variety of settings by a variety of researchers.

It is important to note, however, that the influence of teacher characteristics on teacher effectiveness is not direct. Rather, it is moderated or mediated by their effect on the way in which teachers organize their classrooms and operate within them. In Bloom's (1972) terms, what teachers *are* influences what teachers *do*; what teachers *do*, in turn, influences what, and how much, students learn (see *Figure 1*). This is a booklet about what teachers do in their classrooms, the ways in which whatever it is they do influences student learning and achievement, and how policy-makers and educational planners can help teachers to become better at what they do.

### *What is an effective teacher?*

Effective teachers are those who achieve the goals which they set for themselves or which they have set for them by others (e.g. ministries of education, legislators and other government officials, school administrators). As a consequence, those who study and attempt to improve teacher effectiveness must be cognizant of the goals imposed on teachers or the goals that teachers establish for themselves, or both.

A corollary of this definition is that effective teachers must possess the knowledge and skills needed to attain the goals, and must be able to use that knowledge and those skills appropriately if these goals are to be achieved. In Medley's (1982) terms, the possession of knowledge and skills falls under the heading of 'teacher competence'. In contrast, the use of knowledge and skills in the classroom is referred to as 'teacher performance'. Thus, those who investigate and attempt to understand teacher effectiveness must be able to link teacher

competence and teacher performance with the accomplishment of teacher goals (that is, 'teacher effectiveness').

Four major assumptions are implicit in this definition of teacher effectiveness. The first is that effective teachers tend to be aware of and actively pursue goals. These goals, in turn, guide their planning as well as their behaviours and interactions with students in the classroom. This assumption does not mean that effective teachers are always aware of goals; in fact, awareness is particularly likely to be lacking when goals have been established for teachers by others. Using current educational terminology, these 'goals established by others' are referred to as 'standards' (sometimes 'content standards' or 'curriculum standards'). That is, standards are externally imposed goals that indicate what students should know and be able to do as a result of the instruction that they receive.

This definition of teacher effectiveness does not mean that everything that teachers think about or do is (or should be) related to the attainment of some goal. Teachers, like the rest of us, often do things on their own initiative which are independent of any motivation to fulfil a certain goal. Rather the definition lies in a second assumption; namely that teaching is an intentional and reasoned act. "Teaching is intentional because we always teach for some purpose, primarily to facilitate learning. Teaching is reasoned because what teachers teach their students is judged by them to be worthwhile" (Anderson *et al.*, 2001: 3).

A third assumption implicit in this definition of teacher effectiveness – an assumption alluded to in the previous paragraph – is that the vast majority of teachers' goals are, or should be, concerned either directly or indirectly with their students' learning. An example of direct teacher concern with learning is a teacher who states that he or she intends to help students develop the ability to differentiate facts from opinions, or reality from fantasy. An example of indirect teacher concern with learning is a teacher who sets out to decrease the level of disruptive behaviour in the classroom because he or she believes that learning cannot occur before the level of disruptive behaviour is reduced. It should be obvious that if teachers' goals are stated in terms of their students' learning, then, as Medley (1982: 1894) has

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asserted, “teacher effectiveness must be defined, and can only be assessed, in terms of behaviours and learning of students, not behaviours of teachers”. In this regard, it is worth noting that the World Bank (1990: 54) has suggested that “countries must emphasize students’ learning as the key policy objective”.

A fourth assumption underlying this definition of teacher effectiveness is that no teacher is effective in every aspect of their profession. For example a primary school teacher may be highly successful in teaching reading comprehension to his or her students while struggling to teach them the elements of rudimentary problem-solving in mathematics. Likewise a secondary literature teacher may be quite able to teach students an appreciation of poetry, but have some difficulty in teaching them how to interpret the symbolism in a series of novels. Thus, the degree to which a given teacher is effective depends, to a certain extent, on the goals being pursued by that teacher (Porter and Brophy, 1988).

Similarly, an elementary school teacher may be very gifted in dealing with less able students, while at the same time feeling quite frustrated with his or her inability to render the work more challenging for the more able students. A secondary mathematics teacher may be particularly adept with students who are well motivated to learn mathematics, but have great difficulty motivating those who question why they have to learn mathematics in the first place. Thus, the degree to which a teacher is effective also depends, to a large extent, on the characteristics of the students being taught by the teacher.

Despite the underlying assumptions, it seems reasonable to assume that those who are referred to as being ‘effective teachers’ are more often than not effective in achieving specified learning goals. In other words, there is some degree of consistency in these teachers’ effectiveness vis-à-vis classroom conditions, time and goals. As will be evident throughout this booklet, however, this effectiveness does not stem from rigid adherence to a standard set of behaviours, activities, methods or strategies in all situations. Rather, teachers who are consistently effective are those who are able to adapt their knowledge and skills to the demands inherent in various situations so as to best achieve their goals. Doing whatever is necessary in order to achieve

these goals, rather than doing certain things in certain ways or using certain methods or techniques, is a hallmark of an effective teacher. In summary, then, an effective teacher is one who quite consistently achieves goals – be they self-selected or imposed – that are related either directly or indirectly to student learning.

### *What is the role of teachers in student learning?*

Teachers and the instruction they give their students are only two of a complex set of factors that have an impact on student learning. One of the fundamental truths in education is that the knowledge, skills, aptitudes, attitudes and values with which students leave school or a particular teacher's classroom are influenced to a great extent by the knowledge, skills, aptitudes, attitudes and values that students possessed when they entered the school or classroom. In addition, the knowledge, skills, aptitudes, attitudes and values that students possess when they enter a school or classroom are the result of some intricate and complex combination of their genetic composition and the environment to which they have been exposed in their homes. To complicate matters further, early differences among children are often magnified by their parents' decisions concerning the school to which they send their children, and teachers' and parents' decisions as to the programmes that are implemented in that school. Therefore, as this booklet investigates and attempts to understand teacher effectiveness, an important factor to consider, as well as where students are going (as determined, in part, by the goals of the teacher), is where they have been (as determined, in part, by their genetic composition, their home background and their prior schooling experiences).

In addition to these genetic and environmental factors which are beyond the control of any teacher, teachers are powerless in terms of making learning occur; they cannot simply open up the tops of their students' heads and pour in the desired learning. The stimulus-response theory has long been dismissed as a viable theory for understanding the link between teaching and learning (that is, teachers teach (stimulus) and students learn (response)). As Tyler (1949) pointed out over half a century ago, learning depends on the activities of the student:

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Students learn according to what they do, not according to what their teacher does; they either pay attention or they do not; they either construct their knowledge consistently with the teacher's intended construction of knowledge, or they do not. More than a quarter of a century later, Rothkopf (1976: 94) reinforced Tyler's contention by emphasizing the negative case: "The student has complete veto power over the success of instruction". Teachers can neither make students pay attention, nor can they construct meaning for them. So what can teachers do? What exactly is the role of the teacher in student learning? Teachers must create conditions that reduce the likelihood that students will use their veto power and increase the probability that students will put forth the time and effort needed to learn what their teachers intend them to learn. This booklet is about creating appropriate conditions, and advising teachers on how to use these conditions to increase their effectiveness.

At this point in the discussion, some educators and policy-makers may throw up their hands and suggest that any attempt to improve teacher effectiveness is therefore futile. After all, if the genetic composition, home background and prior schooling experiences of students account for more than the schools which they attend and the teachers they encounter, and if a standard set of behaviours, methods, techniques and practices that will lead to more effective teaching cannot be identified, then why bother inquiring about increasing teacher effectiveness? The counter argument (and the argument underlying this booklet) is threefold, as we shall see in the following paragraphs.

First, when looked at over extended periods of time (that is, time periods longer than a single week, month, term or year), teachers can and do have a tremendous impact on the learning of their students. One of the most obvious impacts of schooling on student learning over the long haul is the dramatic increase in differences in student achievement as evidenced by increased variation in standardized test scores over an eight- to ten-year period. It is important to understand what it is about differences in teacher effectiveness that produces such remarkable differences in student learning.

Second, there is ample anecdotal evidence that individual teachers can (and do) have profound effects on individual students. Most people can think back to their school days and recall one or more teachers who made a real difference in their lives. Because of one particular teacher, a complex idea was understood, a special interest in a particular subject area was developed, or a desire to pursue a certain career was cultivated. To the extent that these achievements/acquisitions represent goals – either for the teacher, for an external agency or for the student himself or herself – there can be no doubt that these teachers were effective. It is important to understand what it is about such teachers that makes them effective.

Third, whether teachers have an impact on student learning depends not only on teachers possessing the knowledge and skills needed to facilitate student learning, but also on their knowing when to use that knowledge and those skills to achieve the goals they establish or accept for their students. In this regard, the cards may be stacked against teacher effectiveness. That is, there may be far more ways in which teachers can be ineffective than there are in which they can be effective. The point to be made here, however, is simple: The fact that some teachers do not possess the necessary knowledge and skills, do not know when to use that knowledge and those skills, or are not student-oriented in their thinking and planning, does not undermine the concept of teacher effectiveness. Rather, these deficiencies simply make the task of increasing teacher effectiveness more difficult. It is important to understand how teachers and the schools in which they work can be helped to become more effective.

### *A conceptual framework*

A conceptual framework is a model of reality that includes the key concepts that are used to understand reality and the relationships between and among these concepts. To put it somewhat differently, conceptual frameworks are used as a lens in attempting to make sense of the world. The conceptual framework used in preparing this booklet is shown in *Figure 1*.

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The framework contains six concepts. Two of these concepts – teacher characteristics and student characteristics – are ‘givens’ in most schools. Students either enrol in schools based on established attendance zones, or are enrolled in schools at the choice of their parents. Teachers are employed in schools, usually for a period of several years. As a consequence, neither of these concepts is conducive to bringing about great change in a relatively short period of time. In Bloom’s (1981) terms, neither are they an ‘alterable variable’. Nevertheless, as mentioned earlier, the characteristics of both teachers and students are important to consider in examining and seeking to understand teacher effectiveness.

In contrast with teacher characteristics and student characteristics, the three concepts in the middle column of *Figure 1* are clearly alterable. Furthermore, changes in these concepts – curriculum, classroom and teaching – can be expected to result in increases or decreases in teacher effectiveness. As a consequence, policies related to these concepts are also quite likely to result in increases or decreases in teacher effectiveness.

The first concept (curriculum) includes the standards that define the intended student learning outcomes – the objectives. The curriculum also includes the learning units that are designed to help students achieve those standards (or objectives). Dividing the curriculum into coherent, meaningful learning units is necessary for many reasons, not least of which is the fact that teachers cannot teach all standards simultaneously. As will be discussed in *Chapter II*, however, there are other advantages of dividing the curriculum into learning units. In designing learning units, planners and/or teachers should focus their attention on four primary questions:

1. What standards/objectives should students achieve in the amount of classroom time allocated to the unit? – the learning question.
2. What instructional strategies and materials should be included in the unit to enable large numbers of students to achieve high levels of learning? – the instruction question.
3. What assessment instruments and/or procedures should be included in the unit so that accurate information is gathered on how well students are learning? – the assessment question.

4. How does one ensure that standards/objectives, instruction and assessment are consistent with one another? – the alignment question.

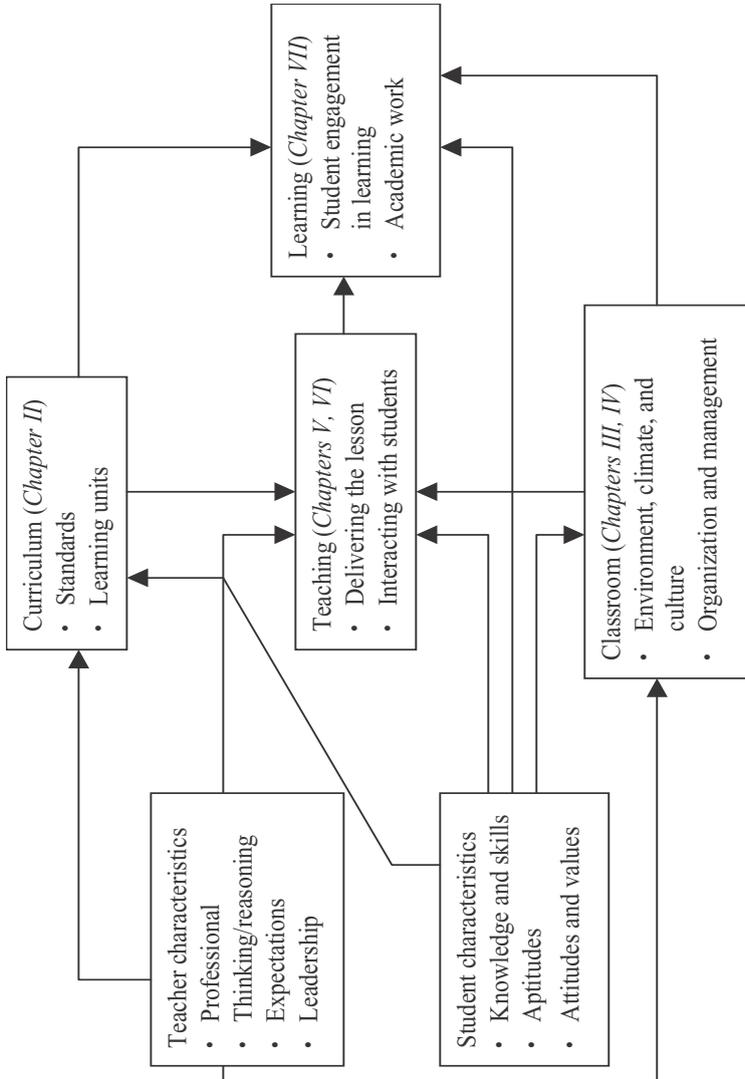
The concept at the bottom of the second column in *Figure 1* – the classroom – includes the physical environment, the psychological environment (climate) and the socio-cultural environment (culture), as well as the ways in which both students and learning are organized and managed within these environments. Teachers set the tone for their classrooms, partly by establishing classroom rules and routines and engaging in preventive management behaviours. These rules, routines and behaviours, in turn, influence students' behaviour in the classroom.

*Chapter III* is concerned with classroom environment, climate and culture, while *Chapter IV* deals with classroom organization and management.

The middle concept in the second column of *Figure 1* (teaching) consists of the ways in which teachers structure and deliver their lessons and the ways in which they interact, verbally and non-verbally, with their students. In *Chapter V*, lesson structure and delivery are discussed, while in *Chapter VI*, the focus of the discussion is on teachers' interactions with their students.

The final concept in *Figure 1* is student learning. In contrast with student achievement, student learning is a process. Achievement indicates what a student has learned (what he/she knows or can do) at a particular point in time. Learning, on the other hand, refers to changes in achievement over time. That is, if a student does not know something at the beginning of a unit, but does know it (and knows it quite well) at the end, he or she has learned. Because learning is a process, it is possible to gather some information about learning while it is occurring. Two indicators of learning that are explored in some detail in *Chapter VII* are student engagement in learning, and the quality of their academic work.

**Figure 1. A conceptual framework for understanding and improving teacher effectiveness**



In *Figure 1*, the arrows indicate the direction of the expected influences between and among the concepts. Two types of influence are evident: direct and indirect. Arrows connecting adjacent concepts indicate hypothesized direct influences of one concept on another. For example, student learning is believed to be *directly* influenced by the curriculum, the teaching, the classroom and the students' characteristics. These are the four concepts which have arrows directly linked to student learning. Note that the remaining concept (teacher characteristics) is not believed to influence student learning *directly*, since there is no arrow linking these two concepts. Rather, teacher characteristics are believed to influence student learning *indirectly* by virtue of their direct influence on the curriculum, the classroom and the teaching.

The model displayed in *Figure 1* is intended to serve as a heuristic. As Krathwohl (1994: 182) pointed out, "Heuristic frameworks are valued for the thought they simulate, often leading to new insights and understandings". This statement captures the intent of *Figure 1* very well. More comprehensive frameworks could be developed; these would include concepts such as school organization and administration, policies governing student placements and evaluation, and teacher preparation and staffing. The emphasis in this booklet, however, is on teacher effectiveness, not school effectiveness, policy analysis, or teacher education. The heart of any conceptual framework developed for the purpose of understanding and improving teacher effectiveness resides in four primary concepts that are the focal point of this booklet: the curriculum, the classroom, teaching and learning.

### *A closing comment for policy-makers and educational planners*

The chapters of this booklet are specific concepts in the framework. These relationships are indicated in *Figure 1* by brackets, each containing the appropriate chapter number or numbers.

In each chapter, the basic concepts and principles associated with teacher effectiveness are described and illustrated. Each chapter

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also includes a set of recommendations for increasing teacher effectiveness. These recommendations concern what teachers should know and be able to do if they are to be effective in their classrooms. Each chapter that follows this one also includes a second set of recommendations which are addressed to policy-makers and educational planners at the local, state (or regional) and national levels, and which emphasize what these two groups can (and perhaps should) do to establish the conditions and provide the resources that are needed for teachers to become increasingly effective in their classrooms. Instruments that can be used to collect data on selected concepts and principles are included as appendices. By understanding the basic concepts and principles, and by collecting data on current educational practices, policy-makers, educational planners and teachers themselves are in a much stronger position to make decisions that will ultimately increase teacher effectiveness.

## II. Standards and structure of learning units

Teaching is an intentional and reasoned act. It is intentional because teachers teach for a purpose, which is, more often than not, to facilitate student learning. Teaching is reasoned because teachers judge what they teach their students to be worth while. The reasoned aspect of teaching relates to the objectives that teachers select for their students or have selected for them by others (e.g. ministries of education, school administrators). The intentional aspect of teaching concerns *how* teachers decide to help students achieve the objectives; that is, the learning environments they create and the activities and materials they provide within those environments (Anderson *et al.*, 2001).

### *Objectives*

For several decades, objectives have been called many things. Some of the most frequently used terms have been ‘aims’, ‘goals’ and ‘intended learning outcomes’. In many parts of the world, the term ‘standards’, or more specifically ‘content standards’ or ‘curriculum standards’, is the current terminology used to refer to objectives. In fact, standards are nothing more than mandated or externally imposed objectives. That is, some outside agency or professional association determines that teachers should teach certain objectives to their students. They publish listings of these standards which, in turn, become the basis for curriculum planning. When this occurs, the curriculum is said to be ‘standards-based’. Throughout this booklet, the terms ‘standards’ and ‘objectives’ will be used interchangeably. Where one of the terms appears, the other could generally be substituted in its place with no loss of meaning.

Regardless of what objectives are called, they tend to have a similar structure when written; namely, subject-verb-object (SVO). The subject is the students. The object indicates the content that the students are expected to learn (e.g. current events, disease, mammals, polygons, rhythm, sentence structure ...). The verb connects the

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students to the content; that is, it indicates what students are to do with, or learn about, the content. Are they to remember it, use it, or think about it? Within this common structure, then, the following objectives can be found:

- The student (subject) will be able to identify (verb) nouns in sentences (object).
- Students (subject) will learn how to multiply (verb) two three-digit numbers (object).
- The student (subject) should understand (verb) the causes of various diseases (object).
- Students (subject) should be able to determine (verb) the likelihood that a proposed solution to a problem will actually solve the problem (object).

When teaching within a standards-based curriculum, teachers must understand the standards. If a teacher is going to teach students to understand the causes of various diseases, the teacher must understand the meaning of ‘understand’ as well as the ‘causes of various diseases’. In fact, the teacher must understand these terms and concepts well enough to teach them to his or her students. Shulman (1987: 15) has referred to this type of understanding as ‘pedagogical content knowledge’, which he has defined as follows. Pedagogical content knowledge is the knowledge that a teacher needs to “transform the content knowledge he or she possesses into forms that are pedagogically powerful and yet adaptive to the variations in ability and background presented by the students”.

Just as a conceptual framework is needed to understand teacher effectiveness (see *Chapter I*), a conceptual framework – albeit a different one – is needed to understand standards. One recently developed framework is a revision of Bloom’s taxonomy of educational objectives (Anderson *et al.*, 2001). Bloom’s original taxonomy included six categories arranged along a single continuum of complexity. The categories were knowledge, comprehension, application, analysis, synthesis and evaluation.

The revised framework differs from the original in four primary ways. First, the names of the categories were transformed into their

verbal form (e.g. ‘application’ became ‘apply’). This enabled us to link the taxonomic categories more easily with the common structure of objectives. Second, changes were made in the way in which some of the categories were labelled. For example, ‘comprehension’ became ‘understand’ (rather than ‘comprehend’). Third, the order of the two highest categories was changed: ‘synthesis’ (now ‘create’) replaced ‘evaluation’ (now ‘evaluate’) as the uppermost category. Fourth, a second dimension was added to represent the content portion (i.e. the object) of statements of objectives. To allow comparisons to be made across subject-matters and grade levels, however, subject-matter content was replaced by types of knowledge of this second dimension. Based on a wealth of cognitive psychological research, four types of knowledge were identified: factual, conceptual, procedural and metacognitive. The result of all this activity was the development of a conceptual framework known as the Taxonomy Table (see *Table 2*).

As shown in *Table 2*, the Taxonomy Table has two dimensions: the horizontal dimension, which is a direct modification of Bloom’s taxonomy (retaining six cognitive process categories), and the vertical dimension, which contains the four types of knowledge mentioned above. To place an objective or standard in the Taxonomy Table, you begin by identifying the verb and the object. In fact, it is often easier to begin with the object and then move to the verb. Consider one of the objectives mentioned earlier: “The student will be able to identify nouns in sentences”. The object is ‘nouns in sentences’. Nouns are concepts, or ‘mental categories’. The verb is ‘identify’. If students are expected to identify nouns in sentences that they have already seen, the verb would be classified as ‘remember’. If, on the other hand, students are expected to identify nouns in sentences that they have not encountered based on their understanding of the concept of a noun, the verb would be classified as ‘understand’. Since the latter is generally the intent of such an objective, this objective would be of the general form: “The student will understand conceptual knowledge”.

Consider as a second example: “The student will learn how to multiply two three-digit numbers”. In this example, ‘multiply’ is both the end of the verb and the beginning of the object. As the object, the word ‘multiply’ discloses that whole number multiplication algorithm

is the issue. Algorithms, like methods, techniques and the like, are procedures. As a verb, ‘multiply’ suggests that students are expected to use their knowledge of, rather than simply remember or even understand, multiplication algorithm. In the language of the Taxonomy Table, to use is to apply. Thus, this objective is of the general form: “The student will apply procedural knowledge”.

**Table 2. The Taxonomy Table**

The knowledge dimension	The cognitive process dimension					
	1 Remember	2 Understand	3 Apply	4 Analyze	5 Evaluate	6 Create
A. Factual knowledge						
B. Conceptual knowledge						
C. Procedural knowledge						
D. Meta-cognitive knowledge						

Two tables – shown in *Appendices A* and *B* – have been prepared to help teachers to analyze objectives and standards in the terms of the Taxonomy Table. *Appendix A* contains information relative to the knowledge dimension, while *Appendix B* contains information relative to the cognitive process dimension. Using these tables, it is possible to categorize the vast majority of objectives and standards that teachers encounter. The process of categorization, in turn, increases teachers’ understanding of the meaning of the objectives they establish for their students or the standards that are established for them by others.

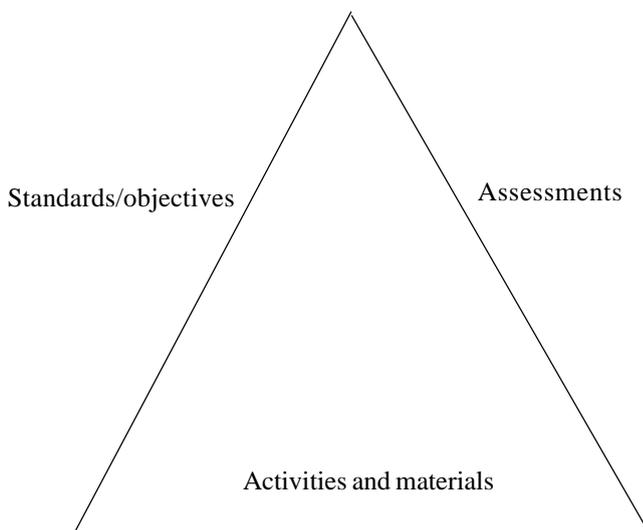
Based on the research conducted in the preparation of the Taxonomy Table, a large percentage of currently available standards can be placed into one of three cells: remember factual knowledge (Cell A1), understand procedural knowledge (Cell B2), and apply

procedural knowledge (Cell C3). As a consequence, knowing how to teach and assess student learning in each of these three cells will help teachers to become more effective.

### *Learning units*

The basic unit of curriculum design is the learning unit. A learning unit can be defined as an interrelated set of objectives, assessments, and activities and materials that require several weeks to teach (generally three or more). Practically speaking, a learning unit may correspond to a chapter in a textbook or may be defined by a topic that holds the pieces together (e.g. a unit on quadratic equations, a unit on short stories, a unit on earthquakes and volcanoes, a unit on explorers). A visual representation of a learning unit is shown in *Figure 2*.

**Figure 2. The structure of a learning unit**



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As shown in *Figure 2*, learning units have three components: standards or objectives, assessments (including formal tests), and activities and materials. The relationship between the three components is represented as a triangle, indicating the need to connect all three components if the learning units are to be effective in helping large numbers of students achieve the objectives or standards so that they can demonstrate that achievement during some form of assessment. For example, the unit assessments should provide information about how well students have learned the unit standards. Similarly, the activities and materials included in the unit should be those that are most likely to enable students to achieve the unit standards.

The strength of the relationships among the three components is referred to as the degree of *alignment*. Anderson (2002) has suggested that the Taxonomy Table is a useful tool for estimating the degree of alignment present in learning units. The extent to which there is a high degree of correspondence between the standards or objectives and the assessments – particularly when the assessments are formal tests – is referred to as *opportunity-to-learn* (McDonnell, 1995; Muthen *et al.*, 1995). Estimating opportunity to learn, then, is one part of the curricular alignment process. *Appendix C* contains a form for estimating opportunity-to-learn for a particular time period (e.g. unit, term or year), complete with directions for use and scoring.

Aligning activities and materials with standards requires that teachers understand the standards or objectives included in the unit (see discussion in previous section), and also understand which activities and materials are most likely to help students to achieve the stated standards. As mentioned earlier, a large proportion of current standards fall into one of three cells of the Taxonomy Table: remember factual knowledge, understand conceptual knowledge, or apply procedural knowledge. Fortunately, a great deal is known about teaching each of these three types of standards.

### *Teaching remembering factual knowledge*

Factual knowledge is knowledge that is remembered in exactly the same form in which it was encountered by the student. Examples include remembering how to do whole number multiplication,

remembering the major exports of countries, remembering how to spell words, and remembering the habitats of various types of animals. Almost anything included in a textbook or mentioned by a teacher is sufficiently important to be considered a standard of the form ‘remembering factual material’.

Because the universe of potential factual knowledge is so vast, one important aspect of teaching remembering factual knowledge is to focus students’ attention on the important factual knowledge. Teachers do this by using what are called ‘verbal markers’ (e.g. “Pay attention to this!”, “This is important!”, “Write this down!”, “This will be in the test!”). In textbooks, different fonts (e.g. bold print, italics) are used to indicate the specific information that is sufficiently important to be considered factual knowledge. Headings and sub-headings are used for a similar purpose.

Because the emphasis is on remembering, teachers should provide memory aids or strategies. Music (as in the alphabet song), mnemonic devices (as in “Every Good Boy Does Fine” to help students remember the lines of the treble clef in music), and graphic organizers (such as Venn diagrams and flow charts) are examples of memory aids. Rehearsal strategies (e.g. repeating the names of items in an ordered list), elaboration strategies (e.g. forming a mental image of a scene described by a poem), organizational strategies (e.g. grouping or outlining), and comprehension monitoring strategies (e.g. checking that what is being read is understood) are all memory strategies that can, and should, be taught to students when the focus is on remembering factual knowledge (Weinstein and Mayer, 1986).

Remembering factual knowledge is easily learned, but quite as easily forgotten. Therefore, it is necessary to remind students of the important factual knowledge from time to time. For example, primary school students cannot be expected to remember addition facts after completing a single learning unit. Rather, spending a minute or two at the beginning of each lesson following completion of the initial unit is likely to have more beneficial effects. Periodic review of important factual knowledge will also help the students to retain facts.

*Teaching understanding conceptual knowledge*

Conceptual knowledge involves categories and their relationships with each other, and is needed to give meaning to the words included in factual knowledge statements. The sentence “Horse racing has been known historically as the ‘sport of kings’” can be understood because each word or phrase (e.g. ‘horse racing’, ‘known’, ‘sport’) can be linked with an underlying concept. In contrast, the sentence “The gynk juped the fraunox” is incomprehensible because no such connections are possible.

Once formed, concepts can be linked in many ways. Connections between pairs of concepts are called ‘principles’ (e.g. “Round things roll”). As mentioned in *Chapter I*, sets of concepts and their interrelationships are referred to as conceptual frameworks. Concepts, then, provide the structure of the subject-matter and are also the basis for theories (e.g. the theory of plate tectonics, Piaget’s theory of moral development).

Because concepts are, in fact, categories, teachers should help students learn the characteristics or features that define the category. For example, “What makes a spider a spider?” Answer: eight legs, segmented body, exoskeleton. These are the defining features of the concept of a spider. That same question – “What makes X X?” – can be modified to include any concept (e.g. a sonnet, a revolutionary war, an irrational number, an impressionistic painting).

In many cases, it is difficult to identify the defining features of a concept. Consider the concept of an elephant, for example. It is far easier to recognize an elephant than it is to define one in terms of its physical features. In such cases, it is wise to take a more inductive approach to teaching to help students understand conceptual knowledge. In using an inductive approach, one begins with examples, and then moves to non-examples. Eventually, one includes ‘near examples’ (that is, examples that almost fit into the category, but do not). Through the presentation and discussion of examples, non-examples and near examples, students should come to an understanding of the concept(s) included in the standard.

Finally, it is wise to teach concepts in the context of other concepts rather than in isolation. Here the teacher's emphasis is on comparing and contrasting one concept with another, until an understanding of each concept and all concepts has been developed. Consider, for example, the concepts of a migrant, a tourist and an immigrant. Focusing on these concepts as a set will probably lead students to see that they differ in terms of: (a) the purpose for which a person is in a particular geographic location; and (b) the length of time the person has been there (or intends to be there). Connections between and among concepts contribute to enhanced understanding.

### *Teaching applying procedural knowledge*

Procedural knowledge is the knowledge of how to do something and is therefore typically found in standards that focus on applying (that is, using) knowledge. The 'something' to be done may range from completing fairly routine exercises to solving novel problems. Procedural knowledge often takes the form of a series or sequence of steps to be followed (i.e. first you do this, next you do that, etc.). Sometimes the steps are followed in a fixed order, while at other times decisions must be made regarding which step to take next. In either case, the steps constitute the procedure. In different subject-matters, procedures may be referred to by different names or labels. Among the most common are techniques, methods, skills and algorithms.

In teaching students how to apply procedural knowledge, it is important that students see the procedure as a whole. Thus, presenting the procedural knowledge visually is important. Visual presentations would include flow charts, check-lists and the like. Also, if decision points are included in the procedure, students must be taught the rules for making the decision (that is, when to do Step 3a and when to do Step 3b).

The use of worked out examples is a key feature of teaching applying procedural knowledge. Such examples enable students to see exactly where they are after completing each step in the process. These examples also show students that applying procedural knowledge is systematic; that is, they cannot jump around from step to step, nor

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can they skip steps along the way. Finally, worked out examples can include the reasoning behind doing Step 3a rather than doing Step 3b.

Finally, learning to apply procedural knowledge takes practice. Or to put it another way, one does not learn to apply procedural knowledge by watching others applying procedural knowledge. There are two different types of practice that are important in this regard. The first is 'guided practice', in which students' application of the procedure is closely monitored, and errors and mistakes are identified and corrected as early as possible. In independent practice, students apply the procedural knowledge on their own, independently of the teacher. The purpose of independent practice is to enable students to become increasingly efficient and competent in applying procedural knowledge.

### *Recommendations for teacher effectiveness*

Based on what is currently known about objectives, standards, and the structure of learning units, several recommendations can be offered to those interested in improving teacher effectiveness. These recommendations (and a brief discussion of each) are presented in the following sections.

- (i) *Teachers must have a sound understanding of the standards that define intended or expected student learning.*

The Taxonomy Table is a tool for increasing teachers' understanding of standards. It also emphasizes the need to understand standards and objectives in terms of student learning; more specifically, what knowledge the student is expected to achieve and what cognitive processes are to be learned together with that knowledge. Standards placed in the same cell of the Taxonomy Table mean the same thing in terms of intended student learning. For example, both 'The student will be able to correctly label the parts of a cell' and 'The student will recognize the symbols used to indicate the correct pronunciation of words' are standards that fall into Cell A1 of the Taxonomy Table, 'remember factual knowledge'. For this reason, the approaches to teaching and assessing these standards are likely to be the same (or very similar).

- (ii) *Teachers must use their understanding of standards to design appropriate and effective learning units.*

As mentioned several times previously in this booklet, current standards tend to fall into one of three of the cells of the Taxonomy Table. Fortunately, much has been learned about how to teach standards that fall into each of these cells. Based on the discussion earlier in this chapter, *Appendix D* contains a check-list of how best to teach these three types of standards.

Before moving on, an important distinction must be made between *what is* and *what ought to be*. Just because a large proportion of current standards *do* fall into one of the three cells of the Taxonomy Table does not mean that standards *should* fall into one of these three cells. In fact, the Taxonomy Table allows teachers and other educators to consider the wide range of possibilities of intended student learning outcomes. Some countries may have large numbers of standards which fall into the cell corresponding to ‘evaluate’ and ‘conceptual knowledge’. In this case, the conceptual knowledge consists of the criteria that are to be implemented in conducting the evaluation. These criteria would differ based on what is being evaluated (e.g. works of art, reasonableness of a solution to a problem), and for what purpose the evaluation is being done (e.g. judging the aesthetic value versus determining the proper size of a shipping box; effectiveness versus efficiency of the solution). In this situation, a check-list similar to the ones shown in *Appendix D* should be developed for this cell (and perhaps other cells) of the Taxonomy Table.

When similar check-lists are needed, it would be wise to convene a group of teachers who possess large amounts of relevant pedagogical content knowledge. When done well, these check-lists can provide a common understanding across teachers, as well as a brief blueprint for designing appropriate learning units linked to the identified standards or objectives. This shared understanding should help ensure that large-scale improvements in teacher effectiveness are made rather than attacking the problem of teacher ineffectiveness one teacher at a time.

All of these check-lists – the one included in *Appendix D* as well as those prepared by groups of expert teachers – summarize

the issues to which teachers should attend when preparing the learning units. To resolve these issues, however, teachers must adapt the check-lists to their circumstances (e.g. their students, working conditions). For example, it is important to include examples, non-examples and near examples in learning units which emphasize understanding conceptual knowledge. The specific examples, non-examples and near examples that are actually included in the unit would depend on the students being taught, the resources to which the teacher has access, and such factors.

*(iii) Teachers must be aware of the need for curriculum alignment – that is, the critical connection between the standards/objectives, the assessments, and the instructional activities and materials.*

Teachers can use the Taxonomy Table to estimate the overall degree of curriculum alignment and to identify areas in which alignment is less than desirable or optimal. Anderson (2002) recommended that a four-step procedure be used to estimate curriculum alignment. This procedure is based on the Taxonomy Table, and the four steps are the following:

First, each standard is reviewed and placed in its appropriate cell of a copy of the Taxonomy Table. Second, each instructional activity (and its accompanying support materials) is similarly placed in its appropriate cell of a second copy of the Taxonomy Table, based on clues provided by verbs and objects used to describe the activity. (Descriptions of activities also tend to take the SVO form.) Third, each assessment task (e.g. question or problem) is placed in the appropriate cell of a third copy of the Taxonomy Table. In the case of traditional tests, each item is considered an assessment task and placed appropriately. Then, the percentage of the items in each cell can be calculated. Fourth, the three completed Taxonomy Tables – one derived from the analysis of the standards, one from the instructional activities and materials, and one from the assessments – are compared.

Complete alignment is evidenced when there are common cells included in all three completed Taxonomy Tables. Partial alignment exists when the standards, activities and materials, and assessments

fall into the same row, for example, but differ in terms of the column in which they are classified (or vice versa). Partial alignment provides potentially useful diagnostic information to teachers who want to improve their curriculum alignment. Moving an instructional activity from having an emphasis on factual knowledge to having an emphasis on procedural knowledge, or from understanding to analyzing, may be worth the effort if alignment is improved substantially as a result.

There is increasing evidence that estimating curriculum alignment based on *both* knowledge and cognitive processes is superior to other methods of estimating alignment. As Gamoran *et al.* (1997: 331) pointed out: “To predict student achievement gains from knowledge of the content of instruction, a micro-level description of content that looks at cognitive demands by type of knowledge is the most useful approach considered to date.”

Finally, alignment using the Taxonomy Table is based on considering what teachers intend in terms of student learning, not on the topics or content areas being taught. This is particularly important to keep in mind when analyzing instructional activities and materials. When examining activities, one must ask: What is the student supposed to learn from his or her participation in this activity? What knowledge is to be acquired or constructed? What cognitive processes are to be employed? Continued focus on the student makes it more likely that the learning unit will be effective.

### *Recommendations for policy-makers and educational planners*

Understanding standards and objectives and using them to design and implement effective learning units are two early steps in moving towards increased teacher effectiveness. Standards and learning units are the bedrock upon which all of the other aspects of teacher effectiveness must be built. In classrooms with high levels of student engagement, but meagre academic content, students learn little (Weade and Evertson, 1988). Policy-makers and educational planners wishing to improve teachers’ understanding of standards and help teachers design and use appropriate learning units are encouraged to consider the following recommendations.

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- (i) *When external tests or examinations are used to examine or evaluate teacher effectiveness, estimates of opportunity to learn should be made routinely. If the estimates are low, then efforts must be made to increase opportunity to learn so that the effects of other aspects of teacher effectiveness can be accurately determined.*

As mentioned earlier, opportunity to learn is an element of curriculum alignment. However, it is also important in its own right, particularly when external, high-stake examinations are used to estimate or evaluate teacher effectiveness. If *what* students are being taught is not being tested, then our attempts to estimate *how well* it is being taught are misguided and futile. The reason for this is quite simple: the result of *excellent teaching* of content *not included* in the external examination will be very similar to the result of *poor teaching* of content *included* in the external examination. To obtain accurate estimates of teacher effectiveness, then, a high level of opportunity to learn is absolutely necessary. Instruments such as the one included in *Appendix C* can be used fairly routinely to estimate the level of opportunity to learn.

- (ii) *Teacher guides should be organized around learning units, with careful attention given to the alignment among standards, instructional activities and materials, and assessments.*

In terms of planning, focusing on learning units offers four advantages over focusing on daily lessons. First, learning units provide the time needed to teach students the relationships between the standards included in the units. In this way, students can, over time, be helped to see important connections between ideas, materials, activities and topics; that is, the unit structure helps them to see the forest as well as the trees.

Second, learning units provide teachers with greater flexibility in their use of available time. If a teacher runs out of time on a particular day, the activity can be carried over to the next day. This flexibility of time use is important because activities do not always go as planned, nor do students learn in a linear, lock-step fashion. In addition, it is

quite likely that some students will need more time to learn than others. Learning units allow teachers to accommodate these classroom realities.

Third, learning units provide a context for interpreting the events of individual lessons. For example, understanding the concepts of ratios and proportions is likely to be greater in the context of a unit on sculpture than when included as individual, de-contextualized lessons. Similarly, the importance of lessons on writing different types of sentences is often better understood within the context of a unit on writing short stories.

Fourth, learning units, because of their length, provide greater opportunity to develop and assess learning of the more complex standards; i.e. standards that include cognitive processes such as evaluate or create, and/or metacognitive knowledge. Students generally require more time to learn higher-order cognitive processes and absorb metacognitive knowledge.

Within the context of learning units, then, alignment need not be standard-by-standard, or activity-by-activity, or test item-by-test item. Rather, the Taxonomy Table can be used to examine the relationships among sets or clusters of standards, sets or clusters of activities and materials, and sets of items included in one or more assessment instruments.

*(iii) Plan and offer workshops to help teachers learn how to teach well within a standards-based curriculum.*

There is ample evidence that large numbers of teachers begin their planning with classroom activities (e.g. what they want their students to do) rather than with standards (e.g. what they want their students to learn) (Peterson and Clark, 1986). From a teacher's perspective, classroom activities may be more important than standards. They are concrete, under teacher control, and keep students busy (therefore serving a classroom management function). In contrast, standards are abstract and, from a learning perspective, under student control. In addition, standards-based units may lead to problems of classroom management because it is likely that some students will achieve the standards more rapidly than others.

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Because of the propensity of teachers to live and work in an activity-based world, the changeover to a standards-based curriculum will not be easy. Teachers must learn how to make the change, be made to feel comfortable with the change, and be helped to see that the change does, in fact, support increased teacher effectiveness. Skill, comfort and observable results, then, are the keys to helping teachers to teach well using a standards-based curriculum.

### III. Classroom environment, climate and culture

Throughout the world, most teaching takes place in classrooms. Typically, these classrooms are occupied by 20 or more students and a single adult: the teacher. In developing countries, class sizes in primary schools average 50 students, and can sometimes be as large as 100 (Siniscalco, 2002). The ratio of one teacher to a much larger number of students results in a natural imbalance between teaching and learning. When teachers teach in classrooms, they must, by necessity, direct a great deal of their teaching to large groups of students, quite often the entire class. Even when they work with individual students or small groups of students, they must be aware of what other students in the classroom are doing. What students learn from this predominantly group-oriented teaching method, on the other hand, depends to a large extent on the unique characteristics brought to the classroom by the individual students. As mentioned in *Chapter I*, the best predictor of what students know and can do at the end of a certain period of schooling is the knowledge and skills with which they entered that period of schooling. Thus, while teaching is group-based, learning is clearly an individual matter.

Since most teachers teach in classrooms, the physical aspects of these classrooms and the perceptions of these classrooms by their students can either enhance or constrain their effectiveness. If they are to reduce the imbalance between teaching and learning, teachers must create classrooms that are conducive to both effective teaching *and* effective learning. In creating such classrooms, teachers can alter or manipulate the physical environment, the psychological environment, or both.

Physical environments exist independently of the people who inhabit them. When you walk into an empty classroom, you are looking at the physical environment. Because it exists independently of people, the physical environment of the classroom can be manipulated rather easily. Desks, chairs and tables can be arranged in a variety of ways.

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Paint, wall coverings, artwork and plants can be used to enhance the attractiveness of the physical environment. Equipment, books and other materials can be added to increase the learning opportunities within the physical environment.

Unlike physical environments, psychological environments exist only in the minds of those who live in these environments. If several students were asked to describe (or draw) the physical environment of a classroom, their descriptions (or drawings) would probably be quite similar. If these same students were asked to describe the psychological environment of the same classroom, their descriptions may differ greatly. One student may see it as a warm and inviting place, while another may see it as cold and exclusionary. These differences in students' perceptions of the classroom climate, when they exist, make classroom teaching much more difficult.

To facilitate the task of classroom teaching, teachers need to create a psychological environment that is perceived *positively* and *similarly* by students. A positive classroom climate is necessary in order to bring out the best in students. Similar (or shared) perceptions are needed to create a meaningful, workable classroom culture. The culture of the classroom is the system of beliefs, values, and modes of construing reality that is shared by the teachers and the students. The classroom culture defines the standards for perceiving, believing, acting and evaluating the actions of those in the classroom (Goodenough, 1981). Thus, while *classroom climate* deals with the psychological environment of the classroom as it *is perceived* by individual students, *classroom culture* deals with the psychological environment as it *should be perceived* by all of the students in the classroom.

This chapter will deal with the differences between the physical and psychological environment of the classroom, examine what is known about the relationship between these two types of environment, and discuss the importance of creating a positive classroom culture. The chapter ends with a set of recommendations for the improvement of the overall classroom environment.

### *The physical environment*

The physical environment of the classroom includes variables such as the way in which the classroom is arranged (Bennett, 1987), the equipment and materials that are placed in the classroom (Ainley, 1987), the number of students and adults in the classroom (Glass, 1987), and the way in which students are seated or otherwise arranged in the classroom (Weinstein, 1987). Perhaps the best description of the relationship between physical environments, teaching and learning is the one offered by Ainley (1987: 539-540):

“In the current research literature there is little consistent evidence of a strong effect of the materials and equipment in schools on achievement ... There is, however, available a substantial amount of evidence that the physical environment of a school or classroom can affect the behaviour of people and their attitudes toward school and learning.”

As mentioned in *Chapter I*, then, the physical classroom environment indirectly impacts on student learning. That is, the physical classroom environment influences those who inhabit the classroom (both teachers and learners), who, in turn, influence what and how much students actually learn.

Many of the elements of the physical environment that influence those who occupy the classrooms and which have been identified through research border on common sense. When the teacher is presenting information to an entire class of students, each student should have an unobstructed view of the teacher or of the information presented by the teacher. When students are expected to engage in discussion with other students, the physical arrangement of the classroom should facilitate (e.g. circular arrangements) rather than inhibit (e.g. static row and column arrangements) this discussion. When materials and equipment are needed, they should be readily available and in good working order.

Despite the common-sense notions associated with the physical classroom environment, there is ample evidence that differences between classrooms in terms of their physical environments do exist,

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particularly in developing countries. Furthermore, the relationship between these differences in the physical environment and differences in student learning is especially clear in these countries. Fuller (1986), for example, suggested that the availability of desks had a direct relation to increased student learning. Similarly, Farrell (1989: 63) found that “children ... who have access to textbooks and other reading material learn more than those who do not and ... the more books they have the more they learn”. On the same note, Elley (2001) concluded that the provision of large numbers of high-interest, illustrated books (a ‘book flood’) results in children reading more, better and faster.

## *Classroom climate*

In contrast with the indirect influence of the physical classroom environment on student learning, classroom climate can influence student learning (as defined in *Figure 1*) directly. In this regard, Walberg (1987) suggested that differences in classroom climate account for approximately 30 per cent of the variance in cognitive, affective and behavioural outcomes of schooling, beyond the variance accounted for by input measures such as ability at the time of entering the school or achievement. Walberg further suggested that three components of classroom climate have been found to be consistently related to student learning: affect, task and organization. When combined, these three components suggest that effective teachers are able to create classrooms that students perceive to be inviting, task-oriented and well organized. Each of these is considered in turn below.

*Inviting classrooms* are those in which students perceive there to be mutual respect between teachers and students, and where there are positive and co-operative relationships and a sense of overall satisfaction among the students. *Task-oriented classrooms* are those in which students perceive there to be definite goals to pursue, and believe that they are held accountable for achieving these goals. In addition, a large proportion of classroom time is spent working towards achieving these goals. Finally, *well organized classrooms* are those in which students believe that expectations for behaviour and learning are made explicit, and an appropriate structure is provided by the teacher to guide behaviour and learning. The third component – organization – is described in greater detail in *Chapter IV*.

More recently, Baek and Choi (2002) reported on the results of a study conducted in the Republic of Korea using the Korean Classroom Environment Scale (KCES). Like Walberg, the KCES also contains three dimensions: relationships (involvement, teacher support, affiliation); goal orientation (task orientation, competition); and system maintenance and change (order and organization, rule clarity, teacher control, innovation). There are certain parallels between the KCES and Walberg's model (e.g. task-orientation is a sub-set of goal-orientation; classroom organization is a sub-set of system maintenance and change). In general, the KCES dimensions tend to be broader than those identified by Walberg. None the less, the results of the Baek and Choi study in terms of the relationship between classroom climate and student achievement are very similar to those reported by Walberg.

Based on a large-scale study in the United Kingdom, Hay McBer (2000) identified a set of nine factors that define an effective classroom climate. These factors are clarity, fairness, interest, order, participation, physical environment, safety, standards and support. As can be seen, there is a substantial overlap of these factors with those identified by Walberg and by Baek and Choi.

### *Classroom culture*

As mentioned earlier, classroom culture can be defined in terms of shared values and beliefs. To the extent that inviting classrooms, task-oriented classrooms and well-organized classrooms are valued by all in the classroom, these features become part of the classroom culture. The elements that help define the classroom culture include the roles and responsibilities of students and teachers, the relationships between teachers and students and among students themselves, and the importance and nature of learning. If teachers continuously talk while students are expected to sit quietly and listen, these roles soon become part of the classroom culture. If students are supposed to treat others with respect, this expectation becomes part of the classroom culture. If completing work on time is more important than the quality of the work submitted, this too becomes part of the classroom culture.

One attempt to define an appropriate classroom culture has been made by researchers working within the framework of the Accelerated Schools model (Finnan and Swanson, 2000). They conceptualize effective classroom cultures in terms of Powerful Learning Environments. Powerful Learning Environments are composed of 15 dimensions, as summarized in *Box 1*.

**Box 1. Fifteen classroom dimensions associated with powerful learning environments**

**In the classroom**

1. There is a sense of mutual respect among students and between the students and the teacher (mutual respect).
2. Diversity is considered a strength to be built upon rather than a problem to be solved (diversity).
3. Procedures have been internalized and responsibilities accepted by students (behavioural self-control).

**The curriculum**

4. Contains content and problems that relate to the world outside the classroom and connect new learning to what students already know and have experienced (authenticity).
5. Is interdisciplinary and thematic, emphasizing connections across subject areas (integrated curriculum).

**Instruction**

6. Takes the form of a dialogue between teacher and students (instruction as dialogue).
7. Is structured to engage all learners (inclusive instruction).
8. Provides opportunities for learners to construct their own knowledge through experimentation, exploration and discovery (active knowledge construction).

**Learning**

9. Emphasizes conceptual knowledge and making sense of important ideas (meaningful learning).
10. Enables students to perceive knowledge in a holistic way (connectedness).

**Teachers**

11. Develop a deep understanding of their students (understanding students).
12. Are 'learning leaders', transmitting passion for ongoing learning and explicitly modelling how to learn (learning leaders).

**Students**

13. Are actively involved in the process of learning, rather than being passive recipients (involvement in learning).
14. Work collaboratively and productively with one another (co-operation).
15. Develop a sense of empowerment through learning (empowerment).

As shown in *Box 1*, these 15 dimensions form a comprehensive description of classroom culture, one that includes concerns for the classroom, the curriculum, instruction and learning, and teachers and students. There is an emphasis on mutual respect, behavioural self-control, authentic learning, inclusive instruction, teachers as learning leaders, and students as empowered learners. Preliminary evidence suggests that students' achievement is greater within this type of classroom culture (Finnan *et al.*, 2003).

The importance of shared values and beliefs in effective teaching has also been highlighted by Hill and Crévola (1997). Among the most important values and beliefs that they identified were: (a) the belief in the ability of all students to achieve high standards when given sufficient time and support; and (b) a belief among teachers in their own efficacy (that is, that they *can be* successful in teaching the students that they are assigned to teach).

Finally, the importance of attending to classroom culture has been emphasized by Alton-Lee *et al.* (1993: 82-83): "To focus on the instructional dimension without attending to the lived culture of the classroom context make invisible some of the most significant questions about both the learning and the well-being of children in classrooms."

## *Assessing the classroom environment*

Several instruments have been developed to assess classroom climate. Four of the most technically sound instruments are the Learning Environment Inventory (Fraser, 1978), the My Class Inventory (Walberg, 1974), the Classroom Environment Scale (Trickett and Moos, 1973), the Individualized Classroom Environment Questionnaire (Rentoul and Fraser, 1979), and the Korean Classroom Environment Scale (Baek and Choi, 2002). The Korean Classroom Environment Scale is particularly instructive since it illustrates both the feasibility and necessity of adapting learning environment inventories for use in specific countries.

*Appendix E* contains a set of eight rating scales developed by Emmer *et al.* (1982) that are useful in assessing the physical and psychological environment of the classroom. *Appendix F* contains brief written descriptions of each of the eight scales. The first three scales are related to the physical environment of the classroom, the second three scales are related to the task orientation of the classroom, and the final two scales are related to the general affective dimension of the classroom. As mentioned earlier, scales related to the organization of the classroom are included in the next chapter.

*Appendix G* contains a rating scale designed to evaluate the extent to which classrooms are Powerful Learning Environments. *Appendix H* contains brief written descriptions of all 15 scales.

The rating scales included in *Appendix E* and *Appendix G* are intended to be used by independent observers in the classroom (e.g. policy-makers, administrators, supervisors, researchers). However, they can be completed by older students or the teachers themselves as they reflect back on their lessons. These scales are not as psychometrically sound as those mentioned earlier. They are, however, useful for practitioners and are linked to the recommendations offered in the closing section of this chapter.

One final point must be made before moving on to the next section. The standardized classroom climate instruments mentioned earlier in

this section can be used to provide relevant information about the classroom culture. Differentiating classroom climate from classroom culture would simply require that the assessment results be examined differently. When the emphasis is on the classroom climate, the focus of the examination would be the mean scores or ratings. Variations in the scores or ratings would be seen as differences in students' perceptions of the classroom. When the emphasis is on the classroom culture, however, the focus would be primarily on the variability in the scores or ratings, and secondarily on the mean scores or ratings. Lower variability would indicate more common perceptions and, hence, the likely existence of a meaningful, workable classroom culture.

### *Recommendations for teacher effectiveness*

Based on what is currently known about classroom environment in relation to teacher effectiveness, three general recommendations can be given to those interested in improving teacher effectiveness in this area. These recommendations (and a brief discussion of each) are contained in this section.

- (i) *Teachers should create attractive and functional classrooms. Part of the functionality of classrooms concerns the availability of the necessary equipment and materials.*

Stated simply, unattractive and dysfunctional classrooms are detrimental to teacher effectiveness. Effective teachers use colour, light, temperature and displays to create attractive and inviting classrooms. Proper arrangement of furniture also contributes to the good functionality of classrooms. Furniture is arranged so that students are oriented towards the primary source or sources of information (e.g. the teacher, audio-visual equipment), while at the same time having access to other sources or activities (e.g. work areas, computers) without disturbing others in the classroom. The importance of attractive and functional classrooms has been demonstrated quite clearly in an experimental study undertaken in Thailand (Nitsaisook and Anderson, 1989).

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- (ii) *Teachers should create a classroom environment that is warm, yet businesslike. This requires that equal emphasis be placed on the academic and socio-emotional needs of the students.*

Task-oriented classrooms are characterized by many educators and researchers as being 'businesslike'. That is, both the teachers and the students have a job to do. How the teachers and students perform vis-à-vis their jobs, and the accomplishment of objectives associated with this performance, are paramount in the minds of both the students and the teachers. From a teacher effectiveness perspective, learning is the *raison d'être*.

This recommendation does not mean that the life of teachers and students in classrooms should be all work and no play. On the contrary, in task-oriented classrooms there is ample opportunity for both work and play, since the emphasis is on what is being accomplished rather than on what is being done.

Furthermore, positive and supportive human relations are a critical part of productive classroom environments. Teachers need to help students understand that they can learn and, in fact, that they are expected to learn, and to learn well (Avalos and Haddad, 1981; Good, 1987). Teachers must treat all students fairly. One important example of fair treatment is the definition of academic excellence in terms of objective standards, not by peer comparison. In other words, students should be rewarded based on their achievement of objectives, not based on their performance in relation to other students. Finally, teachers must engage in honest communication with their students. If they do not know the answer to a question raised by a student, they should simply say that they do not know the answer (rather than bluffing an answer). When students are talking, teachers ought to be genuinely interested in what their students are saying (rather than appear to be listening when in fact their minds are elsewhere).

- (iii) *Teachers should work diligently to establish a classroom culture based on explicit values and beliefs. These values and beliefs should provide the basis for the way in which teachers and students relate to one another, as well as the expectations for behaviour, effort and learning.*

*Box 1* contains what might be considered a ‘starter set’ of such values and beliefs. They should be modified as needed to conform to the larger culture in which schools and classrooms are embedded. Quite clearly, there must be a substantial overlap of classroom culture, school culture and national culture.

Having explicit values and beliefs that define the classroom culture is more important than the particular values and beliefs endorsed and shared. At the same time, however, it must be recognized that there are certain values and beliefs associated with more effective teachers: A focus on meaningful learning, a concern for mutual respect, a belief in the worthiness of all children, being relentless in the pursuit of excellence – these are some of the hallmarks of the classroom culture that effective teachers create.

### *Recommendations for policy-makers and educational planners*

Appropriate physical and psychological environments are necessary if teachers are to be as effective as possible. The following recommendations are intended to help policy-makers and educational planners to make it possible for teachers to create and maintain such environments.

- (i) *Policy-makers and educational planners must ensure that teachers have the resources they need to create attractive and functional classrooms.*

The results of several studies conducted in developing countries have supported the educational value of the availability of textbooks and reading materials, the size and quality of the library, and the

quality of the school building (Fuller, 1986; World Bank, 1990; Department for International Development, 1997; Elley, 2001). Equally important, however, is the fact that a lack of several of these resources will limit what teachers can do in their efforts to become more effective. Farrell (1989: 63) has elaborated on this point:

“There is ... some indication that the availability of books allows teachers to assign homework, one of the ‘promising possibilities’ for raising student achievement. Beyond this, there is some observational evidence that the presence of textbooks in the classroom allows teachers to diversify their teaching repertoire and work with small groups and individual students. In a classroom with no books, about the only teaching-learning style possible is teacher lecture and group recitation and rote memorization.”

(ii) *Once adequate resources have been made available, teachers must be advised on how best to use these resources to create appropriate classroom environments.*

Simply providing resources is not enough. In this regard, Elley (2001) has suggested that placing large amounts of interesting, comprehensible printed material in classrooms is only the first step in improving literacy. Two additional steps, or conditions, are needed: (a) students must have frequent access to books, either through the use of book boxes in the classroom or through class libraries; and (b) teachers must be shown simple ways of ensuring that the students interact with the books in highly motivating conditions.

Achieving these conditions normally requires a series of short workshops where teachers are shown “how to read the stories aloud, how to share them with the pupils, and how to conduct follow-up activities to help the pupils learn the language of the books” (Elley, 2001: 130).

In industrialized countries, computers have been placed in schools at a very rapid rate. However, there is increasing evidence that these computers are often under-utilized (Van Dusen and Worthen, 1995) or used relatively ineffectively (Newsom, 1996). For many teachers, computer technology is still perceived as an ‘add-on’ to the educational

process rather than being central to the educational mission. Often that means that computers are used primarily for reward and remediation. These are valid uses, but are peripheral to the main curriculum. Giving the teacher continuous, immediate and supported access to computers is necessary for creating the potential for deep and sustained changes.

(iii) *Departments of teacher education should emphasize the importance of classroom culture in improving teacher effectiveness. Courses, workshops and seminars should be offered, which help teachers understand the benefits of appropriate classroom cultures as well as how to establish such cultures.*

Teaching in a classroom in which shared values and beliefs exist greatly facilitates the task of the teacher. When the norm is for students to assume responsibility for their own behaviour, for example, teachers can shift their attention away from *managing learners* to *managing learning*. Similarly, when the norm is mutual respect, teachers can move away from rule-driven classroom management to relationship-driven classroom management (Vitto, 2003). Finally, ‘authenticity’, ‘connectedness’ and ‘meaningful learning’ (see *Box 1*) when combined help students to see the relevance of the objectives which they are striving to attain. Relevance, in turn, is likely to produce higher levels of student involvement or engagement in learning (see *Chapter VII*).

Despite the utility of a meaningful, supportive classroom culture, teachers need both knowledge and skills in order to create and sustain such a culture. Courses, workshops and seminars are the most likely vehicle by which teachers acquire the necessary knowledge and skills.



## IV. Classroom organization and management

In the previous chapter, the importance of establishing a physical environment and a classroom culture that support and facilitate student learning was discussed. In this chapter, the focus is on ways in which teachers can organize classrooms to promote effective teaching and learning, and manage the large numbers of relatively diverse students who occupy these classrooms.

Classroom organization refers to the academic and social arrangements of students within classrooms. Classrooms can be composed of students who are either similar or quite different in terms of their ability, achievement, motivation and the like. Within their classrooms, teachers can teach or work with the entire class of students, smaller groups of students, or individual students. Also, within the classroom, students can be expected to work on their own or with other students in so-called 'co-operative groups' (Johnson and Johnson, 1989; Slavin, 1987).

In contrast with classroom organization, classroom management pertains to the ways in which teachers promote positive, co-operative and task-oriented behaviour and deal with misbehaviour and disruptive behaviour. In this regard, two key aspects of classroom management have been identified: preventing behavioural problems from occurring, and reacting to behavioural problems once they have occurred. The latter aspect is often referred to as 'discipline'.

The importance of classroom organization and management within the larger context of teacher effectiveness is most clearly seen by noting that beginning or novice teachers spend large amounts of time on classroom organization and management (Ryan and Phillips, 1982; Berliner, 1988). Furthermore, in many countries, this increased amount of time dedicated to organization and management has been found to be detrimental to student learning (Anderson *et al.*, 1989). Thus, one may reasonably conclude that until novice teachers are

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able to properly organize their classrooms and manage their students, they are unable to focus their attention and efforts on the teaching-learning process. As a consequence, their efforts to increase their effectiveness as teachers are limited.

### *Classroom organization*

As mentioned in the previous chapter, teaching and learning throughout the world occur in social settings called classrooms. Some of these classrooms are composed of students who are very similar to one another in terms of their abilities, prior achievement, and a variety of other characteristics. Such classrooms are labelled 'homogeneous classrooms', and the practice of assigning students to such classrooms is referred to by a variety of names: ability grouping, streaming and tracking (Gamoran, 2002). Other classrooms contain students who are very dissimilar in terms of their abilities, prior achievement and other characteristics. These are termed 'heterogeneous classrooms'.

A great deal of research comparing the relative effectiveness of homogeneous and heterogeneous classes on student achievement has been conducted, the results of which can be summarized fairly simply. The achievement of less academically able students in homogeneous classes tends to be below that of less academically able students in heterogeneous classes (Gamoran, 2002). On the other hand, the achievement of more able students in homogeneous classes tends to be either similar to (Slavin, 1987) or higher than (Kulik and Kulik, 1988) that of more academically able students in heterogeneous classes. Therefore, in schools that practice homogeneous grouping, differences in the achievements of more and less academically able students increase throughout the years of schooling (Gamoran, 2002). Based on these results, Oakes (1985) argued that such schools "structure inequality".

Actually, the results of the research comparing student achievements in homogeneous and heterogeneous classes are not as obvious as they appear at first glance. As indicated in *Chapter I* (see *Figure 1*), the influence of classroom organization and management on student achievement is *indirect, not direct*. The disparities in achievements mentioned in the previous paragraph are

more likely to be attributed to the ways in which low- and high-ability students are treated when placed in homogeneous groups versus heterogeneous groups than to group membership *per se*. Hallinan (1984), for example, concluded that lower-ability students in homogeneous groups tended to: (a) receive instruction at a slower pace; (b) have more time off-task for administrative or managerial reasons; and (c) be taught using materials that were less interesting than those used to teach similar students in heterogeneous groups. In contrast, Kulik and Kulik (1988) suggested that one of the keys to the success of high-ability students in homogeneous classes was that the curriculum was accelerated for these students. That is, they were presented with more difficult and complex content and were taught at a more rapid pace than less able students.

Regardless of the composition of the classroom in terms of diversity among students, teachers can organize their classrooms in one of three ways for instructional purposes: whole class, small groups, or individual students. There is ample evidence that whole class instruction is predominant worldwide (see, for example, Anderson *et al.*, 1989). Interestingly, this is true regardless of the number of students in the classroom (Anderson, 2000). Within a whole class organization, the primary role of the teacher is to present information, demonstrate procedures and ask questions.

In most industrialized countries, the next most frequently applied classroom organization is individual student organization. That is, individual students are given assignments (e.g. to read a story or complete a worksheet) that they are to do in their seats or at their desks or tables (Anderson, 1994; Clarke and Suri, 2003). Within an individual student organization, the role of the teacher is to circulate among the students, monitoring their work and providing assistance as needed.

The third type of classroom organization is the formation of small groups. However, just because students are placed in groups does not mean that they are expected (or allowed) to work together. As Galton *et al.* (1980: 70) pointed out in their study of primary schools in England, “though children are typically seated in groups, for the great majority of time they work as individuals, concentrating on their own individual tasks”.

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When students are placed in groups and encouraged to work together, these groups are called 'co-operative learning groups' (Johnson and Johnson, 1989; Slavin, 1996). In co-operative learning groups, students are given a common task, assigned various roles and responsibilities, and left (relatively) alone to complete the task. The role of the teacher in this classroom organization is to introduce the task, ensure that the instructions are understood by the students, ensure that each group has sufficient materials and equipment to complete the task successfully, and serve as a resource as needed by the groups as they go about completing the task.

Effective teachers see all three classroom arrangements as useful tools and tend to provide a balanced combination of each of them, utilizing whole class instruction, individual student work, and co-operative learning as needed to fulfil the various learning goals. Too much individual seatwork in particular has been associated with lower levels of student achievement (Fisher *et al.*, 1980; Anderson, 1994).

## *Classroom management*

As mentioned earlier in this chapter, classroom management can be divided into two categories: *preventive* and *reactive*. Research conducted during the past decades in the United States clearly suggests that more effective classroom managers differ from less effective classroom managers in their ability to prevent problems from occurring, not in their ability to react successfully to behavioural problems when they occur (Doyle, 1986; Evertson and Randolph, 1999). The establishment of rules and routines and the use of certain teacher behaviours are two factors associated with effective preventive classroom management.

In general, rules are prohibitions on student behaviour and, as a consequence, are often stated negatively. "Do not talk without raising your hand" is a rule used by teachers in many schools in the United States. Routines, on the other hand, are sequences of steps which students are to follow as they perform classroom activities that occur with some degree of regularity. Routines established by teachers in many classrooms include those for entering and leaving the classroom,

participating in class discussions or conversations with the teacher, completing and submitting homework, and taking quizzes and tests.

In order for rules and routines to be effective, they must be planned in advance, be relatively few in number, be communicated clearly to students (along with justification of why they are needed), and have explicit consequences if they are not respected. At least initially, compliance with the rules and routines must be monitored, praise should be given as appropriate to those students who do comply, and sanctions or punishments consistently meted out to those who do not. Because of the importance of rules and routines in overall classroom management, they must be introduced and put into practice very early on in the school year. The results of several studies have indicated that it is of great importance during the first two weeks of school to establish the expectations vis-à-vis student behaviour in the classroom (Evertson, 1989; Evertson and Emmer, 1982). Eventually, explicit and meaningful rules and routines should enable students to behave appropriately without direct teacher supervision and intervention. As Good and Brophy (1987: 228) have suggested, “the teacher’s goal is to develop students’ inner self-control, not merely to exert control over them”.

A set of teacher behaviours associated with preventive classroom management – first identified by Kounin (1970) – has been validated by numerous other studies over the past three decades (Evertson and Randolph, 1999; Wang *et al.*, 1999). These behaviours include ‘with-it-ness’ (constant awareness of everything that is happening in the classroom at all times), ‘group alerting’ (using a standard and predictable signal to get students’ attention), ‘overlappingness’ (the ability to deal effectively with more than one matter at the same time), ‘momentum’ (keeping events and activities moving at a fairly brisk pace), ‘accountability’ (letting the students know that they themselves are responsible for their learning and the quality of their work), and ‘providing variety and challenge in seatwork’ (setting assignments that provide a sufficient element of challenge and variety to maintain the students’ interest and attention). Many of these behaviours were included in a successful teacher training programme developed in Indonesia (Djalil and Anderson, 1989).

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Before moving to the recommendations for this chapter, a final comment on classroom management is in order. Both the need for classroom management and an appropriate approach to classroom management are likely to differ according to the country. Students in many developing countries, for example, tend to be better behaved and less disruptive than students in industrialized countries (Anderson *et al.*, 1989). Consequently, there may be less need for classroom management in these countries.

Similarly, developing a classroom management system is not merely a matter of enacting a few rules and routines. Careful thought must be given to the rules and routines endorsed, that they be appropriate within a given cultural context, and that they be most likely to serve the students' needs and facilitate effective teaching. As Evertson and Randolph (1999: 264) emphasized: "Classroom management must not be seen as an end in itself, but as a contributing factor in student learning".

## *Recommendations for teacher effectiveness*

In this section, separate recommendations are made for classroom organization and classroom management. Since the majority of these recommendations are self-explanatory, they are simply listed. Any explanation that is thought to be needed is included in the statement of the recommendation itself. Also, because assignment of students to classrooms is an administrative or a policy matter, the issue of placing students in heterogeneous or homogeneous classes is reserved for the final section of this chapter.

### *Classroom organization*

1. When introducing new content to students, whole class instruction, actively led by the teacher, is preferable to small group or individual student instruction. This does not necessarily mean that the mode of instruction must be one where the teacher talks while the students listen. Assigning a problem or posing a question and having students work through it to find the solution or answer under teacher supervision can be an effective method (Shimizu, 2002).

2. Co-operative learning groups should be formed within the classroom as needed to achieve particular objectives. Co-operative learning groups are particularly useful when the objectives focus on expressing and defending opinions, presenting logical arguments and solving problems. When co-operative learning groups are formed, the composition of each group should be heterogeneous in terms of prior achievement and other relevant student characteristics. Also, the content and assignments given to students in each group should be challenging and presented at an appropriate pace. If errors in challenge and pace are made by the teachers (as is likely to happen from time to time), this error should be on the side of greater challenge and a more rapid pace.
3. When working with individual students or small groups, teachers must remain aware of the rest of the students in the class, taking action as necessary to keep them involved in learning and their minds on the task. One of the keys to achieving this goal lies in the assignments given to the other students. These assignments should be sufficiently challenging and interesting, with identifiable and clearly understood outcomes or products (e.g. solutions to problems, a constructed model or diagram). Such assignments possess what Kounin and Sherman (1979) refer to as 'holding power', since they apparently hold the students' attention on the task at hand without the direct involvement of the teacher.

#### *Classroom management*

1. Standards for appropriate, pro-social classroom behaviour should be communicated to students at the beginning of each term or year. With younger students, direct teaching of the standards is likely to be needed. Eventually, students should be able to internalize the expectations that teachers have regarding their behaviour, and demonstrate appropriate behaviour without the direct supervision of, or intervention from, their teachers. It is critical that these 'social lessons' (Evertson and Randolph, 1999) be learned early on because of their relationship with the 'academic lessons' that make up the curriculum and lead to achievement of the intended learning outcomes by the students. Stated somewhat more negatively, problems with the social lessons will probably result in problems with the academic lessons in the long run.

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2. Teachers should reinforce positive, pro-social behaviour, especially with students who have a history of behavioural problems. Such students need to see value in behaving appropriately. Praise and approval by teachers and peers are ways of helping these students to value positive, pro-social behaviour.
3. Consistent, equitable sanctions and punishment for inappropriate behaviour should be administered to all students who do not comply with behavioural requirements. In such cases, prompt action should be taken and must be clearly linked to specific behaviour. When sanctions and punishment are necessary, the teacher should emphasize the inappropriate *behaviour*, not the student's *personality* (e.g. "You didn't turn in your homework" rather than "You are lazy").
4. Teachers should keep the amount of non-instructional time in classrooms to a minimum by beginning and ending lessons on time, maintaining the flow of classroom activities (keeping transitions between activities), maintaining a fairly rapid pace, and implementing meaningful and efficient rules and routines. Maintaining both a steady flow and a rapid pace are particularly useful because, when combined, they reduce the opportunities for student misbehaviour.
5. Teachers should convey to their students that they: (a) are constantly aware of what is going on in the classroom (with-it-ness); (b) are able to handle several tasks or activities at the same time (overlappingness); (c) are not likely to be distracted from the primary purpose of the lesson that they are conducting (momentum); and (d) expect students to be responsible for their learning and the quality of their work (accountability). Teachers can convey these things in many ways; however, as in many situations, actions speak louder than words, and the best way to let students know that teachers can handle several matters simultaneously is to do so.

### *Recommendations for policy-makers and educational planners*

As policy-makers and educational planners work towards increasing teacher effectiveness, they should keep in mind the purposes

or goals of classroom organization and management. Decisions concerning classroom organization are made primarily to deal effectively with the diversity of students in the classroom (Barr and Dreeben, 1983) and the various objectives that are being pursued (Doyle, 1986). In this regard, decisions made at the school level impact on decisions made by classroom teachers. For example, a school-level decision to form heterogeneous classrooms means that teachers must find ways of organizing their classrooms to deal with the heterogeneity. In general, the greater the diversity among students in a classroom, the more likely it is that teachers will need to form cooperative learning groups or work with small groups of students (three or four) on certain occasions if they are to effectively teach all of the students in the classroom.

In contrast to decisions concerning classroom organization, decisions concerning classroom management are made primarily to maximize the productive use of available time and to create conditions that are otherwise conducive to accomplishing the learning objectives. Recent research confirms the close link between classroom management, instruction and learning (Evertson and Randolph, 1999). Furthermore, rather than being a necessary pre-condition for instruction to take place, classroom management, when combined with instruction, communicates to students the “rules for interacting with content and with each other ... It is important to consider both the academic and social lessons being taught and learned in any given classroom at any given time, and to recognize that these messages inevitably influence each other, and cannot be considered separately” (Evertson and Randolph, 1999: 264). With these purposes or goals in mind, the following two areas of action are particularly important for policy-makers and educational planners to consider.

- (i) *Clear policies must be established for classroom organization, both the way in which students are assigned to classrooms and the acceptable organizational configurations or patterns within the classroom.*

Rather than mandate a particular form of classroom organization, these policies should allow informed decisions to be made by administrators and teachers. Thus, the policies should establish the

guidelines within which local decisions should be made. The guidelines should establish the importance of achieving a balance between heterogeneously and homogeneously organized classrooms. That is, classrooms may be homogeneously organized for certain subject-matters (e.g. science and mathematics) and heterogeneously organized for other subject-matters (e.g. history, art). The guidelines should also emphasize the importance of using a variety of organizational forms within classrooms: whole class, small groups, and individual students. Finally, the guidelines should recommend that teachers make use of educational practices that are consistent with the particular form of classroom organization in place at any given time. Reasons for each guideline should be provided, with supporting research cited where appropriate.

- (ii) *In order to help school administrators and teachers to understand and properly implement these policies, a series of in-service training sessions should be designed and implemented.*

In terms of content, these sessions should help teachers acquire knowledge in four areas: (a) starting school; (b) preventive classroom management (including establishing and maintaining rules and routines); (c) employing co-operative learning; and (d) working with small groups (including the development of activities and assignments for the remainder of the students in the classroom). Rating scales can be introduced to help teachers understand the various principles and, more importantly, collect baseline data regarding their current level of performance relative to the principles. After a reasonable period of time, teachers can use the rating scales once again to note improvement relative to the principles. An example of a set of rating scales associated with some of the key principles of effective classroom management is included in *Appendix I*. Descriptions of each rating scale are given in *Appendix J*. Although these rating scales are intended to be used by researchers, administrators or peer evaluators, they can be modified for use by teachers.

In terms of format, videotapes or videodiscs of various approaches to classroom organization and management would be extremely useful (Anderson, 1989). Classroom organization and management are two

aspects of effective teaching that often must be seen in order to be fully appreciated. If videotapes or videodiscs are unavailable, they can be replaced by written teacher narratives that describe and illustrate the major concepts and principles (Behar-Horestein, 1999).

The use of narratives in in-service training has three major benefits. First, teachers already use narratives to share their knowledge with other teachers – that is, they tell stories to one another. Thus, narratives have immediate face validity. Second, narratives are concrete – they pertain to a particular situation, a specific group of students, or a certain problem. As such, they describe how teachers struggle to interpret and apply the relatively abstract concepts and principles that are given by many policy-makers and planners in their own classrooms. Third, narratives enable the reader to begin to understand the relationship between a teacher's intended actions and the actual events that take place in the classroom, as well as the reasons for any discrepancies between them.



## V. The structure of lessons

As mentioned in *Chapter III*, most teaching and learning takes place in classrooms – classrooms that have physical, psychological, and socio-cultural components or aspects. It is in these classrooms that the curriculum is delivered to students. To put it another way, it is in these classrooms that the *intended* (or planned) curriculum becomes the *implemented* (or actual) curriculum (Westbury, 1989).

As mentioned in *Chapter II*, the primary building block of the curriculum is the learning unit. However, the primary unit of delivery of the curriculum is the lesson. The relationships between classrooms, learning units and lessons are shown in *Figure 3*.

*Figure 3* illustrates the embedded nature of life in classrooms. First, lessons are embedded in learning units. In the hypothetical examples shown in *Figure 3*, the first learning unit contains five lessons, while the second contains 12 lessons. Second, the lessons are embedded (that is, delivered) in the classroom context. Climate and culture (*Chapter III*) are indicated on the left side of the figure, whereas organization and management (*Chapter IV*) are indicated on the right side of the figure. The delivery of the lesson, then, is influenced by the learning unit of which it is a part, the physical arrangement of the classroom, the classroom culture and climate, and the way in which the classroom is organized and managed.

### *The lesson*

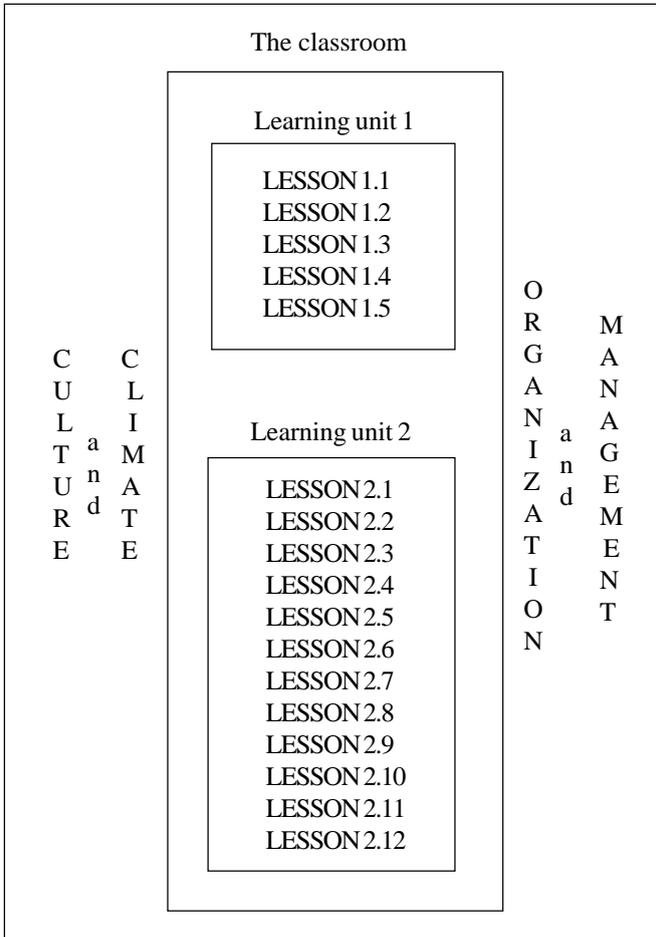
Like the concept of an elephant referred to in *Chapter II*, the concept of a lesson is more easily recognized than defined. Virtually everyone can identify a piano lesson, a reading lesson or a physics lesson. Stigler and Stevenson (1991: 14) used the analogy of a story to describe a lesson:

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“A good story is highly organized; it has a beginning, middle, and end; and it follows a protagonist who meets challenges and resolves problems that arise along the way. Above all, a good story engages the reader’s interest in a series of interconnected events, which are best understood in the context of the events that precede and follow it.”

Just as the sequence of events provides contextual clues for understanding what is happening within a story, each lesson takes its meaning partly from the lessons that preceded it in the learning unit (as well as, in many cases, from the lessons that will follow).

**Figure 3. The embedded nature of classrooms, learning units and lessons**



In addition to the external structure imposed on the lesson by its placement within the learning unit, each lesson has an internal structure. Numerous components of this internal structure have been identified (Gump, 1987; Wragg, 1994). The most frequently mentioned

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components are: (a) the purpose of the lesson; (b) the activities in which students engage during the lesson, as well as the sequence of those activities; (c) the time allocated to the lesson and the pace at which students move through the lesson; (d) the ways in which progress is assessed and evaluated; and (e) the roles and responsibilities of teachers and students (Anderson, 1999).

### *Lesson purpose*

Based on the activities that he observed in a variety of classrooms, Gump (1967) suggested that there were three general lesson purposes: academic (i.e. students are to gain some knowledge or an academic skill by participating in the activity); social (i.e. students are to learn something about their fellow students or teacher, or develop social skills by participating in the activity); and recreational (i.e. students are to have fun and enjoy participating in the activity). The vast majority of an effective teacher's lessons focus on academic purposes.

Because lessons are embedded within learning units, the academic purpose of a lesson is derived from (or must be consistent with) the objectives of the learning unit. Consequently, the Taxonomy Table described in *Chapter II* is a useful framework for classifying and, thus, understanding academic lesson purposes. Other frameworks are available, however; for example Doyle (1983) combined classroom activities with their purposes and arrived at four types of academic tasks: memory, procedural, comprehension or understanding and opinion. Interestingly, and importantly, these correspond quite nicely with the four types of knowledge included in the Taxonomy Table: factual knowledge (memory), conceptual knowledge (comprehension or understanding), procedural knowledge (procedural), and metacognitive knowledge (opinion).

Lessons can also be classified in terms of their expected role in facilitating student learning. Anderson *et al.* (1989), for example, identified four such roles: introducing new content, expanding on new content to the point of mastery, reviewing previously taught content to help students remember it, and reviewing previously taught content for the purpose of correcting errors and misunderstandings.

Regardless of its specific definition, much has been learned about lesson purposes over the past 30 years. First, while lesson purposes are numerous and varied, the vast majority of lessons tend to emphasize memorization rather superficial understanding and the routine use of well-taught skills (McKnight *et al.*, 1987; Purves, 1989). Second, the number of introductory and review lessons (rather than mastery lessons) is quite high in many countries. As McLean (1988: 36) pointed out: “This tendency to touch a topic and move on before the majority of students have mastered it is common in North America, but not in Japan and in other countries where high achievement is observed”.

### *Lesson activities and sequence*

Lesson activities refer to the events of the lesson. Berliner (1983) developed a fairly extensive list of these activities, which includes one-way presentation (e.g. lecture or monologue), two-way presentation (e.g. discussion or dialogue), mediated presentation (e.g. computers, videotapes and slides), seatwork, group work, silent reading, reading circles, construction, games and housekeeping. To this list, Stodolsky (1988), who referred to lesson activities as instructional formats, added recitations (i.e. rapid-fire questions and answers), student reports, tutorials and tests. These categories account for the vast majority of the events that occur in classrooms throughout the world (Anderson *et al.*, 1989).

Lessons typically consist of a sequence of activities, although occasionally one encounters a single-activity lesson (e.g. an entire lesson consisting of a lecture or seatwork). In many Western countries, lessons in basic skills (e.g. reading, writing and mathematics) tend to have a common structure. In Germany, for example, a four-phase lesson structure such as the one presented below, was found to be common in mathematics classrooms (Jablonka, 2003). The four phases are the following: (a) review of previous material, often by checking homework or by means of a brief lecture; (b) presentation of the topic and of the problems of the day; (c) development of a procedure to solve the problem, typically in a whole class activity guided by the teacher; and (d) practice, usually by assigning a set of problems (similar

to those in the previous phase), that are solved by the students as seatwork. If not completed in the time provided, the task can be completed outside the classroom as homework.

In Japan, on the other hand, mathematics lessons tend to take a different form (Shimizu, 2002). This lesson structure includes five phases: (a) review of the previous lesson; (b) presentation of the problems of the day; (c) students work individually or in groups to solve the problems; (d) discussion of solution methods; and (e) highlighting and summarization of the main points (by the teacher).

Although the first two phases are identical in both countries, the lessons differ dramatically during the third phase. In the German system, the teacher shows the students how to solve the problems. In the Japanese system, the students are made to work to try and solve the problem on their own. The various methods thought up by the students are then discussed by the teacher, who then highlights and summarizes the main points. In Germany, the students practice applying the problem-solving procedure that they have been taught at the close of the lesson.

Regardless of the specific type of lesson activity, four aspects of activity tend to be very important for student learning: structure, clarity, involvement and meaning. One of the major findings of international studies is that the type of activity (e.g. one-way presentation versus two-way presentation) bears less significance than the way in which the activity is presented to the students (structure and clarity), how students engage in the activity (involvement), and how the activity and the students' participation are interpreted by the students themselves (meaning). Clarity will be discussed in *Chapter VI*, and involvement in *Chapter VII*. At this point in the discussion, however, a few comments about structure and meaning are called for.

The term 'structure' has two meanings. The first corresponds to the description of a lesson offered by Stigler and Stevenson (1991) summarized earlier in this chapter. The second is based on the assumption that the structure of a lesson should help students understand the structure of the subject-matter being taught (Mortimore *et al.*, 1988; Renkl and Helmke, 1992). Regardless of

the meaning, structure does not mean that teachers must control the lesson. In other words, structure does not equal control. A co-operative learning lesson, for example, may involve structuring by the teacher at the beginning of the lesson (e.g. forming groups, assigning tasks, establishing roles). As the lesson progresses, however, the teacher's role becomes less direct and more unobtrusive.

Meaning implies understanding what is to be learned within the context of what is already known (Weinert and Helmke, 1995) and is clearly related to the second definition of structure: making sense of the structure of the subject-matter. However, meaning is also related to the first definition of structure; namely, the structure of the lesson itself. Stigler and Stevenson (1991) use the term 'coherence' in this regard. Irrelevant comments, frequent shifts from one topic to another, inefficient transitions from one activity to another, and outside interruptions all contribute to a lack of coherence.

#### *Allocated time and pacing*

Time is the feature most frequently associated with the concept of a lesson. Piano lessons last for either 30 minutes or an hour. In secondary schools, a single class period of 50 to 90 minutes is devoted to a single lesson. Occasionally, lessons may transcend class periods, such as when a chemistry experiment continues from Tuesday to Wednesday. None the less, there is a consistent, isomorphic relationship between a fixed period of time and a lesson in the minds of most teachers.

Like structure, pace has two definitions. The first is the rate at which the material in the lesson (or learning unit) is covered. Using this definition, the pace of the lesson is the amount of material (e.g. textbook pages, exercises or problems) covered per unit time. Thus, teachers who expect students to cover a textbook chapter every two weeks are moving at a faster rate than those who expect students to cover a chapter every three weeks. Within reason, more rapid pacing has been linked with greater student achievement (Ornstein, 1999).

The second definition of pacing emphasizes the person or factor responsible for determining the rate at which the lesson progresses

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(Stodolsky, 1988). Using this definition, there are three possible pacers: the teacher, the student(s), or some mechanical or technological means (e.g. videotapes or videodiscs, computer programmes). In most classrooms throughout the world, teachers control the pace of their lessons (Anderson *et al.*, 1989), and, generally, teacher-controlled pacing is associated with higher degrees of student engagement or involvement in learning (Kounin and Sherman, 1979).

### *Assessment and evaluation of lesson progress*

Teachers must determine how well each lesson is going and how well their students are learning, and they may do so in several ways. They may observe students' attention and involvement (Jackson, 1968), they may ask questions (Gall, 1989), or they may set assignments (e.g. worksheets, quizzes) (Pellicer and Anderson, 1995). Following these assessments, teachers make a variety of decisions: Should they go on to the next lesson, or review the previous one? Which students seem to need a little more help, and how can they provide it without disrupting the whole class or slowing down the pace too much? To which students should they assign higher marks, and to whom should they assign lower marks?

Assessment and evaluation are also means of providing feedback to students concerning their learning progress (or lack thereof). The feedback given can range from simple acknowledgement of correctness or incorrectness (knowledge of results), to praise and encouragement, to statements that link a student's performance to his or her effort or ability (attributional feedback).

Regardless of the method used to assess student learning during the lesson, monitoring and record-keeping are critically important (Mortimore *et al.*, 1988). Furthermore, teachers who not only monitor but also make adjustments in their teaching tend to produce higher-achieving students (Anderson *et al.*, 1989).

### *Roles and responsibilities of teachers and students*

While all five components of a lesson are interrelated, this relationship is most evident in the final component. To put it simply,

the appropriate roles and responsibilities of teachers and students depend primarily on the lesson activities. When lecturing, teachers generally assume an active role; students, on the other hand, tend to be rather passive. During lectures, teachers are expected to talk, while students are expected to listen (and perhaps take notes, which is a slightly more active role).

For other activities, however, the roles and responsibilities of teachers and students are not quite so clear. During group work, students are expected to adopt a more active role, while teachers are expected to be more passive. However, some students may be quite passive, while some teachers may be fairly intrusive.

Within the context of the lesson, activities are the vehicle by which students learn. Bennett and Desforges (1988: 222) make this point succinctly:

“The tasks on which students work structure to a large extent what information students select from the environment and how they process it ... To understand the effects of teaching on learning, it is necessary to ascertain the extent to which the intellectual demand of assigned work is [appropriately] matched to children’s [prior] attainments.”

This perspective leads to a critically important teacher responsibility; namely, to assign activities and tasks that correspond to the students’ level of current knowledge and learning. Once assigned, teachers are to facilitate the students’ involvement in the activities and the completion of the tasks so that the desired learning occurs. This implies that the proper role of the teacher is a facilitator of learning rather than a giver of knowledge.

### *Recommendations for teacher effectiveness*

Before any changes in lesson structure are made, the current structure of the lessons should be examined. *Appendix K* contains a check-list that can be used by teachers to report on the activities that they do (or do not) include in their lessons, or by school administrators

or researchers during observation of the lessons. *Appendix L* contains a rubric that likewise can be used by teachers, administrators or researchers. In general, rubrics are preferable to check-lists or rating scales because they provide a more complete description of each lesson component and the degree to which each component is being practiced by the teacher. Modifications in the check-list and the rubric can be made as needed to conform to the lesson structure that is preferable, or lesson structures that are acceptable, in specific countries. Based on what is currently known about lesson structure, the following recommendations can be offered.

- (i) *Teachers and their students should view lessons as parts of larger units of instruction.*

Teachers and students who perceive the lesson as the primary vehicle for learning are quite likely to be guilty of focusing more on the trees than on the forest, so to speak. As mentioned several times, lessons are nothing more or nothing less than vehicles for delivering the carefully thought out and planned learning units. Thus, teachers must continually emphasize the overall structure of the learning unit and each lesson placed within it. Connections between lessons enable students to see learning as part of a unified whole rather than as a series of isolated, discrete pieces.

- (ii) *Teachers should prepare students for learning by providing an initial structure to clarify intended outcomes and cue the desired learning strategies.*

Lessons that begin with advance organizers or previews facilitate student learning by communicating the nature and purpose of the lesson, connecting it to prior knowledge, and cueing the kinds of student responses required for each activity. This helps students to remain goal-oriented and strategic as they process information provided by the teacher, respond to questions or complete tasks included in the lesson. "Good lesson orientations also stimulate students' motivation to learn by communicating enthusiasm for the learning or helping students to appreciate its value or application potential" (Brophy, 2001: 15).

- (iii) *To facilitate meaningful learning and retention, teachers should clearly explain and develop the content, putting emphasis on its structure and connections.*

Networks of connected knowledge structured around powerful ideas are more likely to be understood, remembered and used in new situations than are disconnected bits of information. Thus, teachers must deliver lessons that emphasize the structure of, and connections within, the subject-matter being taught. In such lessons, the teacher: (a) presents new information in terms of what the students already know about the content; (b) proceeds in a sequential manner that is easy to follow; (c) uses pacing, gestures and other oral communication skills to maintain the flow of the lesson; (d) avoids digressions that disrupt the flow of the lesson; (e) elicits students' responses, orally or in writing, to stimulate active learning during the lesson; (f) uses outlines or graphic organizers as necessary to support the structure and flow of the content; and (g) closes the lesson with a summary of the main points, stressing the connections among the key elements of the content (Brophy, 2001).

- (iv) *Students need sufficient opportunities to practice and apply what they are learning and to receive improvement-oriented feedback.*

“Practice is one of the most important, yet least appreciated aspects of learning in classrooms” (Brophy, 2001: 21). Most practices should be embedded in application contexts that feature conceptual understanding and procedural application. In reading, this means practising with extended texts (rather than worksheets). In writing, this means assigning authentic writing tasks (e.g. letters, essays) rather than disembodied writing samples. In mathematics, this means embedding conceptual and procedural knowledge in problem-solving applications.

Feedback is a critical component of successful practice. It should be informative rather than evaluative, helping students assess their progress with respect to the stated objectives. Ultimately, the goal is to facilitate the development of what have been termed ‘self-regulated learning strategies’ (Schunk and Zimmerman, 1998). These

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strategies enable students to monitor their own learning, making adjustments along the way to increase the likelihood that they will be successful in their learning attempts.

- (v) *The teacher should provide whatever assistance students need to enable them to engage in learning activities productively.*

Selecting appropriate learning activities is an important part of the planning process. Regardless of the activities selected, however, teachers must make them come alive for their students. To do this, teachers should: (a) emphasize the connection between the activities and the lesson objective; that is, the objective defines the purpose of the activities; (b) circulate and monitor students' progress, providing assistance as needed; (c) assess students' performance for completion and accuracy; (d) lead the class in post-activity reflection so that students can see for themselves what they have learned from engaging in the activity; and (e) based on assessment and reflection, decide what steps need to be taken next (e.g. additional instruction, different activities).

### *Recommendations for policy-makers and educational planners*

Organizing subject-matter content for teaching students is a very complex task. The subject-matter is first organized into levels (e.g. grade levels, years, terms). For each level, a course of study (typically known as a course) is established. Within each course, the subject-matter is organized into learning units. Finally, within each learning unit the subject-matter is organized into lessons. If done properly, when all is said and done, the lessons lead to attainment of the learning unit objectives, which, in turn, leads to attainment of the course goals.

Within this analysis, it seems clear that it is at the lesson level that teachers can have the greatest effect, be it positive or negative. As described in this chapter, their effect is likely to be maximized when lessons have clear purposes, including activities that are explicitly related to the purposes, that are meaningful to the students and actively

engage them, and that have a structure that is logical, functional and efficient. In this vein, educational planners and policy-makers can help teachers become effective in two ways.

- (i) *Teachers must be helped to see the integral relationship between lessons, learning units and courses, and the influence of each one on the others.*

Documents describing and illustrating the relationships between lessons, learning units and courses should be prepared and distributed. The following two points are among the most important to include in these documents.

First, objectives become increasingly specific as one moves from courses to learning units to lessons. Anderson *et al.* (2001) differentiated among three levels of objectives that are directly related to these three levels of subject-matter organization. They refer to them as global (course), educational (learning unit) and instructional (lesson). Without an understanding of the relationships between lessons, learning units and courses, teachers may fail to see how learning at each lower organizational level facilitates or inhibits learning at each higher organizational level.

Second, in most studies of opportunity to learn (OTL) or curriculum alignment, estimates of OTL or alignment are made at the course level. Unfortunately, teachers do not teach at the course level. They teach at the lesson level, with the use of learning units to link lessons with courses. Understanding the decomposition of courses into learning units and learning units into lessons is necessary to ensure that OTL on paper becomes OTL in the classroom.

- (ii) *Teacher guides should include discussions on lesson structure, best lesson structures, and acceptable or appropriate lesson structures.*

The discussion concerning structure should be organized around the five major components: (a) purpose; (b) lesson activities and sequence; (c) allocated time and pacing; (d) assessment and evaluation of learning progress; and (e) the roles and responsibilities of teachers

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and students. For each component, the best or acceptable practices should be identified, taking into consideration research done, or being done, in the field, as well as cultural considerations and constraints.

If possible, model lessons should be included, using videotapes, videodiscs or narratives (see discussion in previous chapter). Also, check-lists such as the one shown in *Appendix K* and, in particular, rubrics such as the one shown in *Appendix L*, can be used to facilitate discussion and help teachers to understand the varying degrees or gradations of the various lesson components. These gradations can be quantitative, as in the case of the check-list in *Appendix K*, or qualitative, as in the case of the rubric in *Appendix L*.

## VI. Teacher-student communication

If you were to walk past most classrooms in most schools in most countries, you would hear a great deal of talking. Talking, it seems, is the preferred medium of teaching. It is so prevalent in classrooms that, almost 40 years ago, Bellack *et al.* (1966: 1) were able to assert that classroom activities are “carried out in large part by means of verbal interactions between students and teachers”. Despite the technological innovations that have been introduced into education over the past few decades, this assertion remains true today in the vast majority of classrooms throughout the world. In fact, the frequency of teacher-led verbal interactions in classrooms has changed little over the past century (Cuban, 1984).

Teachers use a fairly predictable pattern in their verbal interactions with students. They tell them things, ask questions, allow or encourage students to answer the questions, and react to their answers (or lack of answers). Bellack *et al.* (1966) characterized this pattern of verbal interactions as structure (tell)-solicit (ask)-response (answer)-react (to the answers). Students can also tell teachers things, ask them questions, give them an opportunity to answer the questions, and react to their answers. However, this student-directed pattern occurs far less frequently than the teacher-directed pattern.

In addition to talking to students, teachers also show them what they need to know or are expected to learn. They show pictures (moving or still), graphs, maps, charts and other visual displays. They demonstrate the ways in which they want things done or the procedural knowledge that they want students to learn. When teachers use visual displays, they quite often talk to the students at the same time as they show the displays. Therefore, teachers must either possess or be able to develop good communication skills related to showing and telling if they are to be effective in their classrooms.

### *Structure-solicit-response-react: the teacher's tools*

Although four decades have past since Bellack *et al.* (1966) developed their framework for analyzing the language of the classroom, it remains a useful framework for understanding and, ultimately, improving communication between teachers and students. Because of its relevance, it is important to understand each of the four components.

'*Structuring*' refers to "attempts by teachers and less often by students to supply the content of lessons and to provide both the long-term and the moment-by-moment framework that guide the course that those lessons take" (Doenua, 1987: 398). In other words, during the structuring phase, teachers talk about the structure of the subject-matter (e.g. the major concepts, their interrelationships, and the required knowledge and cognitive processes), as well as the structure of the lessons in which the subject-matter is being presented or taught (e.g. the sequence of activities, directions for completing assignments).

'*Soliciting*' refers to "attempts by teachers and, again, less often by students to elicit a verbal or non-verbal behaviour from a classroom member" (Doenua, 1987: 407). Most often, these attempts are in the form of questions that teachers ask the students. They may also take the form of commands or requests. Far less frequently, physical prodding may be needed.

'*Responding*' refers to "any verbal or non-verbal act designed to fulfil the expectations implicit in the questions, commands, or requests of others" (Power, 1987: 413). Since teachers do most of the soliciting, students do most of the responding. Individual students may answer questions posed by the teacher, whereas entire classes of students may comply to a command to begin working on problems given in the textbook. Teachers do respond to student solicitations, although, once again, this is relatively infrequent in most classrooms. A teacher who provides help to a student who is working on an assignment in or at his/her seat or table *at the student's request* is responding.

'*Reacting*' refers to attempts, typically on the part of the teacher, to "modify (by clarifying, synthesizing, or expanding) and/or to rate

(positively or negatively what has been said previously” (Bellack *et al.*, 1966: 4). A teacher may react to a correct answer given by a student by stating that the answer is partially correct and requires more information (i.e. reacting by modifying), or by praising the student for the partially correct answer (i.e. reacting by rating). A teacher may react to an incorrect answer by giving the student clues as to what the correct answer is, or by redirecting the question to another student. Finally, a teacher may react to a student who is reluctant to respond appropriately to the command “put your books away and take out a paper and pencil” by telling the student to “hurry up”.

Although the analytic framework developed by Bellack and his colleagues is quite useful in examining and understanding the verbal interactions of teachers and students, it must be remembered – as the last example illustrates – that communication is also *non-verbal*. Students may respond physically (by complying or not). Likewise, teachers may react physically (with an encouraging pat on the back on the one hand, or escorting a non-complying student from the classroom to the principal’s office on the other).

### *Dialogue and thoughtful discourse*

In *Chapter III*, the concept of ‘instruction-as-dialogue’ was introduced as a key component of a Powerful Learning Environment. At that time, dialogue was contrasted with monologue and was described as communication with a ‘conversational tone’. In common parlance, dialogue involves teachers *talking with* students rather than *talking at* them. Students are not an audience; rather they are an integral part of the communication process.

In this regard, Brophy (2001: 19) has introduced the concept of ‘thoughtful discourse’. The key to thoughtful discourse lies in the questions that teachers ask in the classroom; more specifically the way in which teachers use those questions to guide instruction and facilitate learning. According to Brophy, thoughtful discourse requires that teachers use questions to “stimulate students to process and reflect on content, recognize relationships among and implications of its key ideas, think critically about it, and use it in problem-solving, decision-making or other higher-order applications”.

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Thoughtful discourse focuses students' attention on a small number of related topics or ideas. Questions are used to invite students to "develop explanations, make predictions, debate alternative approaches to problems, or otherwise consider the content's implications or applications" (Brophy, 2001: 20). Students are expected to justify their assertions, explain or elaborate on their answers, or comment on classmates' comments and answers. When discourse is successful, students begin to respond to one another as well as to the teacher.

## *Demonstrating and modelling*

As mentioned earlier, often in classrooms, showing and telling must go hand-in-hand if teachers are to be effective communicators. This combination is known as 'demonstrating' or 'modelling'. Demonstrating and modelling are particularly important when the emphasis is on helping students develop learning strategies. Strategy teaching, in turn, is particularly important for less-able or lower-achieving students who might not be familiar with particular strategies or who might not employ them because it does not come naturally to them.

One particular form of strategy teaching is referred to as 'cognitive modelling'. Cognitive modelling occurs when teachers talk through the strategy as they demonstrate it in front of their students. Thus, cognitive modelling "makes overt the otherwise covert thought processes that guide use of the strategy in a variety of contexts" (Brophy, 2001: 25-26).

Demonstrating and modelling can be used to merge concerns for content with concerns for strategies for learning the content. When providing feedback to students as they work on assignments, for example, teachers can suggest strategies for finding the answers rather than providing the answers for the students. In this way, the students are focused on both the content being learned and the strategies being used to process the content and solve problems. This approach can be empowering for students (see *Chapter III*).

### *Recommendations for teacher effectiveness*

The recommendations concerning teacher-student communication are presented in three sections: structuring, soliciting and reacting. These recommendations focus on *how* effective teachers communicate with their students. The issues included under the headings of “Dialogue and thoughtful discourse” and “Demonstrating and modelling” pertain primarily to *what* teachers should communicate to students (e.g. conceptual understanding, learning strategies), although issues concerning *how* to communicate with students are certainly relevant to discourse, demonstrations and modelling.

#### *Recommendations concerning structuring*

The first recommendation regarding structuring concerns clarity. Clear communication is needed if students are to understand and benefit from the structure. Understanding is generally enhanced when multiple modes of presentation are used. The second recommendation in this section concerns the merging of showing and telling.

(i) *The presentations made by teachers should be clear and understandable.*

Teachers can use several techniques to improve the clarity of the information they present and the explanations they give to students. Among the most important of these techniques are the following:

1. Providing an overview of the lesson and the subject-matter contained within it, helping students to understand the big picture rather than focusing on the details or minor points.
2. Within reason, being redundant. (Elsewhere, I have referred to this recommendation as ‘reasonable redundancy’ (Anderson, 1999).) Redundancy is particularly important when difficult concepts or complex procedures are being taught.
3. Avoiding digressions and sticking to the topic.
4. When in doubt, checking to see whether the students understand, as well as checking the extent of that understanding. A teacher must not assume that students understand when this may not be the case. Asking questions and giving brief assignments are useful ways of doing this.

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5. Including numerous and varied examples to illustrate major points and help students understand abstract concepts and complex procedures.
6. Using verbal markers (e.g. “This is important”, “Write this down”) to help students learn to differentiate what is important (or more important) from what is not (or not as) important.
7. Using more precise rather than less precise or more ambiguous terms, definitions and descriptions.
8. Using metaphors, similes and analogies to highlight relationships, particularly relationships between new material and what students already know and can do.

*(ii) Showing and telling in combination are likely to be superior to either one in isolation.*

Verbal presentations require students to process the incoming information sequentially; that is, students are expected to follow the sequence of materials presented one piece (or step) at a time. Thus, the teaching of the logic of an argument and cause-effect relationships is often more effective when the presentation is verbal. Visual presentations, on the other hand, allow students to process information simultaneously; that is, students can take in various pieces of information at the same time, and contemplate the ways in which they are related. As a consequence, the teaching of relational concepts pertaining to size, shape and direction, as well as the teaching of procedural knowledge, is usually more effective when the presentation is visual. Combining verbal and visual presentations therefore gives the teacher the best of both worlds.

In addition, many students benefit from presentations which are targeted towards multiple modalities (e.g. seeing as well as hearing). Multiple modalities tend to give students a deeper or more complete understanding of the material being presented. In this regard, physical objects (so-called ‘hands-on’ activities) are quite useful in helping students to grasp the meaning of abstract concepts.

#### *Recommendations concerning soliciting/questioning*

Teachers tend to ask questions for two purposes: to find out whether the students understand what is being presented, and to

stimulate the students' thinking. Questions asked for the purpose of the former are typically referred to as 'lower-order' questions, whereas questions asked for the purpose of the latter are frequently termed 'higher-order' questions. Teachers should understand the two primary purposes of classroom questioning and apply questioning techniques that are appropriate to these two purposes.

When asking lower-order questions, teachers should: (a) ask clear, un-ambiguous questions; (b) ensure that the questions focus the students' attention on the key content and objectives; (c) ask questions that permit them not only to check for student understanding, but also to identify possible reasons for anything that may have been misunderstood; and (d) avoid excessive use of choral responses or call-outs; they should rather direct questions to one student at a time.

When asking higher-order questions, teachers should: (a) allow sufficient time after they ask the question to allow the students to think about and formulate their answer; and (b) remind the students as necessary that an answer is expected (that is, it is not a rhetorical question).

Whenever possible, the teacher should strive to find a balance between lower-order and higher-order questions in their classrooms (although not necessarily during each lesson).

#### *Recommendations concerning reacting*

Three recommendations can be offered concerning reacting to students' responses, be they oral or written. These recommendations concern the use of feedback, praise or reinforcement, and responses following an incorrect, incomplete, or no response.

*(iii) Teachers should provide immediate feedback to students concerning the correctness or adequacy of their responses.*

Students should know whether they have responded correctly or incorrectly, adequately or inadequately, appropriately or inappropriately. This feedback should be clear, prompt and accurate.

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In cases where the initial feedback is negative (that is, the response is incorrect, inadequate or inappropriate), corrective feedback should be provided. 'Corrective feedback' gives students insight into, and directions on, how to correct the identified problem. Proper corrective feedback makes it less likely that errors and misunderstandings will accumulate and interfere with student learning in the future.

(iv) *Teachers should praise students to reinforce correct, adequate and appropriate responses.*

However, this should be done in moderation. Furthermore, students should be told why they are being praised (i.e. what they did or accomplished in order to receive praise). Unmerited or random praise should be avoided. Whenever possible and appropriate, thought and effort, as well as answers and products, should receive praise.

(v) *When incorrect, incomplete or no responses are given by the students, the teacher should react in one of several potentially useful ways.*

Although there is no one best way for teachers to react to such responses, they can opt for one among many potentially useful responses. These include: (a) staying with the student, probing his or her understanding and helping him or her to formulate a more accurate answer; (b) giving clues to the student to help him or her to formulate or provide a more appropriate or correct answer; (c) redirecting the question to another student in the class; or, if all else fails, (d) providing themselves the correct or appropriate response.

The reaction of the teacher depends, to a large extent, on his or her familiarity with the individual student and the entire class. If either probing or prompting is used, teachers should take care to ensure that these reactions and the students' responses or non-responses to them do not interfere with the flow of the lesson.

## *Recommendations for policy-makers and educational planners*

In many ways, clear and precise communication lies at the very heart of teacher effectiveness. Effective communication requires that

teachers possess a thorough knowledge of both their subject-matter and their students. Good communication helps to build a bridge between the two, enabling teachers to make the subject-matter understandable to their students. This is the true meaning of Shulman's (1987) 'pedagogical content knowledge'.

Poor communication can make learning even the most simple and straightforward subject-matter far more difficult. Poor communication is the most likely cause of the students' lament: "He/she really knows the stuff, but just can't get it across".

It is important to remember that the wider the educational gap between teachers and students, the more likely it is that poor communication will be a problem. Thus, Farrell's (1989: 66) comment on the level of education needed by primary school teachers should not be surprising:

"It is important for teachers to have achieved a level of formal schooling at least just above that of the students they are teaching. That is, primary teachers should themselves have junior secondary; junior secondary should have a university degree. However, providing or requiring more formal education than these minima can be a very bad investment. Some poor nations provide university education for primary teachers. The payoff for this additional formal education appears to be minimal or nil."

Educational planners and administrators can have a positive impact on the quality of communication between teachers and students in at least two areas: teacher selection and teacher evaluation.

- (i) *Communication skills should be one of the primary criteria for selecting teachers.*

Measures of oral and written communication should be incorporated into the teacher selection process. Short essays on relevant educational matters can be used to gather information regarding competence in written communication, as well as knowledge and beliefs concerning those matters (e.g. fostering parental support and involvement, assigning grades to students). Well-structured interviews

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can be used in a similar manner, with emphasis on oral communication competence. When possible, asking prospective teachers to demonstrate how they would teach an important concept or procedure would provide additional insight into the teachers' competence in communicating.

- (ii) *Assessment of communication skills should be a regular part of ongoing teacher evaluation.*

Administrators, supervisors and inspectors should regularly check on the quality of teachers' communication. The criteria used to monitor the quality of communication should be consistent with what is known from research on clear and useful classroom communication. Instruments such as the one shown in *Appendix M* can be used in this regard. Once completed, the instrument can be shared with the teacher as a means of providing feedback so that improvements in identified areas can be made.

When considering assessment of communication skills, however, it is wise to remember that clarity, like beauty, lies in the mind of the beholder. In the case of teaching and learning, the "beholder" is the student. Therefore, when possible, the students' perspective on the clarity and usefulness of the teachers' communication should be considered. Instruments such as the one shown in *Appendix N* can be used in this regard. Such instruments should be completed anonymously to increase the likelihood that students will give honest and truthful responses. The teacher can scan the completed instruments looking for response patterns, or a third person can summarize the responses of the entire class. If summaries are made, they should include both the mean response as well as the variability in the students' responses.

## VII. Student learning

Students hold the key to their own learning. By deciding what students should learn, developing appropriate learning units, establishing functional classroom cultures, effectively organizing and managing classrooms, planning and delivering focused, structured and engaging lessons, and communicating as clearly as possible with their students, teachers are creating what Gagné (1972) referred to as the ‘conditions of learning’. That is, the best thing that teachers can do in their classrooms is to create conditions that will maximize student learning.

Glancing back over the previous chapters, the reader should notice a distinct student-orientation in virtually all of them. Learning units (*Chapter II*) are to be designed as bridges linking students (as they currently are) with the intended learning outcomes (where it is believed students ought to be). Classroom climate and culture (*Chapter IV*) are not objective realities; rather they exist in the minds of the students who occupy the classrooms. Teachers must ask themselves at least two questions when selecting activities to include in lessons (*Chapter V*). First, what kinds of activities are likely to lead students to master the objectives? Second, what kinds of activities are more likely to appeal to these students and engage them in the process of learning? Both of these questions include clear and explicit concerns for students. Finally, rather than assuming that they are being clear in their communication, teachers would be wise to check whether this is in fact the case, and whether students are indeed understanding the intended message (*Chapter VI*). In order to be effective, then, teachers must learn to see the classroom, and the events and activities that take place within the classroom, through the eyes (and ears) of their students.

While they are in classrooms, students spend most of their time listening and working.<sup>1</sup> More specifically, they listen when their teachers talk and they work on assignments set by their teachers. From the students' perspective, then, each lesson is a sequence of 'listen segments' and 'work segments'. For example, in a lesson in a German school, as described in *Chapter V*, the sequence of the lesson would be listen-listen-listen-listen-work-work. In contrast, the lesson structure in a Japanese school, which is also described in the same chapter, would be listen-listen-work-listen-listen. Most lessons, in fact, contain both segments of listening and working, although at the earlier grade levels, work may be replaced – or at least supplemented – by play (which is, in many respects, young children's work), and at the upper-grade levels, the entire lesson may consist of listen segments, with work expected to be done outside the classroom (e.g. homework).

If students are to be successful learners, then, they must be mentally or actively involved during both the listen and the work segments respectively. However, the nature of the involvement required in these two segments is quite different.

### *Student involvement during listen segments*

The importance of attention in learning has been examined by generations of scholars (Anderson, 1984). In the 1920s, Morrison (1926: 82) asserted that "perhaps the commonest cause of non-learning is poor attention". Historically, two types or forms of attention have been identified: selective attention and sustained attention.

*Selective attention* is said to occur when the student focuses on certain features of the learning situation at the expense of others. For example, when listening to a teacher, a student can attend to the examples being presented or to the concept that the teacher is trying

1. Students also talk in classrooms during both the listen and the work segments. Talking during a listen segment is typically restricted to responding to the teacher's questions. Talking during a work segment most often occurs when students are working in groups or asking the teacher for assistance. Overall, however, the proportion of student talk is small relative to the proportion of teacher talk and silent work.

to help the students to understand by using the examples. In simple terms, the student is likely to learn what he or she attends to (e.g. remembering the examples versus understanding the underlying concept). In contrast to selective attention, *sustained attention* requires that the students concentrate on and remain involved in the presentation being made for a sufficient length of time – sufficient to learn the procedural knowledge being taught, or to follow the logic of the teacher’s argument relative to a particular point of view.

During listening segments of lessons, then, teachers have two primary goals: they want to focus the students’ attention on the more important things (and not on the less important things), and they want to maintain the students’ attention for extended periods of time. From the students’ perspective, then, many of the recommendations made in *Chapters V and VI* can be re-examined.

Providing an overview of the lesson using outlines or graphic organizers and verbal markers, asking questions that focus students’ attention on the key content and objectives, finishing with a summary of the main points, and providing highly specific feedback are all intended to focus students’ attention on the main content material. In contrast, proceeding in an easy-to-follow sequential manner, maintaining the flow of the lesson, eliciting students’ responses to stimulate active learning, and directing questions to individual students (rather than allowing call-outs) are all intended to sustain students’ attention. Within this framework, the purpose of ‘reasonable redundancy’ is to give second and third chances to those students who were unable or unwilling to sustain their attention for a sufficient length of time. Similarly, the importance of variety in lesson structure in general, and in activities in particular, can be explained in terms of the limits of sustained attention; that is, students do not have a limitless concentration span.

In combination, selective attention and sustained attention help to define ‘time-on-task’. More specifically, selective attention defines the actual task in which the student is involved or engaged. Sustained attention, on the other hand, defines the ‘time-on’ portion of the concept; that is, when the student spends a sufficient amount of time

on that particular concept. It is important to note that ‘time-on-task’ is one of a handful of variables (or factors) that have been found to be consistently related to effective teaching and student achievement (Scheerens and Bosker, 1997; Hill and Crévola, 1997).<sup>2</sup>

### *Student involvement during work segments*

In most classrooms, students are routinely given work that they are expected to complete. This work may consist of reading stories or chapters of a book, writing essays or reports, solving mathematical exercises or problems, carrying out scientific experiments, and so on. As these tasks are assigned to the students, they are often called ‘assigned work’, or simply ‘assignments’ (Anderson, 1987). Since students are expected to learn by completing the work, Doyle (1983) has referred to it as ‘academic work’.

Academic work can be completed either in school or at home. It is only logical that the work completed at home be termed ‘homework’. Homework is one of the few variables in international research that has been consistently associated with increases in student achievement (Anderson and Postlethwaite, 1989; Creemers, 1999).

Some educators have argued that the academic work assigned to students defines the curriculum for them (Zumwalt, 1989). That is, inherent in most well-planned and well-organized assignments are rather explicit clues as to the objectives (e.g. “Solve these word problems”), the content (e.g. linear equations), the methods used to complete the work (e.g. “Work in pairs and raise your hand if you need assistance”), and the nature of acceptable answers (e.g. “Show your work and be accurate to the first decimal point”). If students can glean such potentially useful information from their assigned work,

2. Scheerens and Bosker (1997) identified five such variables. In addition to time-on-task, these variables are: the closeness of the content covered to the assessment instrument; a structured approach to teaching; specific objectives, frequent assessment and corrective feedback; and types of adaptive instruction that can be managed by teachers. Hill and Crévola (1997) identified three variables: engaged learning time (or time-on-task); high expectations of student achievement; and focused teaching that maximizes learning within each student’s zone of proximal development.

educators and researchers can do likewise. In this regard, Anderson (1987) prepared a set of questions that can be raised as educators and researchers review students' assignments. A check-list derived from these questions is displayed in *Appendix O*.

Inherent in this check-list is a series of issues to which teachers should attend as they prepare assignments for their students. While most of these issues are common sense, they unfortunately are not commonplace. As a consequence, they bear repeating. The purpose of assignments in terms of intended student learning should be made clear to the students, and the completion of the assignment should lead the students to or towards accomplishment of that goal (check-list items 1, 2 and 3). Students should be made aware of what they need to do to complete the work and the way in which their work is to be evaluated (check-list items 4 and 5). Finally, the amount of work assigned to students should be appropriate in light of its purpose, the amount of time allocated to the work, and the credit that they will earn for successfully completing it (check-list item 6). Finally, although the assignment is of a type or form with which the students are familiar, additional explanation concerning completion of the assignment may be needed (check-list item 7).

When properly implemented, the items on the check-list should ensure proper *selective attention* on the part of the students. What can teachers do to ensure that the students *sustain their attention* for a sufficient length of time? Once again, several of the recommendations offered in *Chapter V* provide answers to this question. For example, the teacher should circulate and monitor the students' progress, providing assistance as needed. He or she should evaluate student performance in terms of both completion and accuracy (thus stopping periodically to check how well the students are actually doing, rather than merely focusing on their on-task behaviour). When common errors are identified, the teacher should move from the work segment to a listen segment so that all students can benefit from the teacher's explanation. The alternative is that the teacher continues to monitor and assist student-by-student, which is a very inefficient way of dealing with the problem.

### *Recommendations for teacher effectiveness*

Based on what is currently known about teacher effectiveness in terms of involving or engaging students in the process of learning, several recommendations can be offered to those interested in improving teacher effectiveness.

- (i) *During presentations, teachers should use techniques that keep the students attentive and involved.*

Interspersing questions into teacher presentations is a useful way of keeping students attentive and involved. Teachers can question the students about a previous response made by another student. In this way, the students know that they must be aware of what is being discussed in class and be prepared to participate in the class discussion at any time. Similarly, stopping and giving the students a problem to solve (“Now do this one”) keeps them on their toes. The information gleaned from the students’ attempts to solve the problem has the additional benefit of providing feedback to the teacher so that the presentation can be modified as needed.

- (ii) *Teachers should select assignments based not only on the relevance of the work to the lesson and unit objectives, but also on the appropriateness of the work of the students.*

Work assigned to students should reflect some intricate balance between the teachers’ objectives and what the students already know and can do. The first priority in assigning academic work should be the objectives being pursued. Nevertheless, effective teachers ensure that the work is neither too difficult nor too easy for the students. If an error of judgement is made regarding the difficulty level of the work assigned, it should be that the work is too difficult rather than too simple: A greater (not lesser) element of challenge is predictive of greater time-on-task and higher levels of achievement. Having said that, teachers should always anticipate the consequences should an error of this kind be made, and be willing and able to provide for the needs of students who initially may have difficulty meeting the demands.

- (iii) *When setting assignments, teachers should also set standards for success and let the students know that they are all expected to meet them.*

This recommendation combines two very important matters: the establishment of meaningful (that is, important and challenging, yet attainable) standards, and making it understood that all students are expected to achieve these standards. In fact, this recommendation may be more important in terms of what it suggests avoiding; namely arbitrary and capricious standards. Standards that are impossible for students to attain should also be avoided, as should standards that students can attain without any effort. Finally, differential expectations for different students or sub-groups of students should be avoided.

- (iv) *Students should be held accountable for both the completion and the quality of their work. In turn, teachers should ensure that the students have learned reasonably well what they are expected to learn before they are allowed to work on their own.*

The importance of student accountability for both their classroom work (Kounin, 1970) and their homework (Walberg, 1984) has been well documented. At the same time, however, it is difficult to hold students accountable for the quality of their work if the quality of the teaching is poor. As a consequence, ‘guided practice’ activities, in which teachers work with students to ensure that they successfully complete assignments, have been advocated by both educators and researchers (Rosenshine and Stevens, 1986).

- (v) *Teachers should use the knowledge they draw from the performance of their students not only to evaluate them, but also to provide them with additional instruction aimed at rectifying their errors and clarifying any misunderstandings.*

There is a tendency on the part of some teachers to assign work to students for the sole purpose of evaluating their learning. Teachers should remember that the quality of the students’ work can also provide them with insights concerning problems and deficiencies

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in the students' learning. When these problems and deficiencies are identified, additional instruction can be arranged or provided to help students to overcome them rather than simply allowing them to accumulate and interfere with future learning.

*(vi) During seatwork (and group work), teachers should circulate among the students and monitor their work.*

This recommendation serves two purposes. First, the physical proximity of teachers to the students increases the latter's attentiveness to the task at hand. Second, and more importantly, by circulating and monitoring their students' work, teachers can identify problems and provide assistance when it is needed.

*(vii) Teachers should recompense students for paying attention and putting in the effort needed to learn, and to learn well.*

Often students are neither encouraged to pay attention and put in the effort to learn, nor are they rewarded for doing so. Simple praise for behaving appropriately does wonders in many situations and for many students. Other recompenses, such as tokens that can be exchanged for a variety of goods and services, or extra time to do what students want to do (within reason), can be used as necessary.

*(viii) Teachers should regularly monitor student involvement in learning.*

Some teachers are more able to 'read' their students than others. They seem to know almost intuitively when students understand the lesson and when they are lost. They use these 'readings' to make adjustments in their teaching or to provide extra time and assistance to particular students. Other teachers seem to be so self-conscious about their teaching that they are unaware of their students. For these teachers, some form of external help may be needed to monitor student involvement in learning. One source of help is the students themselves. A short questionnaire such as the one shown in *Appendix P* can be used to collect information regarding student involvement. Other sources of help include other teachers, supervisors or administrators. A structured observation instrument such as the

one shown in *Appendix Q* can be used by these individuals to gather data on student involvement. These data can then be summarized quite easily and presented to, and discussed with, the teacher.

### *Recommendations for policy-makers and educational planners*

Much evidence suggests that students must be involved or engaged in learning if they are to learn, and learn well. Pre-service teacher education programmes should be based on a student-oriented philosophical framework. As issues concerning these programmes are discussed, the central question should be: What are the consequences for the students?

In-service teacher education programmes should emphasize the role of the students in their own learning. The eight recommendations offered in the previous section under the sub-heading 'Recommendations for teacher effectiveness' should be included in these programmes. With a student emphasis, there is no right way to teach. Rather, the emphasis in teacher education programmes – both pre-service and in-service – should be on helping teachers to develop a repertoire of teaching skills and strategies that can be used in different situations and with different students. Current emphases on correct teaching skills and strategies, if they exist, should be abandoned.

Teacher guides associated with textbooks and other instructional materials should also reflect a student orientation. These guides should include carefully prepared assignments that provide the basis for meaningful and appropriate student work. They should also include suggestions concerning selective and sustained attention; that is, how to get students to focus on the important things and to put forth sufficient effort to learn them.

The consistency with which pre-service teacher education, in-service teacher education and teacher guides address students' concerns and students' roles will go a long way towards increasing teacher effectiveness. Obviously, a strong link between departments of teacher education, curriculum development centres, and national and state education agencies would be beneficial in this regard.



## VIII. How to increase teacher effectiveness

As can be seen in the previous chapters, much is known about teacher effectiveness. The problem addressed in this chapter is how to increase teacher effectiveness; that is, how to get teachers to use this knowledge in order to become more effective in their classrooms. There is little, if any, evidence that enticing teachers, for example by giving them more motivating salaries (Farrell, 1989) or coercing them by, for example, making them conform to administrative mandates (Cohn and Rossmiller, 1987) results in any meaningful, long-lasting improvement in their effectiveness, at least in normal circumstances where teachers are actually paid and where they earn a salary that allows them to live. If teachers are to change the way they teach and, perhaps more importantly, the way they think about their teaching, their reluctance to change must be overcome and support must be provided in their attempts to improve.

### *Overcoming teachers' reluctance to change*

Teachers are reluctant to change for a number of reasons, most of which are quite understandable. Three of the primary reasons are: (a) a lack of awareness that change is needed; (b) a lack of knowledge, particularly procedural knowledge, concerning how to change; and (c) the belief that the changes will not make any difference to them or their students.

#### *Lack of awareness*

Some teachers see no need to change. They believe that they are doing well, or at least the best that they can. They see few, if any, areas in which improvements in their teaching are necessary. Such teachers, as might be expected, are not likely to change.

As a consequence, several attempts to increase teacher effectiveness have begun by simply making teachers aware of what

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they currently do in their classrooms. One model of teacher improvement begins by conducting formal observations of the teacher in his or her classroom. Next, the results of these observations are summarized and discussed with the teacher. During this discussion, the observations made in the teacher's classroom are compared with those made in other teachers' classrooms, particularly those of teachers who are consistently more effective in their teaching. These discussions and comparisons are intended to help the teacher to see in which areas he or she is strong and in which areas improvement may be needed. The teacher, typically in conjunction with a supervisor or administrator, then develops an improvement plan which he or she implements during the next few weeks, perhaps months. Additional observations and discussions take place until the teacher (and perhaps the supervisor or administrator) is satisfied with his or her improvement (Fullan, 2001).

In certain cases, simple awareness of the need to change is sufficient for substantial changes in teaching to occur. Nitsaisook and Anderson (1989), for example, report on a study conducted in Thailand, in which 50 elementary school mathematics teachers participated in a six-day in-service programme. During the programme, the teachers were made aware of the value of several classroom activities. Two of these activities were engaging students in mental computation, and assigning homework. Simply creating awareness of these two activities changed the teachers' classroom behaviour. It must be emphasized, however, that neither of these activities required learning complex and difficult conceptual and procedural knowledge. Rather, teachers already knew how to perform these activities, they simply did not do so.

#### *Lack of knowledge*

Quite obviously, there are numerous occasions on which mere awareness of the need for change is insufficient for change to occur. Many improvements in teaching require that teachers possess substantial amounts of knowledge. Increasing the clarity of presentations of difficult or complex scientific concepts, for example, requires a great deal of both conceptual and procedural knowledge.

That is, teachers need to be familiar with the scientific concepts (conceptual knowledge) as well as know how best to transmit that knowledge to the students (procedural knowledge). For most teachers, the primary sources of their knowledge relative to teaching are: (a) teacher preparation programmes (i.e. pre-service education and training); (b) the various teacher guides and/or manuals that accompany instructional materials such as textbooks; and (c) any courses, seminars or workshops in which they participate on the job (i.e. in-service education and training).

Few formal studies on the efficacy of various types or forms of pre-service education and training have been conducted. Instead, the majority of research in this area has focused on teacher guides or manuals and in-service education or training. With respect to teacher guides or manuals, Farrell (1989: 63) has suggested that a “well-designed teachers’ manual accompanying a textbook set is a very effective form of in-service training for poorly trained teachers”.

With respect to in-service education and training, teachers are more likely to change their teaching when:

1. The knowledge included is based on needs identified by the teachers themselves (Shaeffer, 1986; Clair and Adger, 1999).
2. The knowledge being taught is linked with what the teachers already know and can do (Clair and Adger, 1999; Fullan, 2001).
3. A variety of activities and experiences (e.g. case studies, demonstrations, video recordings of teachers in classrooms, book clubs and discussion groups) is provided for the teachers (Avalos and Haddad, 1981; Garet *et al.*, 2001).
4. The teachers are participating in, and learning from, planned, structured activities (e.g. micro-teaching, role playing, simulations) rather than listening to experts telling them what they ought to know and do (Avalos and Haddad, 1981; Shaeffer, 1986; Garet *et al.*, 2001).
5. The teachers are encouraged to apply what they have learned from their in-service experiences in their own classrooms. Actually, teachers should be encouraged to try, evaluate, modify, and try again (Fullan, 2001).

6. The teachers have opportunities to work together as they learn. Garet *et al.* (2001) refer to this as 'collective participation'.

*The belief that change will make no difference*

Some teachers believe that they make little, if any, difference to the lives of their students. No matter what these teachers say or do, they feel they are unable to get the material across to their students. Large numbers of students consistently fail to learn, and the teachers attribute this failure to factors outside of their control; primarily to characteristics of the students or their home backgrounds. Such teachers are likely to resist change because they consider it futile to make any changes.

These teachers cannot be *told* that they do or can make a difference in their students' lives. Rather they must be *shown* that they do or can. Specifically, they need to see the relationship between what they know and do and what their students learn. It is only when they make this connection between teaching and learning that they are likely to change their beliefs and adopt practices consistent with their desired changes in teaching. Guskey (1986: 9) has made this same point by stating it in the negative: "In the absence of evidence of positive changes in students' learning ... significant change in the beliefs and attitudes of teachers is very unlikely."

The problem, then, becomes how to get these teachers to initiate change in the first place. Several techniques have been used with varying degrees of success. The following strategy, which is a compilation of these techniques, seems worthy of consideration. First, the teacher would be asked to postpone judgement on the value of the suggested changes, to avoid rejecting them out of hand, and to keep an open mind and wait until the evidence has been collected before making a decision concerning their value and usefulness. Second, the teacher would be encouraged to participate voluntarily, rather than be forced to participate, in the planned in-service activities. If the teacher chooses to participate, additional attention should be paid to him or her and extra help offered as necessary. This is consistent with the measures that should be taken with all reluctant learners. If the teacher chooses not to participate, he or she should be asked to

follow the progress and reactions of one or more of his or her colleagues who are participating. In this way, the teacher may be influenced by the experiences and successes of his or her peers.

Of the three primary reasons for resisting change listed above, the teacher's unbelief that he or she is capable of making a difference in the lives of his or her students is likely to be the most difficult to overcome. This unbelief might again be rooted in other complexes the teacher may have about himself or herself; for example a lack confidence in his or her own teaching ability. Such a teacher is, in fact, saying: "Other teachers can make a difference, but I cannot". Once again, showing, rather than telling, is the key to overcoming this resistance and moving these teachers forward.

### *Support for improvement efforts*

There is ample evidence that few teachers can engage in serious attempts to improve their teaching without the support of others (Guskey, 1986; Garet *et al.*, 2001). Virtually all teachers who attempt to change experience some problems and set-backs early on (Huberman and Miles, 1984). Without support, these teachers are likely to give up and return to the status quo. Virtually all meaningful change requires time (Garet *et al.*, 2001; Fullan, 2001). If changes are expected in less than the time required, efforts to change are likely to be abandoned and disappointment will reign supreme. If improvement efforts are to be successful, then, administrators, supervisors and fellow teachers need to provide several types of support.

#### *Providing opportunities to benefit from mistakes*

As mentioned above, teachers attempting to make changes in their teaching practices will inevitably make mistakes. If they are reprimanded for their mistakes, they will possibly reject future changes that require them to do something new and different. Instead, they are likely to cling to their current practices with renewed fervour. Teachers have to learn that it is alright to make mistakes, provided they learn or otherwise benefit from them. A mistake simply means that the desired solution to a problem has not yet been found. And, as

### *Increasing teacher effectiveness*

Fullan (2001) pointed out, the ability to learn by reflecting on past actions, and using insights gained from that reflection to solve problems, is an important characteristic of a teacher striving to become more effective.

#### *Providing opportunities to learn from others*

In most schools throughout the world, teaching is a solitary job. Teachers spend most of their time isolated in classrooms with their students. Contact with other adults is minimal. If administrators are present in the classroom, it is most likely to be for the purpose of evaluating the quality of the teaching provided by the teacher, not of helping the teachers to improve their teaching (McLaughlin *et al.*, 1986).

Improvement in teaching requires that teachers be given opportunities to learn from others. As Fullan (2001) pointed out, it is when teachers actually try to implement a new approach to teaching that they have the most specific concerns and doubts: They need someone to turn to during this time. In this regard, Guskey (1986: 10) suggested that teachers who have participated in in-service activities should be provided continued support and follow-up. As examples of continued support and follow-up, Guskey offered the following examples: ongoing guidance and direction; personal, hands-on, in-classroom assistance; and opportunities to interact and share ideas with their colleagues. To receive this type of support, teachers must be able to share not only their successes, but their failures as well.

#### *Treating teachers as individuals*

Teachers are repeatedly told to treat their students as individuals. However, all teachers are typically given this advice at exactly the same time and in exactly the same way. That is, there is a tendency to consistently fail to recognize differences among teachers, even as they are admonished to adjust their teaching according to existing differences among their students. Suffice it to say that the support given to an individual teacher must be appropriate to that teacher's need for support. Hopkins (1990), for example, suggested that a confident, risk-taking teacher may benefit from a stimulating, demanding school

environment, an environment that in fact provides a minimum of psychological or emotional support. For a far less confident teacher, on the other hand, this same environment may cause great anxiety and a resistance to any attempts to change. Such a teacher requires a very different school environment in which to operate if he or she is to become increasingly effective.

*Recommendations for policy-makers  
and educational planners*

There is a paradox inherent in any attempt to increase teacher effectiveness. On the one hand, there is now a greater knowledge base for improving teaching than ever before. On the other hand, there is a continuous struggle to find ways of helping teachers become aware of, understand and apply this knowledge in their classrooms. To state this point somewhat differently, far more is known about teacher effectiveness than is known about increasing teacher effectiveness.

*Pre-service and in-service teacher education*

To change the status quo is not an easy matter and needs a concerted effort on the part of those responsible for teaching education broadly defined. Operating the pre-service programme within a framework based on what is best for the students (not for the teachers) – i.e. meeting the needs of the students (not those of the teachers) – would be a useful first step. Helping prospective and practising teachers to see things through the eyes of their students as they design their learning units, establish their classrooms, deliver their lessons and communicate with their students will increase the likelihood that they will become increasingly effective in their classrooms.

Teacher education, however, must go well beyond the pre-service programme if teacher effectiveness is to continue to improve. Pre-service programmes, no matter how good they are, can only produce very good novice teachers. Progressing from novice to expert (Benner, 1984) requires a great deal of on-the-job learning by means of in-service education and training. The extensive knowledge base

### *Increasing teacher effectiveness*

pertaining to effective in-service education and training (Guskey, 1986; Clair and Adger, 1999; Garet *et al.*, 2001) should be used to design in-service programmes that benefit all classroom teachers.

#### *Building school cultures*

Within schools, the fundamental problem is building a school culture that emphasizes excellence and which is conducive to meaningful change. As Fullan (2001) suggested, the focus in school reforms needs to move away from structural change towards changing the schools and their culture. This shift of focus requires putting greater emphasis on relationships and values.

The key player in building such a culture is the principal. Leadership for change requires a bias for action, a sense of urgency and a combination of pressure and support (Fullan, 2001). Leadership for change means involving all teachers in the change process, individual by individual, until a 'critical mass' is achieved. This involvement on the part of teachers leads to understanding and commitment. Understanding provides the basis for the change, whereas commitment provides the urgency for the change.

Finally, vision, a strong curriculum, adequate instructional resources, sound professional development, partnerships and collaboration are not sufficient for meaningful change to occur. What is needed in addition is a clear underlying conception of the change process. How is the change going to take place? Who is responsible for what aspects? What happens when a problem is encountered? How will anybody know that the change has taken place? Answers to questions such as these help those involved to understand the change process.

#### *The role of the inspectorate*

Countries that employ school inspectors can use the recommendations contained in this booklet to develop observation instruments based on what is known about effective teaching. The instrument designed by the Dutch Inspectorate, whose indicators are shown in *Appendix R*, is one such example (Scheerens, 2003). What

is interesting, and indeed important, about the instrument is that it is consistent with the recommendations contained in several chapters (e.g. school climate, teacher-student communication, and student involvement in learning). Because teacher effectiveness is a complex concept, the instruments used to assess teacher effectiveness need to be quite comprehensive, but must not be cumbersome.

### *The role of inquiry*

The key to ongoing improvement, in contrast to satisfaction with the status quo, is inquiry; i.e. persistent questioning about how things are going and what could be done differently and better. As Pascale (1990: 14) stated: "Inquiry is the engine of vitality and self-renewal". In discussing teacher-student communication (*Chapter VI*), it was suggested that the use of questions fundamentally changes the nature of the communication that occurs in the classroom. Through proper use of questions, didactic teaching becomes dialogue. Pedantic teaching becomes thoughtful discourse.

Inquiry has the same effect when applied to effective teaching. Asking questions about effective teaching is more useful than making pronouncements about it. Continuing to inquire about teacher effectiveness, whether as an individual teacher or an agency or ministry, is likely to promote the kind of research that is needed to help us better understand the making of an effective teacher.

### *Conclusion*

There are many interlinking units within ministries of education or state agencies that are involved in the improvement of children's cognitive, affective and social development. All of these should be concerned and can be involved in increasing teacher effectiveness. Above all, however, it is on those units responsible for curriculum development and teacher training that the major onus falls.



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## Appendices



## *Appendix A*    The knowledge dimension of the Taxonomy Table

### *A. Factual knowledge*

- Aa. Knowledge of terminology (e.g. technical vocabulary, musical symbols).
- Ab. Knowledge of specific details and elements (e.g. major natural resources, events leading up to a major historical event).

### *B. Conceptual knowledge*

- Ba. Knowledge of classifications and categories (e.g. periods of geological time, literary elements and poetic devices).
- Bb. Knowledge of principles and generalizations (e.g. Pythagorean theorem, law of conservation of matter).
- Bc. Knowledge of theories, models and structures (e.g. theory of evolution, structure of a political system).

### *C. Procedural knowledge*

- Ca. Knowledge of subject-specific skills and algorithms (e.g. skills in painting with water colours, whole-number division algorithm).
- Cb. Knowledge of subject-specific techniques and methods (e.g. interviewing techniques, scientific method).
- Cc. Knowledge of criteria for determining when to use appropriate procedures (e.g. when to apply a procedure involving Newton's second law, when to write particular types of letters).

### *D. Metacognitive knowledge*

- Da. Strategic knowledge (e.g. knowledge of outlining as a means of capturing the structure of a chapter in a textbook).

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- Db. Task knowledge (e.g. knowledge of the types of tests which particular teachers administer).
- Dc. Self-knowledge (e.g. knowledge that criticizing essays is a personal strength, whereas writing essays is a personal weakness).

## *Appendix B* Cognitive process dimension of the Taxonomy Table

1. Remember – Retrieve relevant knowledge from long-term memory:
  - 1.1 Recognize (also Identify);
  - 1.2 Recall (also Retrieve).
2. Understand – Construct meaning from instructional messages, including oral, written and graphic communication:
  - 2.1 Interpret (also Paraphrase, Translate);
  - 2.2 Exemplify (also Illustrate);
  - 2.3 Classify (also Categorize);
  - 2.4 Summarize (also Abstract, Generalize);
  - 2.5 Infer (also Conclude, Extrapolate, Predict);
  - 2.6 Compare (also Contrast, Map, Match);
  - 2.7 Explain (also Construct causal models).
3. Apply – Carry out or use a procedure in a given situation:
  - 3.1 Execute (also Carry out);
  - 3.2 Implement (also Use).
4. Analyse – Break up material into its constituent parts and determine how the different parts relate to one another and to an overall structure or purpose:
  - 4.1 Differentiate (also Discriminate, Distinguish);
  - 4.2 Organize (also Integrate, Outline);
  - 4.3 Attribute (also Deconstruct).
5. Evaluate – Make judgements based on criteria and standards:
  - 5.1 Check (also Detect, Monitor);
  - 5.2 Criticize (also Judge).
6. Create – Put elements together to form a coherent or functional whole; re-organize elements into a new pattern or structure:
  - 6.1 Generate (also Hypothesize);
  - 6.2 Plan (also Design);
  - 6.3 Produce (also Construct).

## Appendix C Opportunity to learn form (to be completed by teachers)

### Directions for use

The purpose of this form is to find out which questions in a test (generally an end-of-term or end-of-year test) are most appropriate for your students. The question numbers are listed in the first column of the form (column 1), and the question themselves are to be written (or abbreviated) in column 2. For each item, indicate in column 3 whether, during the term or year, you taught or reviewed the knowledge or skill tested by the item. Circle 'YES' if you did or 'NO' if you did not. If you circle 'YES', indicate in column 4 the degree to which you emphasized the knowledge or skill tested in the question noted in column 1. Circle 'much emphasis' (ME), 'some emphasis' (SE), or 'little emphasis' (LE). Finally, if you circle 'NO' in column 3, indicate in column 5 the primary reason why the knowledge or skill was neither taught nor reviewed during the term or year. Circle 'A' if it had been taught previously, circle 'B' if it will be taught later, circle 'C' if it is not in the curriculum at all, or circle 'D' if there was some other reason.

Column 1	Column 2	Column 3			Column 4			Column 5			
1		YES	NO	ME	SE	LE	A	B	C	D	
2		YES	NO	ME	SE	LE	A	B	C	D	
3		YES	NO	ME	SE	LE	A	B	C	D	
4		YES	NO	ME	SE	LE	A	B	C	D	
5		YES	NO	ME	SE	LE	A	B	C	D	
6		YES	NO	ME	SE	LE	A	B	C	D	
7		YES	NO	ME	SE	LE	A	B	C	D	
8		YES	NO	ME	SE	LE	A	B	C	D	

9	YES	NO	ME	SE	LE	A	B	C	D
10	YES	NO	ME	SE	LE	A	B	C	D
11	YES	NO	ME	SE	LE	A	B	C	D
12	YES	NO	ME	SE	LE	A	B	C	D
13	YES	NO	ME	SE	LE	A	B	C	D
14	YES	NO	ME	SE	LE	A	B	C	D
15	YES	NO	ME	SE	LE	A	B	C	D
16	YES	NO	ME	SE	LE	A	B	C	D
17	YES	NO	ME	SE	LE	A	B	C	D
18	YES	NO	ME	SE	LE	A	B	C	D
19	YES	NO	ME	SE	LE	A	B	C	D
20	YES	NO	ME	SE	LE	A	B	C	D

### *Directions for scoring*

The completed form can be scored in several ways. The simplest way is to count the number of 'YES' responses in column 3 and convert this figure to a percentage of the total of questions noted in column 2. The higher the percentage, the greater the OTL. A somewhat more complicated scoring procedure involves column 3 and column 4. Each 'NO' response in column 3 is given one point. Each 'LE' response in column 4 is given two points. Each 'SE' response in column 3 is given three points. Finally, each 'ME' response in column 4 is given four points. The points given to each item are then summarized to produce a total. Again, the higher the total, the greater the OTL. A third method of scoring involves combining column 3 with column 5. A 'YES' response in column 3 is worth three points. An 'A' response in column 5 is worth two points. Any other response in column 5 (e.g. B, C, D) is worth one point. Again, a total score is calculated, the higher total scores indicating greater OTL.

## Appendix D Check-lists for teaching different types of standards

### *Teaching remembering factual knowledge*

Students' attention is focused on the most important factual knowledge.	
Students are provided with memory aids or strategies.	
Important factual knowledge is reviewed from time to time.	

### *Teaching understanding conceptual knowledge*

Defining characteristics or features are identified and emphasized.	
Examples, non-examples and near examples are presented.	
Concepts are taught in relation to one another, rather than in isolation.	

### *Teaching applying procedural knowledge*

Procedure is presented visually to emphasize the 'procedure as a whole'.	
Worked-out examples are used to focus on the application of different steps.	
Sufficient guided and independent practice opportunities are presented.	

Note: Examine each learning unit in terms of these practices. Tick (v) the right-hand column to indicate that a particular teaching practice is implemented.

## *Appendix E* Rating scales for classroom physical environment and climate

### *Directions*

At the end of the lesson, take a few minutes to rate each scale in terms of its presence in the classroom. If, for example, all materials needed by the students were available for them, then the rating for scale number 3 should be a 5. If, on the other hand, none of the materials needed by the students were readily available, the rating for scale number 3 should be a 1. The remaining three numbers (2, 3 and 4) represent varying degrees of availability.

Scale label	Ratings (1 = low, 5 = high)				
1. Degree of visibility	1	2	3	4	5
2. Suitable traffic patterns	1	2	3	4	5
3. Materials are readily available	1	2	3	4	5
4. Conveys the value of the curriculum	1	2	3	4	5
5. Students are task-oriented	1	2	3	4	5
6. Consistently enforces work standards	1	2	3	4	5
7. Relaxed, pleasant atmosphere	1	2	3	4	5
8. Teacher listens to their students	1	2	3	4	5

*Source:* Emmer *et al.*, 1982.

## *Appendix F* Descriptions of rating scales for classroom physical environment and climate

Scale number and name	Description of rating
1. Degree of visibility	Students' desks, chairs and work areas, and any area in which the teacher spends much time (e.g. teacher's desk, audio-visual equipment) are placed in full view of all in the classroom. Rate a 5 if the teacher can see all students and all the students can see the teacher and any relevant instructional displays. Rate a 1 if the degree of visibility is minimal.
2. Suitable traffic patterns	The teacher and students are able to move around the room easily without disrupting each other's work. There are clear pathways to the door, any utilities that may be needed, and major work areas. Required materials and supplies are accessible. The teacher can easily get to each student for individual contact. Rate a 5 if all elements are present in the classroom; rate a 1 if none are present.
3. Materials are readily available	Rate a 5 if all materials and equipment are ready for use on all occasions. Rate a 1 if materials are a significant source of problems (e.g. the teacher continuously runs out of materials, spends a lot of time hunting for them and/or getting them to the pupil, provides written materials that are illegible, has equipment that is unusable because bulbs, batteries or extension cords are missing).
4. Conveys the value of the curriculum	Rate a 5 if the teacher emphasizes the value, usefulness, importance of knowledge and skills included in the curriculum, and creates interest and/or enthusiasm for learning the curriculum. Rate a 1 if all of the above elements are missing.

Scale number and name	Description of rating
5. Students are task-oriented	Rate a 5 if students support and demonstrate enthusiasm for activities and assignments, and seem eager to participate. Rate a 3 if students appear to be accepting and willing, but not enthusiastic. Rate a 1 if students show resistance, complain, and/or avoid engaging in assigned tasks.
6. Consistently enforces standards	Rate a 5 if all students are expected to work to achieve the standards, and the teacher does not give up on or expect lower quality work from some students. Rate a 1 if poor quality work is accepted and/or deadlines for completing the work are ignored or frequently extended.
7. Relaxed, pleasant atmosphere	Rate a 5 if there is a good relationship between the teacher and the students. There is no friction, tension or antagonism; all behave in a friendly and courteous manner. The teacher and students obviously like each other. Students like and/or respect one another. Rate a 1 if all elements are missing.
8. Teachers listen to their students	Rate a 5 if the teacher shows evidence that he/she is listening to the students, such as eye contact, appropriate verbal statements or questions (“Can you tell me more?”, or “You seem upset”), gestures (e.g. nodding) or physical orientation towards the student, and appropriate silence (not interrupting or cutting off the student). Such behaviour communicates attention, acceptance and encouragement. Rate a 1 if the teacher exhibits behaviours that discourage students from talking or which denigrate the student.

## *Appendix G* Powerful learning environment rating scales

School / Teacher \_\_\_\_\_ Grade \_\_\_\_\_ Subject \_\_\_\_\_

Classroom dimension	Rating			
1. Mutual respect	1	2	3	4
2. Diversity	1	2	3	4
3. Behavioural self-control	1	2	3	4
4. Authenticity	1	2	3	4
5. Integrated curriculum	1	2	3	4
6. Instruction as dialogue	1	2	3	4
7. Inclusive instruction	1	2	3	4
8. Active knowledge construction	1	2	3	4
9. Meaningful learning	1	2	3	4
10. Connectedness	1	2	3	4
11. Understanding students	1	2	3	4
12. Teachers as learning leaders	1	2	3	4
13. Involvement in learning	1	2	3	4
14. Co-operation	1	2	3	4
15. Empowerment	1	2	3	4

*Directions*

Think back over your lesson and rate each of the dimensions on a scale from 1-4 as follows:

- Circle a 1 if there was no evidence that the component was in place or if the evidence was negative (e.g. public humiliation of a student is a negative example of mutual respect).
- Circle a 4 if there was substantial evidence that the component was an integral part of the classroom culture.
- Circle a 2 or 3 if the evidence suggests a position between these two extremes. Choose the number closest to the appropriate end of the continuum.

## *Appendix H* Description of components of a powerful learning environment

**Mutual respect** – Mutual respect is evidenced by the way in which people treat one another. There is genuine politeness and concern for the welfare of all. Learning achievements are shared and applauded. In contrast, a lack of mutual respect is indicated by attempts to embarrass others, the use of public threats or humiliation, name calling, or merely by ignoring one another.

**Diversity** – There are many kinds of diversity in classrooms (e.g. age, physical size, academic ability, motivation, oral fluency, gender, race and social class). In the classroom, diversity is something to be embraced and built upon. Using diversity as a resource and allowing for differences of opinion are examples of building on diversity. Separating students on the basis of social class or racial differences is a negative instance; celebrating only one cultural background and humiliating a student because he or she is ‘different’ are also negative examples.

**Behavioural self-control** – Behavioural self-control is evident when students know how to behave and behave appropriately with a modicum of teacher intervention. They are able to work out minor disputes on their own. They can engage in meaningful conversation without the formalities of raising their hand or waiting their turn. In contrast, behavioural self-control is compromised when teachers constantly control student behaviour, providing few, if any, opportunities for students to develop a sense of responsibility for their own behaviour.

**Authenticity** – In order to be authentic, the curriculum must be simultaneously linked to: (a) the world outside of the classroom; and (b) what students already know and can do. These two conditions define what it means to be authentic. Non-authentic curricula, on the other hand, tend to de-contextualize learning, both in terms of its external applicability and its relation with prior knowledge.

**Integrated curriculum** – Curriculum integration refers to ‘pulling together’ two or more subject-matters. Typical examples include social studies and language, science and mathematics, and art and literature. The opposite of an integrated curriculum is a ‘subject-specific’ curriculum, where all learning is ‘nested’ within a specific subject-matter. Typically, each subject is allocated a specific time block in the daily and weekly schedule.

**Instruction as dialogue** – A classroom dialogue can be described as an academic conversation. There is a certain ‘give and take’ in the verbal exchange between teachers and students (and occasionally among the students themselves) and a conversational tone is adopted. Both teachers and students ask questions and share ideas and perspectives. The opposite of a dialogue is a monologue, in which the teacher does most (if not all) of the talking while the students’ oral participation is limited to fairly brief responses to teachers’ questions.

**Inclusive instruction** – Inclusive instruction means that the instruction is structured in such a way as to engage all the learners. All the students participate in activities, all have access to materials and equipment, and all have opportunities to answer questions. Non-inclusive instruction is characterized by fewer learning opportunities for some students. Pull-out programmes for students with special needs and homogeneous grouping restrict inclusiveness.

**Active knowledge construction** – In accordance with an extensive body of cognitive psychological research, students should be provided opportunities to construct their own knowledge. Examples of such opportunities include the use of ‘hands-on’ materials as well as hypothesis formulation and testing. Students are engaged in experimentation, exploration and discovery. The opposite of active knowledge construction is ‘passive knowledge reception’, in which students are regarded as empty vessels that need to be filled.

**Meaningful learning** – This component is closely related to the previous one. Here, the emphasis is on making sense of things – developing an understanding of the materials being presented, explored or discussed. Meaningful learning emphasizes that knowing how to

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find the answer is as important as the answer itself. Meaningful learning is more likely to occur when what is 'to be learned' is related to what is 'already known'. The opposite of meaningful learning is rote learning of decontextualized facts.

**Connectedness** – Whereas curriculum integration emphasizes linkages between subject-matters, connectedness refers to linkages within subject-matters. In mathematics, emphasizing the relations among the major operations (e.g. multiplication as repeated addition) helps students to focus on connections. Seeing similarities as well as differences between nouns and verbs, adjectives and adverbs, and so on also helps form connections. The opposite of connected is separate and discrete.

**Understanding students** – Understanding students involves knowing something about their lives outside of school and knowing something about who they are and how they typically behave. Understanding students also involves knowing what they know and understand, and what they do not. The opposite of understanding students is treating all students as if they were identical in terms of ability and character, or to stereotype them based on race, class, gender or ability.

**Learning leaders** – First and foremost, teachers are teachers. However, they are also learners. By communicating enthusiasm for various subjects and by modelling how to go about solving problems, teachers are, in fact, learning leaders. Teachers who are always right and never make mistakes are less likely to be regarded by their students as learning leaders.

**Involvement in learning** – Involvement in learning is composed of two dimensions. The first is an 'active-passive' dimension; i.e. involvement is active. The second dimension is the extent of this involvement. Involvement must be sustained over some period of time if learning is to occur. Students who are passive and/or easily distracted are not truly involved in learning.

**Co-operation** – Co-operation is the ability to work well with others. Sometimes this means simply complying with the teacher's

requests. At other times this means working collaboratively with classmates on a group project. In terms of relationships with other students, co-operation means making joint decisions, seeking and providing assistance, and participating as a member of a group. A lack of co-operation is evident in some highly competitive students, as well as in those who sabotage or 'actively disengage' from classroom work.

**Empowerment** – Learning is empowering; that is, it allows you to know and do other things. How do teachers go about empowering their students? As a starting point, teachers must relinquish some of their control over the teaching and learning process. More importantly, however, students must see for themselves that they can use tools and strategies learned at one point in time to aid in their future learning. Finally, students must come to accept responsibility for their own learning. Empowerment is not likely to exist in situations where teachers control all aspects of the learning process and when students resist taking an active role in learning.

*Source: Finnan et al., 2003.*

## Appendix I Rating scales for effective classroom management

### Directions

Take a few minutes to rate each scale in terms of its presence in the classroom. If, for example, the administrative routines used by the teacher were quite efficient (that is, they were well organized and required very little time to complete), the rating on scale 1 should be a 5. If, on the other hand, the administrative routines were time consuming to the point that they interfered with learning, the rating on scale 1 should be a 1. The remaining three numbers (2, 3 and 4) represent varying degrees of efficiency.

Scale label	Rating (1 = low, 5 = high)				
1. Efficient administrative routines	1	2	3	4	5
2. Appropriate classroom procedures	1	2	3	4	5
3. Efficient opening/closing routines	1	2	3	4	5
4. Appropriate pacing of lessons	1	2	3	4	5
5. Efficient small group procedures	1	2	3	4	5
6. Manages interruptions	1	2	3	4	5
7. Consistently manages behaviour	1	2	3	4	5
8. Stops misbehaviour promptly	1	2	3	4	5

Source: Emmer *et al.*, 1982.

## Appendix J Descriptions of rating scales for classroom management

Scale number and name	Description of rating
1. Efficient administrative routines	These routines include attendance checks, record keeping and maintenance of files. Rate a 5 if the teacher has routines which minimize the amount of time given to administrative tasks during instructional periods. Rate a 1 if much time is lost to administrative matters.
2. Appropriate classroom procedures	Classroom procedures include those for entering and leaving the room, using equipment and materials, moving around the room, receiving permission to talk or ask questions (e.g. raising hands), and handing in assigned work. Rate a 5 only if adequate procedures are practiced for all of these elements. Rate a 3 if inefficient or poor procedures are implemented for a few key elements. Rate a 1 if many elements have no procedure or if the procedures are not appropriate (that is if they are not effective, or they cause confusion or loss of time).
3. Efficient opening and closing routines	Opening and closing routines include short academic review activities (warm-ups), recording the day's assignments, making announcements, straightening desks and tables, returning equipment and supplies to their allocated place, and tidying up the room. Rate a 5 if opening and closing routines are well established and the beginning and end of the class period proceed smoothly and efficiently. Rate a 1 if no opening and closing routines are apparent (that is, the period begins and ends with confusion or wasted time).
4. Appropriate pacing of lessons	Rate a 5 if the lesson proceeds without frequent interruptions, false starts or backtracking, and if the teacher avoids spending too much time on one aspect of the lesson and hurrying through the rest. Rate a 1 if the pacing is too fast or too slow.

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Scale number and name	Description of rating
5. Efficient small group procedures	Rate a 5 if assignments for each group within the classroom are clear and appropriate, if the required equipment and materials are available, and if procedures have been established for students outside the group with which the teacher is working to get help or assistance. Rate a 1 if all three elements (assignments, equipment/materials, help/assistance) are missing. If small groups are not formed, omit this rating scale.
6. Manages interruptions	An interruption is an event that occurs in the classroom environment distracting the class and/or the teacher. When an interruption occurs, rate a 5 if the teacher handles it in such a way as to minimize its interference with the instruction he/she is giving (that is, students continue with their work and wait quietly for the interruption to pass). Rate a 1 if the interruption severely disrupts the instruction being given. If no interruptions occur, omit this scale.
7. Consistency in managing behaviour	Rate a 5 if the teacher is highly consistent in his/her responses to appropriate and inappropriate behaviour from different students and at different times. Rate a 1 if the teacher is very inconsistent in his or her responses. For example, the teacher allows a certain behaviour on one occasion and disapproves of it on another, or the teacher frequently allows deviations from stated rules or established procedures or routines.
8. Stops misbehaviour	If a student misbehaves, rate a 5 if it is dealt with promptly without involving other students or without causing great interruption to the lesson's activities, with a rapid return to normality. Rate 1 if the misbehaviour disrupts the entire class or if much instructional time is lost. If no misbehaviour occurs, omit this rating scale.

## *Appendix K* Teacher check-list for stages of a lesson

### *Directions*

Reflect back on the past several weeks of teaching and respond to the following statements. The majority of the statements require that you consider how often, on average, you engage in particular activities. The final question asks you whether you do or do not engage in the activity.

1. I make sure that the students are aware of the purpose(s), goal(s) or objective(s) of the lesson, and that they have some level of understanding of the necessity or importance of the lesson in the large scheme of things.

four or five times a week  
 three times a week  
 once or twice a week  
 rarely, if ever

2. At the beginning of the lesson, I conduct a brief review of the knowledge and skills included in the previous lesson that are associated with, or necessary for, learning the knowledge and skills taught during the lesson.

four or five times a week  
 three times a week  
 once or twice a week  
 rarely, if ever

3. I pose questions, problems or puzzles that the students must solve in their heads (that is, without the aid of books, paper and pencils) at the beginning of the lesson and throughout the lesson as appropriate.

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- four or five times a week
- three times a week
- once or twice a week
- rarely, if ever

4. When engaged in whole class instruction, I spend a substantial proportion of the lesson (at least one-third of lesson time) presenting or discussing with the students the key facts, concepts and procedures related to the lesson's objective(s).

- four or five times a week
- three times a week
- once or twice a week
- rarely, if ever

5. When co-operative learning is used, I make sure that the students have been given assignments that require them to work co-operatively, that they understand the need to be responsible for the group and accountable for individual progress, and are able to work well with others in the group.

- four or five times a week
- three times a week
- once or twice a week
- rarely, if ever

6. During presentations, I use examples to help the students understand abstract concepts and ideas, and I use demonstrations to show them how to apply procedures.

- four or five times a week
- three times a week
- once or twice a week
- rarely, if ever

7. I provide opportunities for the students to work with new concepts or practice newly acquired procedures under my supervision (or the supervision of their peers) before I allow them to work or practice on their own.

- four or five times a week
- three times a week
- once or twice a week
- rarely, if ever

8. I provide opportunities for the students to work with new concepts or put into practice their knowledge or newly acquired procedures, either in the classroom or at home.

- four or five times a week
- three times a week
- once or twice a week
- rarely, if ever

9. I periodically conduct lessons which review large amounts of previously taught material (e.g. that taught during an entire unit or term).

- yes
- no

Source: Adapted from Good and Grouws, 1979.

## Appendix L Rubrics for assessing the quality of lesson delivery

Element	Unsatisfactory	Satisfactory	Excellent	Superior
Connecting lessons with prior knowledge and experience.	No attempt is made to open the lesson by making connections.	Lessons are opened with questions to elicit the students' prior knowledge and experience. Some connections are made to lesson objectives.	Lessons are opened with activities and questions to help the students to make connections between what they already know and the lesson objectives.	Lessons are opened with questions and activities that help the students to make connections. Adjustments are made to ensure that connections are apparent.
Using instruction in a time-effective manner.	The students have either too much or too little time and are constantly off-task with too much wasted time.	Sufficient time is provided for the students to complete learning activities; strategies are used to pace and adjust instruction to ensure continual engagement.	Instruction is paced to include periodic review and closure to connect lessons. Transactions are efficient and integrated into the learning activities.	Instruction is presented, adjusted and facilitated in such a way that the students are given sufficient time for learning, are continually engaged, and have opportunities for assessment and reflection.
Developing and sequencing instructional activities.	Lesson development addresses a specific objective using available resources.	Lesson development focuses on a series of interconnected lessons with emphasis on interrelated objectives.	Lesson development emphasizes an increase in subject-matter complexity, building on previous learning.	Lesson development helps the students integrate and apply knowledge, making connections within and across subject-matter areas.

Element	Unsatisfactory	Satisfactory	Excellent	Superior
Pedagogical content knowledge is demonstrated.	Content errors are made or content errors made by the students are not corrected.	The teacher displays basic content knowledge but does not recognize or anticipate student misconceptions.	The teacher displays in-depth content knowledge and recognizes, but does not anticipate, misconceptions.	The teacher displays extensive content knowledge, recognizes and anticipates misconceptions.
The teacher actively engages the students through questioning and discussion.	Questions are non-existent or of poor quality; virtually no discussion takes place.	Questions are of uneven quality, and are not conducive to facilitating discussion.	Questions are consistently of high quality and are effective in developing discussions.	Questions are consistently of high quality and the students formulate many questions as well; good discussions are brought up, in which most students participate.
Instruction is modified accordingly to accommodate the students' learning needs.	Lessons are followed as planned.	Lessons are adjusted based on information assessment of the students' understanding, taking note of confusion amongst students.	Assessments are used to inform of modifications (in terms of additional time or different activities and instructional strategies of lessons) in advance.	Assessments are used to make modifications both within and between-lessons; student self-assessment is employed to inform of modification decisions.
Prompt and appropriate feedback is provided.	Feedback is not provided or is consistently of poor quality.	Feedback is inconsistent.	Feedback is consistently of high quality and timely.	Feedback is consistently of high quality, and provisions are made for the students to use feedback in their learning.

Sources: Adapted from Moir *et al.*, 2002; Oswego City School District, 2000.

## Appendix M Classroom communication form

### Directions

After observing the lesson, take a few minutes to rate the teacher on each of the following indicators of effective communication. Circle 5 if you would rate yourself as excellent, and 1 if you would rate yourself as poor. Circle the numbers in between (that is 2, 3 and 4) to reflect different points in the “Poor” to “Excellent” continuum.

**The teacher:** \_\_\_\_\_

Indicator	Rating (1 = low; 5 = high)				
1. Provided an overview of the lesson	1	2	3	4	5
2. Was 'reasonably redundant'	1	2	3	4	5
3. Avoided digressions; remained focused on the topic	1	2	3	4	5
4. Checked for students' understanding	1	2	3	4	5
5. Included many and varied examples	1	2	3	4	5
6. Used verbal markers	1	2	3	4	5
7. Used precise language	1	2	3	4	5
8. Used metaphors, analogies, etc.	1	2	3	4	5
9. Combined showing and telling effectively	1	2	3	4	5
10. Applied questioning techniques appropriately	1	2	3	4	5
11. Provided feedback and praised students appropriately	1	2	3	4	5
12. Dealt appropriately with incorrect, incomplete or lack of responses	1	2	3	4	5

## Appendix N The clear teacher check-list

### Directions for students

As your teacher, I hope I explain things clearly, but I may not always do so. In order to improve in this area, I need your help. Read each statement below and circle the letter that indicates how often I do each of the items listed. “A” means always, “M” means most times, “S” means sometimes, “N” means never. If you don’t know or have no opinion, circle “DK” (for “don’t know”).

#### As our teacher, you:

Indicator	Rating				
1. Give explanations we understand	A	M	S	N	DK
2. Teach step by step	A	M	S	N	DK
3. Describe the work to be done and how to do it	A	M	S	N	DK
4. Explain something and then show us an example	A	M	S	N	DK
5. Explain something and then stop so that we can ask questions	A	M	S	N	DK
6. Give us a chance to think about what you are teaching us	A	M	S	N	DK
7. Emphasize difficult points	A	M	S	N	DK
8. Answer our questions	A	M	S	N	DK
9. Ask questions to find out if we understand	A	M	S	N	DK
10. Show us the differences between two or several things	A	M	S	N	DK

Source: Adapted from Kennedy *et al.*, 1978.

## Appendix O Academic work check-list

### Directions

Select an assignment which was given to students in a class. Analyze the assignment in terms of the following seven questions. The greater the number of “NO” and “NOT SURE” responses, the lower the quality of the assignment. Relevant comments pertaining to each question can be made at the bottom of this check-list, on the reverse side, or on attached sheets of blank paper.

1. Is the objective to which the assignment is related clearly understood by the students? That is, do students know what they are learning by completing the assignment?	YES	NO	NOT SURE
2. Is completion of the assignment likely to result in students' improved learning relative to the objective?	YES	NO	NOT SURE
3. Is the assignment presented in an organized manner that enhances students' completion of it in a way that facilitates desired learning?	YES	NO	NOT SURE
4. Are directions for completing the assignment clearly stated, preferably in writing? That is, do students know how they are to complete it?	YES	NO	NOT SURE
5. Are the criteria and standards used to assess the quality of the work explicit and clear? That is, do students know how their work is to be evaluated?	YES	NO	NOT SURE
6. Is the length of the assignment reasonable in view of the intended purpose and allocated time?	YES	NO	NOT SURE
7. Is the type or format of the work familiar to the students? If not, additional explanation might be needed.	YES	NO	NOT SURE

### Comments \_\_\_\_\_

\_\_\_\_\_

## Appendix P The student involvement check-list

### Directions

Read each statement below, thinking back over today's lesson. If you agree that that statement expresses something that you thought or did during the lesson, circle "YES". If it does not, circle "NO".

Statement	Response	
1. I paid attention for almost the entirety of the lesson today.	YES	NO
2. If I didn't understand something, I just gave up.	YES	NO
3. I tried very hard to learn what the teacher was teaching.	YES	NO
4. Nothing we talked about seemed to make sense to me.	YES	NO
5. I tried to connect what we were learning to what I already knew.	YES	NO
6. During class, my mind often wandered.	YES	NO
7. I think I could explain what I learned today to other students.	YES	NO
8. I had trouble understanding what we were talking about.	YES	NO

Note on scoring: For odd-numbered statements, 'YES' responses are worth 1 point, whereas 'NO' responses are worth 0 points. For even-numbered statements, the reverse is the case. The total number of points is computed and the higher the total score, the greater the student involvement.

Source: Adapted from Hecht, 1978.

## *Appendix Q* The Individual Activity Record (IAR)

### *Directions*

Observers using the IAR have three primary tasks to complete. The first is the selection of eight students who will be observed during the lesson. These students should be selected to represent the diversity of the students in the classroom as much as possible. In the space next to each student's number, the observer can note the characteristics of the student (e.g. where the student is sitting, what the student is wearing, whether the student is a boy or girl, tall or short) that will help the observer remember each student.

The second task is to observe all eight identified students on five separate occasions during the lesson (once at the beginning, three times during the middle, and once near the end). On the IAR, these occasions are labelled 'Time 1', 'Time 2', 'Time 3', 'Time 4' and 'Time 5'. During each occasion, each student is observed for approximately 10 seconds.

The third task is to record what is seen and heard as each student is being observed. Specifically, the observer is expected to note: (1) the activity in which the student is participating or expected to participate; (2) whether or not the student is actually engaged in the activity; and (3) the relationship between the teacher and that particular student. During whole class instruction, the student is considered part of the class and for the third observation (3), the focus is on the relationship between the teacher and the class. The codes for Activity (A), Engagement (E) and Relationship (R) are listed at the bottom of the IAR.

The numbers corresponding to these Activity, Engagement, and Relationship codes are placed in the appropriate column of the IAR. If, during the first time period, student number 1 was paying attention while the teacher was explaining something to the whole class, the

code for Time 1 for this student would be 01 in column A (listening to the lecture/explanation/recitation/demonstration), 1 in column E (engaged in learning), and 1 in column R (teacher interacting with students). If, during the fifth time period, this same student was staring into space while his/her classmates were reading silently in their seats and the teacher was talking quietly to one of the other students, the code for Time 5 for student No. 1 would be 06 in column A (seatwork: reading silently), 0 in column E (not engaged in learning), and 3 in column R (teacher uninvolved with student). The 3 in column R means that the teacher is not involved with the student being observed.

## Appendices

Observer name \_\_\_\_\_ Observation date and time \_\_\_\_\_

Teacher name \_\_\_\_\_ School name \_\_\_\_\_

Student ID number and descriptors	Time 1	Time 2	Time 3	Time 4	Time 5
No. 1	A E R	A E R	A E R	A E R	A E R
No. 2					
No. 3					
No. 4					
No. 5					
No. 6					
No. 7					
No. 8					

A: 01 Listening to lecture/explanation/recitation/demonstration  
 E: 1 Student engaged  
 E: 0 Student not engaged

A: 02 Reviewing previous content

A: 03 Participating in discussion/discourse  
 R: 1 Teacher interacting

A: 04 Participating in oral practice/drill  
 R: 2 Teacher monitoring/supervising

A: 05 Seatwork: taking a test  
 R: 3 Teacher uninvolved with student

A: 06 Seatwork: reading silently

A: 07 Seatwork: written assignments

A: 08 Seatwork: laboratory/manipulative

A: 09 Non-academic management (transition, procedural, social, discipline)

## *Appendix R* Indicators included on the Dutch Inspectorate's Observation Instrument

- A. Is the school climate safe and supportive?
  - 1. Is the learning environment orderly and functional?
  - 2. Does the teacher respect the pupils?
  - 3. Does the teacher promote mutual respect among pupils?
  - 4. Does the school climate promote the self-confidence of pupils?
  - 5. Does the teacher ensure structure within the groups?
  
- B. Is the teaching-learning climate stimulating for the pupils?
  - 6. Does the teacher ensure a stimulating teaching-learning climate?
  - 7. Does the teacher encourage independent learning?
  
- C. Is the instruction given clear and distinct?
  - 8. Do the lessons have a distinct structure?
  - 9. Is the lesson material clearly explained?
  - 10. Does the teacher check that pupils have understood the lesson material?
  
- D. Are pupils encouraged into action?
  - 11. Does the teacher stimulate pupils to take an active part in the lesson?
  - 12. Does the teacher use teaching methods that require action on the part of the pupils?
  - 13. Does the teacher promote partnerships and co-operation between pupils?
  - 14. Do pupils show involvement during the lesson?

## *Appendices*

- E. Is attention given to the use of learning strategies?
  - 15. Does the teacher make use of situations recognizable to the pupils?
  - 16. Is attention given to thinking and learning strategies?
  - 17. Is focus put on self-monitoring?
  
- F. Are differences between pupils taken into account?
  - 18. Does the teacher adapt his/her teaching to the capabilities of the class?
  - 19. Are differences between pupils taken into account when instructions are given?
  - 20. Are differences between pupils taken into account when assimilating the lesson?
  - 21. Does the teacher adjust his/her use of language to the pupils?
  
- G. Is the classroom management effective?
  - 22. Is the classroom organization effective?
  - 23. Is the lesson time spent efficiently?

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